

*Governing Iowa's public
universities and special schools*

University of Iowa
Iowa State University
University of Northern Iowa
Iowa School for the Deaf
Iowa Braille and Sight Saving School
Lakeside Lab Regents Resource Center
Quad-Cities Graduate Center
Southwest Iowa Regents Resource Center
Tri-State Graduate Center



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STATE OF IOWA

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January 14, 2013

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Des Moines IA 50319

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Des Moines IA 50319

Holly Lyons, Division Director
Legislative Services Agency
State Capitol Building
Des Moines IA 50319

Re: Economic Development and Technology Transfer Report

Dear Members of the Iowa General Assembly:

Pursuant to Iowa Code and 2011 Iowa Acts, the enclosed annual report includes information from the University of Iowa, Iowa State University, the University of Northern Iowa, and their respective research foundations as follows:

Iowa Code §262B.3(3)

Patents and Licenses

2011 Iowa Acts, Chapter 130 §60

Progress of Regents Institutions on Technology
Transfer and Economic Development

If there are any questions concerning this report, please do not hesitate to contact us.

Sincerely,

Robert Donley

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Enclosures

cc: Ron Robinson
Legislative Liaisons
Legislative Log

Contact: Ann McCarthy

2012 ECONOMIC DEVELOPMENT AND TECHNOLOGY TRANSFER REPORT

Actions Requested: Consider recommending the following to the Board:

- 1) Receive the report.
- 2) Direct that this report and copies of complete institutional reports be forwarded to the Secretary of Senate, the Chief Clerk of the House of Representatives, the Legislative Services Agency, and the Office of the Governor and the Director of the Iowa Department of Economic Development pursuant to Iowa Code Chapters 262B.3, HF 809 (2005 Session) and HF 2459 (2006 Session).

Executive Summary:

The Regents universities promote the economy of Iowa most notably by providing higher education to the people of the state. The universities also make a significant contribution to the Iowa economy by conducting academic research that results in intellectual property and applications available to the marketplace and by providing expertise and assistance directly to Iowa's people, industry and communities. The University of Iowa (SUI), Iowa State University (ISU) and the University of Northern Iowa (UNI) thus support the economy of Iowa primarily through their core missions, and their economic contributions to the state are fundamentally linked to their overall academic excellence.

This core mission was supported by \$841.3 million in funding sponsored by federal and corporate sources in FY 2012. This funding provided the basis on which the Regents universities conducted a wide variety of economic development programs that produced the following results in the past year:

- 213 new intellectual property disclosures
- 179 patent applications
- 77 new patents awarded
- 74 new license and option agreements on intellectual property
- 292 total license and option agreements yielding income
- \$17.2 million in royalty and fee income
- \$105.8 million in revenue generated by Iowa companies as a direct result of university technologies
- 2,933 Iowans employed at 124 companies at the SUI, ISU and UNI research parks and incubators

State funding of ongoing economic development programs at the universities has declined by 53.7% comparing FY 2002 to FY 2012. Grow Iowa Values Fund appropriations to the universities in FY 2012 were reduced to \$1.5 million are 70% lower than the original FY 2005 authorization.

Selected FY 2012 Economic Development and Technology Transfer Highlights

University of Iowa:

- The University of Iowa Research Foundation (UIRF) executed 3 option and license agreements to startups based on UI intellectual property in FY 2012. In the past 5 years, UIRF has executed a total of 22 licenses and options with 17 startups based on UI technologies. Of those 17 companies, 15 are still in operation. In FY 2012, the funding and financing of UI startups was over \$40M. In 2012, UIRF focused on increasing the disclosure rate and pipeline. Also in 2012, UIRF disclosures reached an all-time high, with a 45% increase over the 2008-2011 levels.

- The Iowa Medical Innovation Group (IMIG) is a unique student-led program that focuses on identification of solutions to clinical problems through collaborations in the Colleges of Medicine, Engineering, Business and Law. Students work on creating medical devices and/or Health IT solutions with the assistance of staff from JPEC and the UIRF. To date, over 40 interesting technologies have been identified and reviewed and 2 are currently moving forward in advanced phases of development in anticipation of forming startup companies. This program, now in only its 3rd year, has attracted more than 74 students who meet weekly with faculty, staff and external business mentors.
- The UI Research Park (UIRP) companies and affiliated labs report 1,812 employees living in 169 communities in 50 Iowa counties, a regional labor shed covering almost one-half of the state. Average individual salary of \$62,000 which translates into an annual payroll of nearly \$112 million, resulting in an estimated \$7.0 million in state income taxes in 2012.
- BioVentures Center at the Research Park currently has 11 resident companies, who employ 75 people, and have leased 11 of the 20 laboratories in this facility to startup companies. The eleven companies occupy 11 laboratories and 23 offices in BVC, accounting for 74% of leasable space.

Iowa State University:

- The ISU Research Park continues to be successful in initiating as well as nurturing numerous new businesses. Eight new companies and affiliates joined the Park in FY 2012, bringing the historical total to 218 companies, research centers, and affiliates. Currently, there are 76 companies, research centers, and affiliates located in the Park, employing 1,200 people.
- Companies receiving technical assistance from ISU's Institute for Physical Research and Technology reported that the estimated impact of projects conducted over the last 3 years is \$9.9 million per year. Companies also estimated over 18 jobs were created or retained each year from 2005-2011.
- In FY 2012, 1,372 businesses from 97 counties in the state received assistance on projects or attended educational workshops from ISU Extension and Outreach's Center for Industrial Research and Service staff or partners. Companies responding to surveys reported \$46 million in new investments, \$16 million in costs saved or avoided, and \$352 million in sales gained or retained. Company executives stated that 5,667 jobs were added or retained as a result of the assistance they received from CIRAS and partners.
- The Small Business Development Center (SBDC) provided business assistance to companies, involving 2,695 clients and 11,259 counseling hours. They also conducted 232 training workshops in which 3,727 individuals participated.

University of Northern Iowa:

- UNI provided service in all 99 counties to nearly 885 unique business, community and local government clients; another 10,900 individuals were engaged in the MyEntre.Net entrepreneurial support system.

- UNI involved 202 faculty members and more than 2,400 students in the delivery of these services.
- UNI's three incubator/accelerators programs and MyEntre.Net helped start or expand 266 business ventures creating 481 FTE jobs.
- 22 student businesses were tenants in the John Pappajohn Entrepreneurial Center's Student Business Incubator and 41 additional student entrepreneurs were assisted by the affiliate program.

Engagement

Many organizational units at the Regents universities are engaged with Iowa's people, industry and communities for the promotion of the state's economic development. Key economic development efforts include: research, intellectual property development and technology transfer, business incubation and acceleration, direct technical assistance to local and regional economic development groups, technical assistance and counseling to businesses, market research for Iowa companies and attracting and retaining businesses in the state. These activities are also highly coordinated with the economic development efforts of the Governor, the Iowa General Assembly and state agencies including the Iowa Department of Economic Development.

State Funding for Economic Development and Technology Transfer

State funding in FY2012 was provided in two primary economic development program areas:

1. Ongoing Economic Development and Technology Transfer Programs: FY 2012 \$3.21 million

In FY 2012, the state provided \$3.21 million for several ongoing programs which include the research parks at SUI and ISU, the Institute for Physical Research and Technology, the Small Business Development Centers, the Institute for Decision Making, the Metal Casting Center and the Center for Advanced Drug Development. For FY 2013, state support for these programs remained level funded at \$3.21 million. Total state support for these programs now stands at \$3.21 million for FY 2013. This is a decline of 53.7% below the \$7.63 million provided in FY 2002.

2. Grow Iowa Values Fund (GIVF): FY 2012 \$1.5 million

In FY 2005, the General Assembly authorized a ten-year annual appropriation of \$5 million under the GIVF to the Regents universities for purposes of supporting the human and physical infrastructure needed to effectively develop and transfer technology discoveries and to fund development projects involving existing companies and start ups.

Many of the GIVF-funded projects involve multi-year research and development efforts with private companies. A number of projects funded in earlier years are now being completed and are demonstrating a significant impact on job and wealth creation.

For FY 2012 the General Assembly approved \$1.5 million in GIVF funding, of which \$1.44 million was allocated for the three universities and \$60,000 was allocated for projects submitted by Iowa's independent colleges and universities. The FY 2013 GIVF appropriation was increased to \$3 million and renamed the Regents' Innovation Fund. The Board of Regents approved the universities' FY 2013 Regents Innovations Fund proposals at the August 2012 Board meeting. The universities and companies involved in GIVF projects have identified matching funds for the projects.

Examples of projects included:

- IDx was provided GIVF proof of concept funding in 2007 by the University of Iowa. IDx is a medical instrument and software company that provides computerized automated detection of diabetic retinopathy, risks of cardiovascular disease, and infections. IDx has seven patented algorithms (3 granted and 4 pending) that read digital photos of the retina within seconds. These algorithms have been found to be as good as or better than retinal experts. The results have been published widely in peer-reviewed top Ophthalmology journals. In summary, IDx has licensed patented computer reading algorithms that can detect diabetic retinopathy, hypertensive retinopathy and arteriole-venous ratios. These algorithms have been proven in clinical trials of thousands of patients and the results have been published. IDx has almost completed development on a low cost camera which is easy to use to get high quality retinal images. IDx will market the retinal imaging technology to primary care physicians, "minute clinics" and specialists worldwide. The analysis of the retinal images will provide health care providers with important information concerning the best treatment of their patients at a low cost.
- Iowa State professor Hui Hu is collaborating with Goodrich Engine Components Division (GECD) to develop advanced flow diagnostics to quantify the characteristics of spray flows and to elucidate underlying physics of the important processes, such as the breakup of liquid jets and sheets, atomization and evaporation of fuel droplets, and air/fuel mixing in order to assist GECD in developing next generation fuel nozzles for maximized energy efficiency while minimizing pollutant emissions, and maintaining the operability requirements. An advanced multi-functional spray flow diagnostic system, which is composed of high-energy laser system, high-speed imaging system and associated the optics and optic-mechanic devices, has already been developed as a result of this GIVF project. A comprehensive experimental study has been conducted to characterize a fuel injector/atomizer nozzle provided by GECD to assist GECD to develop next generation fuel nozzles/injectors.
- UNI in partnership with the Iowa Partnerships for Economic Progress (IPEP), Regents universities, community colleges, utilities, Professional Developers of Iowa (PDI) and the Iowa Department of Education, IDM strengthened the Business Expansion & Strategic Trends (BEST) of Iowa program. BEST of Iowa supports local economic development organizations in implementing or increasing the effectiveness of their business retention and expansion efforts. BEST initiatives include enhancing statewide coordination of existing industry programs and implementation of the Synchronist Business Information System® at the regional level. Specifically, this project assisted with improving data collection and input at state and regional levels as well as developing a coordinated response to technology transfer issues on behalf of the Regents universities.

Private College Grant Program

Of the \$1.5 million in FY 2012 GIVF funding, \$60,000 was awarded by the Board of Regents to two independent universities and colleges for economic development and technology transfer projects.

- Grand View University received \$50,000 to seek the synthesis of novel oligosaccharide-4 phosphate derivatives which will provide a better understanding of substrate inhibition for glycogen degradation in phosphorylases. It is anticipated that the outcomes of this research will make a substantive contribution to the design of active site inhibitors of phosphorylase *b*. This will

lead to a better understanding of how to design inhibitors to control glycogen degradation and new treatments for diabetes.

- Central College received \$10,000 for a Prairies for Agriculture Project. The goal of the project is to reconstruct an endangered ecosystem in a manner that provides economic opportunities for farmers, ranchers, and other members of the public. The research team will examine and demonstrate the benefits of restoring prairie ecosystems within the agricultural landscape by planting over 375 plots with different combinations of prairie plants. The broad goal of the research is to determine which specific mixes of plants provide the most biomass for fuel/forage production while simultaneously producing the most agricultural and environmental benefits. The research site will also be used for demonstration purposes to educate agricultural producers, business people, government officials and the public on the potential of prairies.

Full Reports Available

The full annual reports from the universities are available at the Board of Regents website and will be provided to the General Assembly, the Governor's Office, the Legislative Services Agency and the Iowa Department of Economic Development.

Indicators	FY 2010				FY 2011				FY 2012			
	ISU	SUI	UNI	Regents Totals	ISU	SUI	UNI	Regents Totals	ISU	SUI	UNI	Regents Total
1. Number of disclosures of intellectual property	111	70	8	189	106	68	8	182	102	102	9	213
2. Number of patent applications filed	26	107	8	141	47	90	5	169	56	116	7	179
3. Number of patents awarded	29	97	3	129	25	43	3	75	16	59	2	77
4. Number of license and option agreements executed on institutional intellectual property in total	97	21	3	121	49	24	2	75	50	21	3	74
5. Number of license and option agreements executed on institutional intellectual property in Iowa	32	6	2	41	19	5	1	25	19	7	3	29
6. Number of license and option agreements yielding income	260	129	11	400	217	94	11	322	188	94	10	292
7. Revenue to Iowa companies as a result of licensed technology ¹	\$58 million	\$2.03 million	\$2.7 million	\$62.7 million	\$86 million	\$1.99 million	\$2.4 million	\$90.4 million	\$101 million	\$2.2 million	\$2.6 million	\$105.8 million
8. Number of startup companies formed, in total (through licensing activities)		3		3*	2	3		5		2		2
9. Number of startup companies formed, in Iowa (through licensing activities)		3		3*	2	3		5		2		2
10. Number of start up companies formed through UNI MyEntrenet/Incubator			72	72*			61	61			73	73
11. Number of companies in research park/incubators	59	46	30	135	57	41	23	121	59	41	24	124

*corrected numbers

Indicators	FY 2010				FY 2011				FY 2012			
	ISU	SUI	UNI	Regents Totals	ISU	SUI	UNI	Regents Totals	ISU	SUI	UNI	Regents Total
12. Number of new companies in research parks and incubators	11	3	11	25	10	2	15	27	8	2	16	26
13. Number of employees in companies in research parks and incubators	758	2010	61	2829	846	1618	45	2509	838	1812	49	2699
14. Royalties and license fee income	\$9.4 million	\$27 million	\$118,849	\$36.52 million	\$11.3 million	\$6.28 million	\$99,074	\$18.57 million	\$9.9 million	\$7.05 million	\$209,823	\$17.16 million
15. Total sponsored funding (\$ million)	\$388.2 million	\$466.5 million	\$42 million	\$896.7 million	\$342.3 million	\$456.5 million	\$43 million	\$841.8 million	\$360.2 million	\$438.1 million	\$43 million	\$841.3 million
16. Corporate-sponsored funding for research and economic development ² in total (\$ million)	\$21.1 million	\$30.8 million	\$1.55 million	\$53.45 million	\$24.9 million	\$44.7 million	\$2.07 million	\$71.7 million	\$23.4 million	\$52.9 million	\$1.27 million	\$77.57 million
17. Corporate-sponsored funding for research and economic development ² in Iowa (\$ million)	\$11 million	\$1.8 million	\$1.55 million	\$14.35 million	\$12 million	\$1.5 million	\$2.07 million	\$15.6 million	\$11 million	\$1.1 million	\$1.27 million	\$13.27 million

¹Aggregate sales reported by Iowa companies of products and services based on licensed inventions.

²Excludes corporate philanthropy

**The University of Iowa
2012 Annual Economic Development Report**

EXECUTIVE SUMMARY

Research drives innovation at The University of Iowa. In FY12, The University of Iowa generated impressive extramural support of \$438.1 million. This outstanding productivity continues to place the UI among the nation's elite public research universities and is especially significant in the face of challenging economic conditions in Iowa. This robust research enterprise and integrated economic development activities at the UI have a significant and far reaching impact on the state of Iowa's economy. The IOWA Centers for Enterprise (ICE) provides infrastructure and services to enhance technology transfer and commercialization of UI technologies, new company formation, support of Iowa companies and workforce development. ICE currently includes the following departments:

- The University of Iowa Research Park (formerly Oakdale Research Park) (UIRP)
- BioVentures Center (BVC) and The Technology Innovation Center (TIC)
- The John Pappajohn Entrepreneurial Center (JPEC)
- The University of Iowa Research Foundation (UIRF)
- The University of Iowa Small Business Development Center (SBDC)

FY12 proved to be an outstanding year for economic development activities at the University of Iowa. Our most notable accomplishments include:

UIRP/BVC/TIC

- The UI Research Park (UIRP) companies and affiliated labs report 1,812 employees living in 169 communities in 50 Iowa counties, a regional labor shed covering almost one-half of the state. Average individual salary of \$62,000 which translates into an annual payroll of nearly \$112 million, resulting in an estimated \$7.0 million in state income taxes in 2012. The BioVentures Center (BVC) currently has 11 tenants and 75 employees, 6 of which are spun from UI technology, for an occupancy rate of 74%. The Technology Innovation Center (TIC) currently houses 9 tenant companies, which employ 26 people, for an occupancy rate of 77%. Since TIC opened in 1989, 23 of the 41 companies affiliated with TIC are still in business in Iowa today.
- The BVC created a shared lab space to assist early-stage SBIR companies, to provide them individual laboratory space at a cost effective rate.
- STEM academy will be located on lots 25 and 26 at the UIRP. UIRP is joint planning for this facility to provide a unique STEM education innovation center which will serve high school students from 7 surrounding school districts through joint UI, Kirkwood and local High School faculty. UIRP will play an important role in workforce development in STEM. In addition, UI is one of six STEM Hubs named by the state in May.
- MediRevv, a revenue cycle management company, opened their new facility on the Park in August 2012. MediRevv will bring approximately 100 jobs to our area. Integrated DNA Technologies (IDT) also expanded their presence on the park by relocating their information technology department to a 26,000 sf building on the UIRP. IDT reported over 450 employees in Iowa for FY12.
- In FY12 we began a roads and sewer project, in collaboration with the City of Coralville. Upon completion of this project, all 15 remaining lots will become Shovel Ready.

JPEC

- In FY12, The University of Iowa's John Pappajohn Entrepreneurial Center (JPEC) and the University of Iowa's Small Business Development Center (SBDC) helped accelerate the growth of 140 new business startups and assisted in the creation of 309 jobs through 9,180+ hours of one-on-one counseling and several entrepreneurial training activities.
- JPEC co-sponsored 11 seed grant competitions, awarding over \$200,000 to 73 start-ups.
- JPEC offers one of the most comprehensive entrepreneurial education and business support programs in the nation. Featured programs supporting economic development in FY12 include:
 - providing business consulting services to small companies located across Iowa through its student field study program (51 companies assisted);
 - hosting/sponsoring elevator pitch and business plan competitions to support innovation and new venture creation (11 competitions held);
 - supporting the creation and launch of student-based business through the Bedell Entrepreneurship Learning Laboratory (17 offices at full capacity, plus 8 businesses on a waitlist);
 - and delivering entrepreneurial education through academic courses across campus and online (101 sections taught on campus and 27 sections taught online), workshops/seminars, lectures (16 workshops held), and high school teacher training and curriculum.
- The Iowa Medical Innovation Group (IMIG) is a unique student-led program that focuses on identification of solutions to clinical problems through collaborations in the Colleges of Medicine, Engineering, Business and Law. Students work on creating medical devices and/or Health IT solutions with the assistance of staff from JPEC and the UIRF. To date, over 40 interesting technologies have been identified and reviewed and 2 are currently moving forward in advanced phases of development in anticipation of forming startup companies. This program, now in only its 3rd year, has attracted more than 74 students who meet weekly with faculty, staff and external business mentors.

UIRF

- The University of Iowa Research Foundation (UIRF) executed 3 option and license agreements to startups based on UI intellectual property in FY12. In the past 5 years, UIRF has executed a total of 22 licenses and options with 17 startups based on UI technologies. Of those 17 companies, 15 are still in operation. In FY12, the funding and financing of UI startups was over \$40M. FY11 funding and financing of these startups was \$33M, \$16M in FY10 and \$7M in FY09.
- In 2012, UIRF focused on increasing the disclosure rate and pipeline. Also in 2012, UIRF disclosures reached an all-time high, with a 45% increase over the 2008-2011 levels.

SBDC

- In FY12, the Small Business Development Center (SBDC) served 354 clients, assisted in 31 business startups, helped clients raise over \$2,580,500 in financing and created 114 jobs.
- SBDC sponsored 8 entrepreneurial training workshops and provided over 1,200 hours of one-on-one counseling.

The following sections of this report will directly respond to specific areas as requested by the Board of Regents. These include: the impact of the University of Iowa activities on the economic growth in Iowa; institutional activities and services that indirectly promote economic development; quantitative information regarding economic development activities in FY12; a summary of outreach and service activities; direct economic development assistance to Iowa communities; summary of Grow Iowa Values Fund (GIVF) expenditures; and emerging trends in the area of economic development.

IMPACT OF ULECONOMIC DEVELOPMENT ACTIVITIES ON THE ECONOMIC GROWTH IN IOWA

Job creation and wealth in Iowa

University of Iowa Research Park (UIRP)

UIRP, formerly known as the Oakdale Research Park & Oakdale Research Campus, is a blended campus consisting of a multitude of commercial ventures and a variety of university academic programs and infrastructure assets. As of June 2012, 7 established companies, 20 startup companies and 6 University anchor laboratories were located in the park. These companies have access to University research infrastructure including internet access and access to libraries and research facilities, and to core facilities to support chemistry, biology, computation and instrumentation. Importantly, companies have access to faculty collaborators and to students as interns or employees. MediRevv, a revenue cycle management company, opened their new facility on the Park in August 2012. MediRevv will bring approximately 100 jobs to our area. Integrated DNA Technologies (IDT) also expanded their presence on the park by relocating their information technology department to a 26,000 sf building on the UI Research Park. IDT reported over 450 employees in Iowa for FY12.

In FY12, the 41 active Iowa companies affiliated with UI Research Park and Technology Innovation Center¹ reported 1,812 employees earning an average salary of \$62,000. The 1,812 employees of companies and laboratories affiliated with the UIRP and TIC reported living in 169 communities in 50 Iowa counties, a regional labor shed covering almost one-half of the state. The annual payroll nears \$112 million, resulting in an estimated \$7.0 million in state income taxes in 2011. The affiliated companies and laboratories also reported employing 34 UI students, and 50 employees had earned doctoral degrees.

BioVentures Center (BVC)

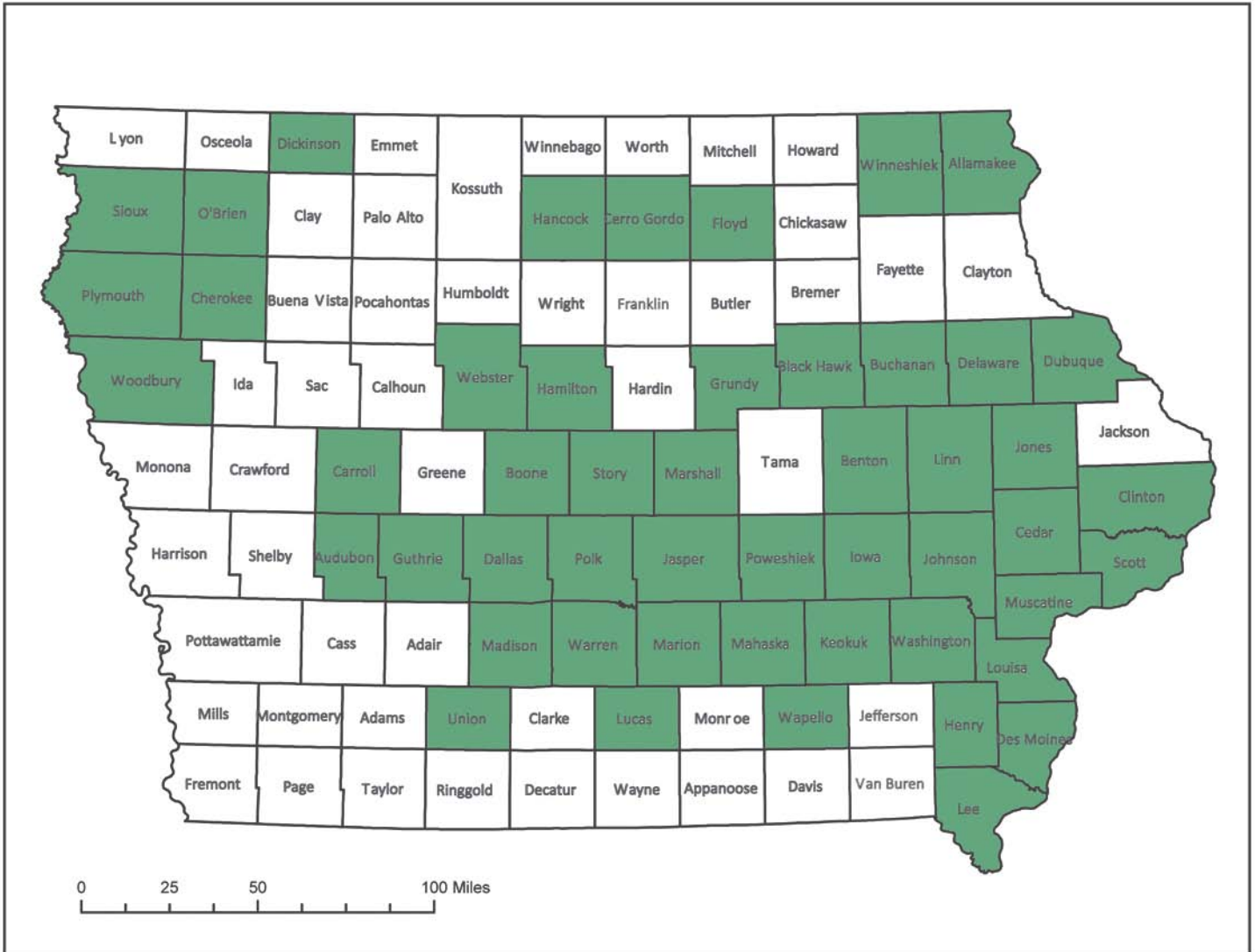
The UI BioVentures Center at the Research Park opened in November of 2008. This 35,000 sq. ft. state-of-the-art biosciences incubator facility allows the University to provide laboratory facilities to support technology based companies emerging from the commercialization of faculty research as well as other startup companies drawn to the area by the substantial R&D assets of the University. We have 11 resident companies, who employ 75 people, and have leased 11 of the 20 laboratories in this facility to startup companies, 6 of which were formed from technology created by UI faculty. Past economic development (GIVF) funding was critical in enabling the design and construction of this facility, which now allows us to capitalize on University assets. Eleven companies (ASL Analytical, Bio::Neos, Inc., Cellular Engineering Technologies, CQM Systems, Exemplar Genetics, Hennepin Life Science, KemPharm, Inc., Tansna Therapeutics, Terpenoid Therapeutics, Inc, Vertex Pharmaceuticals, and VIDA Diagnostics) occupy 11 laboratories and 23 offices in BVC, accounting for 74% of leasable space. Two floors of the west wing of the BioVentures Center have been fit out for those UI units previously housed in Oakdale Hall. These units are associated with research centers reporting to the Colleges of Public Health and Pharmacy and the Office of the Vice President for Research.

Technology Innovation Center (TIC)

The Technology Innovation Center provides office space and a nurturing business environment to new technology-based ventures that do not require wet laboratories. In FY12, TIC reported a total of 9 companies and 26 employees. The occupancy rate for the TIC is approximately 77%, with 27 of the 35 of the offices currently rented. Since TIC opened in 1989, 23 of the 41 companies affiliated with TIC are still in business in Iowa today.

¹ This includes active companies at the Technology Innovation Center and/or at the UI Research Park, and graduate companies located in Iowa that are still in business.

**FY12 Labor Shed for Affiliated Companies and Anchor Laboratories
UI Research Park, BioVentures Center and Technology Innovation Center**



INSTITUTIONAL ACTIVITIES AND SERVICES THAT INDIRECTLY PROMOTE ECONOMIC DEVELOPMENT

University of Iowa Research Park, BioVentures Center and Technology Innovation Center

A variety of educational and training programs are offered for UIRP/BVC/TIC tenants and faculty investigators including company marketing techniques, SBIR grant writing workshops, and other entrepreneurial workshops and boot camps. In FY12, a GIVF Development Funds Proposal competition was held for our BVC and TIC tenants, \$100,000 was awarded to 7 companies to further their concepts. Top awardees, ASL Analytical and Exemplar Genetics, both received \$20,000; (2) awards of \$15,000 each were awarded to CQM and Tansna Therapeutics; and the (3) \$10,000 awardees were Bio::Neos, Innomatix, and KemPharm. UIRP holds quarterly roundtables at the BVC. These roundtables are initiated by the Research Park companies. Agenda items cover Park and BVC updates, as well as company issues and concerns. The Multi-Purpose Room at the BioVentures Center was also made available in FY12 to over 50 outside groups, including but not limited to, Legislative and state agency meetings, vendor shows, pitch and grow competitions, Chamber events, Iowa City Area Development forum's, STEM education meetings and

the Corridor Business Alliance. The state-of-the-art meeting rooms at the BioVentures Center have become a vital meeting hub for agencies across the state, and creates unique networking opportunities to link the Government, the University and the Private Sector.

The John Pappajohn Entrepreneurial Center (JPEC)

JPEC offers one of the most comprehensive entrepreneurial education and business support programs in the nation. Featured programs supporting economic development include: providing business consulting services to small companies located across Iowa through its student field study program (51 companies assisted last year); hosting/sponsoring elevator pitch and business plan competitions to support innovation and new venture creation (11 competitions held); supporting the creation and launch of student-based business through the Bedell Entrepreneurship Learning Laboratory (17 offices at full capacity, plus 10 businesses on a waitlist); and delivering entrepreneurial education through academic courses across campus and online, workshops/seminars, and high school teacher training/curriculum.

- JPEC is one of the nation's top undergraduate entrepreneurship programs. The Center combines academic course work with experiential learning and is open to all UI students. Each year, over 2,000 students enroll in entrepreneurship courses and, since the program launched in 1997, over 2,100 students earned one of the certificates or degrees offered by the Center.
- The Bedell Entrepreneurship Learning Laboratory has been operating over its capacity of 17 offices, housing a total of 44 businesses throughout the past year. A total of 286 students from nearly every college have been impacted by the facility and received assistance with their business plans since its inception in 2004.
- The Jacobson Institute for Youth Entrepreneurship is a comprehensive program that enriches K-12 students' lives through classroom and practical educational experiences. During FY12, the Jacobson Institute impacted over 2,608 youth and worked with nearly 134 high school teachers in Iowa who are using the YouthBiz Central online curriculum. 116 students participated in summer camps held across Iowa.

IOWA Centers senior staff participated in the following economic development organizations in FY12.

STATEWIDE:

- Iowa Innovation Council
- Iowa Biotechnology Association, Board of Directors
- Technology Association of Iowa, Board of Directors
- Technology Association of Iowa, Panelist Reviewer for TAI annual awards
- STEM Advisory Board

LOCAL AND REGIONAL:

- Cedar Rapids Metro Economic Alliance, Board Member
- Corridor Business Alliance
- Iowa City Area Development Group, Board of Directors
- Iowa City Area Chamber of Commerce, Member
- Iowa's Creative Corridor
- Economic Development Center (EDC)

NATIONAL:

- Small Business Association (SBA)
- Global Consortium of Entrepreneurship Center (GCEC), Leadership Circle
- University Economic Development Association (UEDA)
- United States Association for Small Business and Entrepreneurship (USASBE)
- Colligate Entrepreneurship Organization (CEO)
- Students in Free Enterprise (SIFE)
- National Collegiate Inventors and Innovators Alliance (NCIIA)

- National Science Foundation (NSF) SBIR program, Mentor for Phase I-II awarded startups
- NSF SBIR program, Panelist for Proposal Reviews
- NBIA National Business Incubator Association
- AURP Association of University Research Park and Association of University Midwest Research Park Directors
- NCIIA – National Collegiate Inventors and Innovators Alliance

METRICS DESCRIBING ULECONOMIC DEVELOPMENT ACTIVITY IN FY12

a. Number of disclosures of intellectual property	102
b. Number of patent applications filed <ul style="list-style-type: none"> • U.S. Applications • National Applications • Patent Cooperation • Total Applications 	72 27 <u>17</u> 116
c. Number of patents issued	59
d. Number of license and option agreements executed on institutional intellectual property (The 21 license/option agreements were for a total of 39 different UIRF disclosures) <ul style="list-style-type: none"> • In Iowa 	21 7
e. Number of license and option agreement yielding income	94
f. Revenue to Iowa companies as a result of licensed technology	\$2.2 million
g. Number of startup companies formed and executing license for UI technology <ul style="list-style-type: none"> • In Iowa (Entac, FxRedux) 	2
h. Number of companies in research parks, incubators and graduates located in Iowa	41
i. Number of new companies in research parks and incubators	2
j. Number of employees in companies in research parks and incubators	1812
k. Royalties and license fee income	\$7.05 million
l. Total sponsored funding	\$438.1M
m. Corporate sponsored funding for research and economic development <ul style="list-style-type: none"> • In total • In Iowa 	\$52.9 million \$ 1.1 million
n. Iowa special appropriations for economic development in the following categories <ul style="list-style-type: none"> • Annual state appropriations for ongoing programs (TIC, ORP and CADD) • Grow Iowa Values Fund appropriations 	\$209,279 \$576,000
o. Estimated jobs created by SBDC clients	114

DIRECT AND HANDS-ON TECHNICAL ASSISTANCE TO BUSINESSES, FACULTY INVESTORS & ENTREPRENEURS

The University of Iowa Research Foundation (UIRF)

The UIRF aspires to maximize public benefit through commercial use of UI technologies, excellence in commercialization and long term sustainability. In pursuit of this vision, UIRF's primary functions are:

- Licensing - finding suitable partners for commercializing UI technologies and inventions
- New Ventures - identifying and developing new high growth UI technology spinout companies suitable for venture capital financing
- Intellectual property services which include protecting UI inventions through patents and copyrights, advising on intellectual property terms for Clinical Trials and Sponsored Research and executing out-going material transfers
- UIRF's economic development emphasis is heavily focused on startup formation. Working directly with UI faculty, entrepreneurs, and investors in selecting, evaluating and developing new companies, these activities include: IP analysis for viability of proposed company products and IP protection strategies and execution; UIRF fronts the cost of IP protection
- Due diligence on the viability of UI spinout companies
- Business model development for UI spinout companies
- Providing mentors for high new priority UI companies
- Providing gap funding for highest priority projects
- Licensing to UI spinout companies
- Extensive mentoring and education of faculty in new company formation

UIRF, in collaboration with the Iowa Centers for Enterprise and commercial partners (The Entrepreneurial Development Center and Startup Midwest), managed to analyze new projects, and fund proof of concept projects that could lead to new company formation. A summary of projects evaluated and forwarded in FY12 is indicated in the following table. A Historical View of GIVF Commercialization Funding that stimulated start up activity is also provided in Appendix A.

2012 Commercialization & Business Development Funding Awards

Potential of New Projects Evaluated & Supported

No.	Project	Lead Faculty	Funding Awarded \$(K)	Cumulative Awards \$(K)	Type of Award
1	Muscle wasting therapies	Adams/Welsh	184	184	Commercial. Grant
2	Metabolic engineering of a microbe to mimic human liver drug metabolism. First stage scale-up and validation of metabolite production from two FDA approved drugs, dextromethorphan and nifedipine	Shuvendu Das	33	217	Commercial. Grant
3	Development of a novel therapy for treating a fatal, childhood onset neurodegenerative disorder	Beverly Davidson	40	257	Commercial. Grant
4	Reducing invasiveness and increasing access to tumor conformal brachytherapy for cervical cancer	Ryan Flynn	36	343	Commercial. Grant
5	Pilot study of magnetic pericardial puncture catheter system (MaPP-CS)	James Martins	50	393	Commercial. Grant
6	Development of a ubiquitous Immune Complex Vaccine technology platform	Tony Vandebush	25	418	Commercial. Grant
7	Developing the FxRedux Articular Fracture Reduction Planning Service Model	Don Anderson	30	448	Commercial. Grant
8	Intratumoral immunization using nanoparticles	Alisasger Salem	50	498	Commercial. Grant
9	Therapeutic Garment	Terry Wahls	35	533	Commercial. Grant Further Evaluation
10	Automated verification of industrial software	Cesare Tineli	Up to 2	247	Further Evaluation
11	Driving simulator for emerging markets	Rangaswamy Rajagopal	Up to 2	249	Further Evaluation
12	Production of lower cost xylitol (natural sweetener)	Michael Louie (Shuvendu Das)	Up to 2	251	Further Evaluation
13	Lower cost production of value-added chemicals and ingredients	Shuvendu Das (Michael Louie)	Up to 2	253	Further Evaluation
14	Nanoparticles for improving vaccine efficacy	Ali Salem	Up to 2	255	Further Evaluation
15	Improving photovoltaic efficiency	Johna Leddy	0	255	Not Funded

16	Diagnostics for alcoholism	Rob Philibert	0	255	Not Funded
17	Radiation hard silicone	Ugur Akgun	0	255	Not Funded
18	Patient stand enabling weight-bearing for improved imaging of foot and ankle abnormalities	Phinit Phisitkul	0	255	Not Funded
19	Mobile phone app for the magazine “ <i>The Iowa Review</i> ”	Russell Valentino	0	255	Not Funded
20	Mobile phone app for highlighting Iowa City UNESCO features	Jon Winet	0	255	Not Funded

JPEC provides one-on-one counseling to technology based entrepreneurial companies. JPEC also uses undergraduate and MBA student teams to conduct product assessments, strategic marketing assessments, and other components of an entrepreneurial business plan. Some 51 consulting projects were conducted in FY12. In addition, JPEC supports the efforts of the UIRF to vet and spin-out companies based on faculty technology by providing strategic business advice and participating in business development assessments. Several programs related to hands-on technical assistance are described below.

- **Six-Week Start-Up** – JPEC delivers this intense entrepreneurial training program for start-up and growing businesses. The initiative prepares aspiring entrepreneurs to launch new ventures, and existing companies to grow their businesses. Two classes were held in Iowa City in FY12.
- **Seminars/Workshops/Lecture Series** – JPEC hosted over 16 different opportunities last year for students, faculty and persons from the community. In FY12, over 1,529 attendees came to learn from experienced entrepreneurs on a variety of topics including: Technology Export Roundtable, various tax workshops, Entrepreneurial Boot Camps and lecture series.
- **Wellmark Venture Capital Fund** – JPEC is the regional administrator of the \$5M Wellmark Venture Capital Fund that supports the creation and growth of new businesses throughout the state. JPEC screens applicants, performs due diligence, evaluates business concepts, and assists applicants with their business plans. JPEC partners with area angel investors, equity fund managers, lenders, the Iowa Economic Development Authority, and the Small Business Administration to help business owners secure additional venture funding.
- **Elevator Pitch Competitions** – Two Elevator Pitch Competitions were held with \$57,000 in cash prizes awarded. One contest was open to any current UI Faculty, Staff, or Graduate Assistant and 30 teams participated in the competition. The 12 winners received \$40,000 in funds. A separate competition was held for UI students in which \$17,000 was awarded to 14 student teams. Thirty-seven undergraduate teams competed.
- **New Venture Challenge** – The JPEC and the UIRF hosted the Spring 2012 New Venture Challenge with over \$56,500 in cash prizes awarded. The New Venture Challenge was open to all UI Faculty, Staff and Students, as well as startup companies with principal addresses at the UIRP. Over 39 teams competed in this event.
- **Iowa Medical Innovation Group** – This unique student led program focuses on identification of solutions to clinical problems through collaborations in the Colleges of Medicine, Engineering, Business and Law. Students work on creating medical devices and/or Health IT solutions with the assistance of staff from JPEC and the UIRF. To date, over 40 interesting technologies have been identified and reviewed and 2 are currently moving forward in advanced phases of development in anticipation of forming startup companies. This program, now in only its 3rd year, has attracted more than 74 students who meet weekly with faculty, staff and external business mentors.

The Small Business Development Center (SBDC)

SBDC offers one-stop assistance to small business owners by providing high quality, one-on-one counseling that is tailored to the needs of individual clients. The SBDC conducts research, counsels, and trains business owners in management, financing, and operating small businesses, and provides comprehensive information services and access to experts in a variety of fields. Educational programs are offered on topics that include taxes, accounting systems, and business planning. It also offers a wide range of training seminars concerning business skills and issues, and assists small businesses in securing Small Business Administration backed loans. In FY12, the SBDC served 354 clients, assisted in 31 startups, helped clients raise \$2,580,500 in financing and create 114 jobs.

DIRECT ECONOMIC DEVELOPMENT ASSISTANCE TO IOWA COMMUNITIES

John Pappajohn Entrepreneurial Center (JPEC)

- **Distance Certificate in Entrepreneurial Management** – The Certificate in Entrepreneurial Management is available online to students across the state of Iowa as part of Iowa Community College partnerships. Many online students combine The Certificate in Entrepreneurial Management with the UI's Bachelor of Applied Studies (BAS) or Bachelor of Liberal Studies (BLS) in order to earn their undergraduate degree from The University of Iowa. These online opportunities are offered through UI Division of Continuing Education.
- **Business Consulting Services** – JPEC offers business consulting services to entrepreneurial and startup companies around the state.

Corridor Business Alliance

The Corridor Business Alliance was created in December 2009 and is composed of leaders from the Cedar Rapids Area Chamber of Commerce, the Entrepreneurial Development Center, Iowa City Area Chamber of Commerce, Iowa City Area Development Group (ICAD), Kirkwood Community College, MidAmerican Energy, Priority One, Kirkwood's Small Business Development Center, the *University of Iowa's Small Business Development Center, UI Research Foundation and John Pappajohn Entrepreneurial Center*. More information on this regional approach is available at <http://corridor2020.com/2009/11/corridor-business-alliance/>. The overarching goal is to identify and leverage the region's unique educational, business development and industrial assets to enhance recruitment of new companies, development of innovative startup companies and retention of existing industry. The three ICE units highlighted above have been central in the maturation of this regional philosophy and economic development success.

ECONOMIC DEVELOPMENT SERVICES PROVIDED BY THE RESEARCH PARKS, INCUBATORS

The University of Iowa Research Park, BioVentures Center and Technology Innovation Center

Corporate tenants of the Park benefit from sustained relationships with UI in the form of access to specialized research facilities, library access, faculty consultation, research collaboration and access to students as interns and employees. UI resources also provide smaller companies with assistance in business planning, identifying professional service providers, introductions to local and state government agencies and the regional business community, help in identifying potential sources of investment and other funding and communications. For a list of companies and developers associated with the Research Park, BioVentures Center and Technology Innovation Center see Appendix C.

Research Park Core Facilities

In addition to campus based core university facilities, four specialized UI laboratories reside within the Research Park. These facilities provide technical support services critical to the growth of startup companies as well as University and existing industry partners. These units provide Iowa with unique capabilities that the Iowa Economic Development Authority (IEDA) and local economic development entities have utilized in recruitment of outside companies to the Park, the region and the state. These facilities include:

University of Iowa Pharmaceuticals

The University of Iowa Pharmaceuticals (UIP) is a division of the University of Iowa College of Pharmacy that offers contract analytical, development, and GMP manufacturing services to the pharmaceutical and biotechnology industry. The Center for Advanced Drug Development (CADD), the analytical segment of UIP, is a U.S. Food and Drug Administration (FDA) registered and current Good Manufacturing Practices (cGMP) compliant laboratory that works closely with the manufacturing groups at University of Iowa Pharmaceuticals, housed on the central University campus. The focus of CADD is the development of analytical methods and testing to support the manufacture and control of clinical supplies of new drugs entering initial clinical trials. They are particularly attractive to smaller pharmaceutical/biotechnology companies that have new drugs moving into the clinic but have not developed their own analytical or manufacturing capabilities.

CADD, as a part of UIP, has an extensive recurrent client base of mainly smaller biotechnology companies, manufacturers of pharmaceutical excipients, and a growing pool of U.S. and foreign pharmaceutical firms. CADD is particularly well positioned to work directly with discoveries from University of Iowa research laboratories, thereby providing an opportunity to hasten technology transfer and shorten the time to market. The presence of these FDA registered facilities, along with the Center for Biocatalysis and Bioprocessing, makes UI unique among US universities to facilitate the development of new therapeutics from pharmaceutical and biotechnology based companies, as well as serving to enhance the translational science research occurring within the University of Iowa.

Center for Biocatalysis and Bioprocessing (CBB)

The CBB is a microbial research, pilot plant and education center reporting to the Vice President for Research and Economic Development. The center links university scientists from 6 different colleges who focus on biocatalysis and bioprocessing. The Center also performs process research and development including fermentation and bioprocessing of food products, biofuels, bio-pharmaceuticals and other products of

biotechnology. The center collaborates with industries, including biotechnology companies from Iowa, and is capable of working from small molecules to complex proteins, such as alcohols, vaccines, antibiotics, anticancer drugs, polymers, biochemicals, enzymes, pharmaceutical intermediates and derivatives of bioactive compounds.

In the Research Development and Process Laboratory, CBB can conduct extensive process research including first level production from the bench-scale to 1000 liter fermentation. For example, CBB is now developing Simulated Moving Bed Chromatography for protein and small molecule separations. The center also has a current Good Manufacturing Practices (cGMP) production facility for biotherapeutics (products produced under cGMP conditions can be used in Phase I human clinical trials) at a scale of up to 300 liters.

The CBB is central to the University's efforts to attract Biotechnology R&D and industrial fermentation companies to Iowa. CBB has worked with ICE, IEDA and other Iowa economic development agencies to recruit companies to Iowa. The GIVF funded cGMP laboratories has already put CBB as the leading bioprocessing facility in a US university setting. In 2008, CBB opened the GMP, a state-of-the-art fermentation and bioprocessing laboratory to produce biotherapeutics for Phase I human trials. This new facility will position UI on the cutting edge of biotherapeutics production.

National Advanced Driving Simulator (NADS)

The National Advanced Driving Simulator (NADS) is a center for driving simulation excellence located at the University of Iowa's Research Park. This center has the mission of improving driving safety for everyone by researching the connection between humans and motor vehicles. Development and research conducted at the NADS – sponsored by government, military, and industry partners – saves lives, improves quality of life for motorists, and advances the state of the art in driving simulation. This facility is home to the one of the world's most advanced research driving simulator, the NADS-1. In addition, NADS has developed an in-house portable driving simulator, the MiniSim™, which is currently being marketed to research institutions around the country and commercially to pharmaceutical and driver training sectors. Recent research at NADS has focused on detection of impaired drivers, distracted driving, drowsy driving, advanced vehicle crash warning systems, and future vehicle communication systems.

State Hygienic Laboratory

Since 1904, the State Hygienic Laboratory has been at the forefront of public health issues in Iowa. As the state's public health and environmental laboratory, the Hygienic Laboratory serves all of Iowa's 99 counties through disease detection, environmental monitoring, and newborn and maternal screening. Clinical laboratory tests provided include virology, serology, microbiology, molecular biology, blood lead screening and biological and chemical terrorism response. State-of-the-art chemical, biologic and enzymatic analytical methods are used in this testing, which is performed at the facilities on the UI Research Park in Coralville, in Ankeny and in Milford, Iowa, as part of Lakeside Lab. The laboratories also serve as important training facilities and can perform fee-for-service analyses for companies on the Research Park campus, throughout Iowa and the Midwest. The State Hygienic Laboratory also offers unique training facilities for companies and personnel associated with the clinical laboratory specialties, as an experiential education site for community college students studying laboratory chemistry, and will serve as a training headquarters through live and distance-learning for public health professionals across Iowa.

COLLABORATION FOR ECONOMIC DEVELOPMENT WITH IOWA ENTITIES

Shovel Ready Site Initiative/Certification

The Shovel Ready Site Program initiative was spear-headed by the Iowa City Area Development Group. The program is designed to give the UI Research Park a competitive edge in the site selection marketplace. The goal of the program is to have selected sites shovel ready, connections to utilities and other physical infrastructure, clear swift procedures for permitting and incentive programs that can be quickly applied to a project. The UI Research Park, along with two other area sites, was chosen as a pilot project site. Gaining shovel ready certification provides a very positive boost to recruitment of technology based companies to the UI Research Park and multiple additional sites are nearing shovel ready classification as the interest in locating within the Park continues to grow. In FY12, we began a roads and sewer project, in collaboration with the City of Coralville. Upon completion of this project, all 15 remaining lots will become Shovel Ready.

IAWind

The University of Iowa, and particularly the College of Engineering, took the lead in working with IDED to create the Iowa Alliance for Wind Innovation and Novel Development (IAWind), a virtual organization established to promote the wind energy industry in boost to Iowa. This collaboration includes:

- The Regents Universities
- Iowa Community Colleges
- State Agencies (IDED, DNR, Office of Energy Independence)
- Federal Agencies (NSF, DOE)
- Iowa Wind Industries
- Community Partners (Iowa Energy Center, Iowa Wind Energy Association)

The organization comprises components related to policy, research, training and education, and testing facilities. The impetus for this organization arose as the College of Engineering was assisting the Iowa Department of Economic Development in its efforts to recruit wind energy companies to the state, and the need to identify and integrate the state's wind energy assets became obvious. For more information: <http://www.iawind.org>

Iowa NSF EPSCoR

The three Board of Regent Institutions, working with state government, community colleges and industry, led a successful effort to win a highly competitive 5-year, \$24M year grant from the National Science Foundation. The program, known as EPSCoR (Experimental Program to Stimulate Competitive Research), is focused on building research capacity and increasing competitiveness for the State of Iowa through investments in infrastructure and human capital. EPSCoR builds upon the state's renewable energy goals, and leverages linkages with industry and Iowa economic development entities to increase the pool of Iowans well trained in the sciences to compete in the 21st century global economy. A state EPSCoR coordinating committee comprised of university, community college, industrial, governmental and legislative leaders will oversee the ongoing programs and identify new directions as well as leverage opportunities where Iowa communities can benefit directly from the work on the grant. The link to renewable energy, competitiveness, STEM education and workforce development also fits well with Governor Branstad's vision for innovation, economic development and STEM education on a statewide level.

The University of Iowa linkages to the Dubuque Sustainable City Program

The University of Iowa's strong commitment to community economic development is illustrated in the project with the City of Dubuque. To better address the problems and challenges faced by small towns in Iowa and the Midwest, the School of Urban and Regional Planning at the University of Iowa launched the Iowa Initiative for Sustainable Communities (IISC) in 2009. IISC provides significant and ongoing outreach to Iowa's communities while transforming teaching and learning at the UI by engaging students in a student-faculty-community collaboration that is focused on some of the most important problems faced by communities in Iowa.

University of Iowa Sustainable Dubuque Initiative – this joint effort between the City of Dubuque and the UI School of Urban and Regional Planning is focused on helping Dubuque validate and actualize the specific approaches they plan to take going forward and involves graduate students from UI working local college students and city leaders on several projects over the next few years which include:

2011-12 Projects

- Indicators and indicator measurements for the 11 sustainability principles
- Renewable energy asset mapping
- Portrait of poverty in Dubuque
- Local foods and local institutions
- Design of Green and Healthy Homes program

2012-13 Projects

- Dubuque County Smarter Planning Indicators
- Accelerating sustainable transportation planning through the use of “smart” data
- Determination of Real Housing need with special attention to residential as well as commercial development in the Washington Neighborhood
- Successful Neighborhood School Strategies
- Survey of best practices for general plans for redevelopment of port areas

Additionally, Urban and Regional Planning students have had ongoing projects in Decorah, Wellman, Anamosa, and Columbus Junction in the past and have ongoing projects in Burlington, Decorah, Oskaloosa and Charles City in addition to the Dubuque projects.

Kirkwood Regional Center at the University of Iowa

Joint planning between UI, Kirkwood, and 10 neighboring school districts has culminated in the creation of an innovative regional center focused on STEM education and workforce development. The project is in final design and this 90,000 square foot center is due to open in late 2014. It will provide advanced STEM coursework for high school students through the South East Region along with UI augmented career academies designed to enhance workforce preparation as well increase interest in future STEM careers for both college and non-college bound high school students. This unique center linking K-12, Community College and University experiences will also serve as a programmatic home for the newly created STEM Regional Hubs by the Governors STEM taskforce. The Southeast Regional Hub is co-led by Kirkwood and the University of Iowa. Another important value added feature will be the availability of high technology experiential education sites through UIRP park companies and University facilities to augment existing career academy education.

GROW IOWA VALUES FUND (GIVF)

GIVF Impact for the University of Iowa and the Iowa Centers for Enterprise (ICE)

From 2005-2012, GIVF provided UI critical support to build the infrastructure needed to better transform UI faculty discoveries into new businesses and/or licensing opportunities. Funds have been used in the following general categories:

- Stimulate commercialization and provide proof of concept funding for promising UI research.
- Create an infrastructure through personnel and facilities to support growing startup companies within the UI Research Park campus.
- Provide comprehensive entrepreneurial education and business support programs.
- Lead regional economic development strategy for the Cedar Rapids/Iowa City/Coralville corridor and work closely with existing industry in terms of science and business development.
- Provided grant funding to further develop our companies' technologies and ideas. More than 14 of our companies participated and over \$100,000 in grant funding was awarded.

Successful Technology Transfer and Commercialization enabled by GIVF Proof of Concept Support

Professor Michael Abramoff in the Department of Ophthalmology was provided GIVF proof of concept funding in 2007 which led to the formation of IDx. The company, based in Iowa City with 7 non-UI employees, was established in 2010 and has raised over \$4.3M in private funding in FY12. IDx has an Iowa City office, and is currently conducting pivotal clinical trials at 7 locations, including the UI. <http://www.eyediagnosis.net/>

IDx is a medical instrument and software company that provides computerized automated detection of diabetic retinopathy, risks of cardiovascular disease, and infections. IDx has seven patented algorithms (3 granted and 4 pending) that read digital photos of the retina within seconds. These algorithms have been found to be as good as or better than retinal experts. The results have been published widely in peer-reviewed top Ophthalmology journals.

In summary, IDx has licensed patented computer reading algorithms that can detect diabetic retinopathy, hypertensive retinopathy and arteriole-venous ratios. These algorithms have been proven in clinical trials of thousands of patients and the results have been published. IDx has almost completed development on a low cost camera which is easy to use to get high quality retinal images. IDx will market the retinal imaging technology to primary care physicians, "minute clinics" and specialists worldwide. The analysis of the retinal images will provide health care providers with important information concerning the best treatment of their patients at a low cost.

Professors Mark Arnold and Gary Small in the UI Department of Chemistry were able to use proof of concept funds to translate and commercialize their research by creating ASL in 2005. ASL is housed in the UIRP Bioventures Center, currently has 4 full time employees, has recently hired a full time CEO and is planning to expand and increase personnel in the next 6 months. To date, ASL Analytical has garnered \$270K in Series A funding, \$2.8M in grants and \$766K in service contracts and has seven employees. <http://www.asl-analytical.com/>

ASL is a translational research company with the primary objective of developing chemical sensing technology that permits real-time monitoring and control of critical chemical species within a targeted process. ASL's unique approach includes the exclusive use of ASL's Constrained Variance™ concept combined with the use of innovative optoelectronic devices designed in-house specifically for such analytical measurements. The resulting spectroscopic sensing technology represents an analytical platform with tremendous potential for monitoring and controlling key chemical intermediates of value in the biopharmaceutical, biomedical, clinical and biotechnology settings. This company is housed in the BioVentures Center and has recently hired a CEO. The company has

new products being tested by customers, is moving into a manufacturing phase and plans to use Iowa companies for supply chain materials.

VIDA Diagnostics, Inc. is a diagnostic pulmonary imaging company housed in the UIRP BioVentures Center that was created in 1992, based upon the research and technology of 4 UI faculty members in the Carver College of Medicine and the College of Engineering. GIVF funding was instrumental in their growth and evolution as well as their ability to generate significant follow-on private funding, which helped VIDA to achieve then International Organization for Standardization (ISO 13485) certification and CE certification for its flagship product, Apollo. <http://www.vidadiagnostics.com/>

The CE certification permits VIDA to sell Apollo for clinical use in the European Economic Area and Switzerland. Apollo currently has FDA 510(k) approval for clinical use in the U.S. VIDA recently hired a seasoned CTO to strengthen the technical leadership. VIDA's Iowa office currently employs 12 full-time employees and 10 interns.

**Grow Iowa Values Fund projects for
FY 2011 – FY2012**

GIVF Program Summary	Description of Program	FY12 – GIVF Expenditures From FY11 and FY12	Progress through June 30, 2012 ROI DATA
<u>VP for Research</u>	These funds have been instrumental in enabling UI to expand the economic development infrastructure. These funds supported critical economic development functions associated with the UI Research Park, BioVentures Center, Technology Innovation Center and IOWA Centers for Enterprise.	FY12 \$603,992 MATCH: UI BioVentures Center in-kind contribution \$291,966	Satellite offices for ICE units have been established at BVC. This will provide tenant companies direct access to experts to help move their business development goals. Preferred vendors selected for critical UIRP infrastructure including a fitness facility and a day care facility for park companies, Our collaborative internal economic development organization is leading efforts of the Corridor Business Alliance to create a regional economic development strategy for the Cedar Rapids/Iowa City/Coralville corridor Staff support for UIRP, BVC and TIC Annual entrepreneurial education and celebration event that highlighted ICE accomplishments as well as recognize UI faculty, staff and students for entrepreneurial awards.
<u>BioVentures Center and University of Iowa Research Park</u>	The BioVentures Building was made possible by a collaborative partnership between Ryan Companies and the University of Iowa. The new building provides critical space and services for life science startup companies at the University of Iowa Research Park. The BioVentures Center will use these funds to pay debt associated with the construction of the new BioVentures Building.	FY12 \$51,119 MATCH: UI BioVentures Center in-kind contribution \$25,560	74% of leasable space at the BVC and 77% of leasable space at TIC. Eleven companies (ASL Analytical, Bio::Neos, Cellular Engineering Technologies, CQM Systems, Exemplar Genetics, Hennepin Life Science, KemPharm, Inc., Tansna Therapeutics, Terpenoid Therapeutics, Inc., Vertex Pharmaceuticals and VIDA Diagnostics) New shared lab space built out in BVC to support early stage companies in their pursuit of external funding including SBIR A GIVF Development Funds Proposal Competition was held in the Spring 2012 for the BVC/TIC tenants. 14 companies participated and 7 companies received \$100,000 in awards.

<p><u>John Pappajohn Entrepreneurial Center</u></p>	<p>To fund expenses associated with training, consultation and outreach for Iowa entrepreneurs. JPEC continues to expand outreach programs for Iowans: 1) Support the development, implementation, and expansion of entrepreneurship programs; 2) Enhance support for faculty and area technology and high potential startup and early stage companies through one-on-one consulting, education seminars and workshops, and student/faculty field study projects and 3) Continue support for elevator pitch and business concept competitions for UI-based new and emerging ventures.</p>	<p>FY12 \$282,000</p> <p>MATCH: JPEC in-kind contribution \$141,000</p>	<p>Employed a Project Manager to work with UI faculty / staff / students in the areas of strategic business planning, market research, operations and financial assessment. Project manager also identified and managed projects for existing Iowa-based companies to work with UI student consulting teams.</p> <p>JPEC hosted over 16 different opportunities last year for students, faculty and persons from the community. In FY12, over 1,900 attendees came to learn from experienced entrepreneurs on a variety of topics including: Technology Export Roundtable, various tax workshops, and Entrepreneurial Boot Camp</p> <p>JPEC held various elevator pitch and business plan competitions for UI faculty, staff and students and tenants of the BVC and TIC. Over 400 entrepreneurs participated and 73 received a total of \$169,000 in seed funding</p>
<p><u>University of Iowa Research Foundation (UIRF)</u></p>	<p>UIRF focused on two primary activities: 1) continue its contribution to the integrated model of new company formation and 2) educate faculty in key colleges and departments towards identifying viable technology that has potential to create intellectual property that can be protected and lead to new companies and/or licensing opportunities. Since University derived intellectual property is by nature very nascent in terms of its readiness for forming companies and attracting additional investment capital, GIVF has been critically important to assist in establishing proof of concept in several of our most exciting technologies in advance of forming companies. These funds also are very helpful in helping attract additional proof of concept funds from federal and private sources</p>	<p>FY12 \$1,278,153</p> <p>MATCH: UIRF in-kind contribution \$637,647</p>	<p>Funds were utilized to support existing projects that continue to demonstrate commercial merit. This support included specialized entrepreneurs-in-residence, technology experts, external grant identification and application, intellectual property evaluation and strategy, external partnership development and assistance in securing investment.</p> <p>GIVF Seed Grant Program. GIVF funding has been critical in creating a culture of commercialization and enabling the creation of highly innovative startups based on faculty research. GIVF investments can be directly linked to 13 existing startups as of FY12, 1 licensed UIRF technology in FY12 and 3 others are currently negotiating licenses. See Appendix A for Historical perspective of GIVF funding that Stimulated Start Up Activity</p>

EMERGING TRENDS IN UNIVERSITY ECONOMIC DEVELOPMENT AND TECHNOLOGY TRANSFER

Entrepreneurship continues to be a driving force in global economic growth and wealth creation. For individuals to be successful in today's competitive world they must have interdisciplinary skills that prepare them for the many opportunities and challenges they will face throughout their professional lives; entrepreneurship is one such critical skill set. Regardless of a student's major field of study, learning the entrepreneurial mindset serves as the basis for the University of Iowa's entrepreneurship program—preparing students to innovate, lead and succeed in their chosen field of study. Growing the Regents' entrepreneurship activities coincides with Governor Branstad's priority to build Iowa's economy through high-wage job creation.

UI's JPEC offers a comprehensive academic program for both undergraduate and graduate students. The JPEC provides a proven track record of collaboration and developing innovative programs on campus, as well as established partnerships with Iowa Community Colleges, K-12 schools, local communities and statewide economic development organizations. One of the primary areas of focus for FY13, is to expand public/private partnerships and external engagement to accelerate new company formation, enhance support for statewide business expansion, and provide new opportunities for collaboration and connectivity to Iowa entrepreneurs and investors.

Available Capital- Due to the very early stages of most technology based university research, the access to proof of concept capital investment remains a critical element for continued success. **State Economic Development** funding has been critical to UI success to date and has enabled us to build an infrastructure to enhance our ability to identify high value technologies that could lead to commercialization in the future. Aside from this type of state funding, federal support through SBIR/STTR programs remains a vital program that enables competitive vetting of new ideas and technologies and in some states matching programs to federal support has enhanced technology transfer greatly. Without this early stage investment many of our nascent technologies and very early stage companies will fail in one of the many Valleys of Death along the technology transfer pipeline as most other investments, including some of Iowa's existing programs are focused on more established companies and technologies to insure financial viability.

Alignment with State and Regional Priorities and Cluster industries – working closely with the Iowa Department of Economic Development Authority (IDEA) as they develop their Innovation Council, universities are strategically positioned to support the state's three science and technology platforms of biosciences, advanced manufacturing and IT. They are also working across all 3 Regents institutions to develop strong infrastructure to support renewable energy. This alignment is crucial for Iowa's success in terms of science and technology infrastructure, workforce development and alignment with state and regional economic development assets need to create and recruit key companies in targeted areas. In the case of UI, our local targeted industry clusters include Wind Energy, Food Processing and Biotechnology and the university continues to align itself to support growth in these areas.

Faculty Cluster Research Priorities – As a major strategy to focus our investments on our most successful research programs we have initiated a hiring strategy revolving around clusters of faculty focused on societal problems of major importance and with high probabilities for attracting external funding. Thus in 2010, faculty cluster hires in Water Sustainability were made across 6 colleges and we have current clusters forming in Aging, Obesity, Genetics and Public Humanities, all involving multiple colleges, and in some cases also linking with ISU and UNI. In each of these areas we were working to identify faculty who will also have as a high priority an interest in motivating their colleagues to focus on commercialization and technology transfer related to this "grand challenges".

Appendix A

Summary of Historical GIVF Commercialization Funding Stimulating Startup Activity

GIVF Funded Projects	Potential Startup Identified	Startup Formed	Year Company Started	Company Name	Startup Is On-Going	Remains Under Consideration for Startup	GIVF stimulated What Result	UIRF Option or License
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2012

Adams/Welsh*	25	√	√	2011	Emmyon	Yes	√	Startup Formation	Under negotiation
Davidson	24	√					√		
Das	23	√					√	Startup Consideration	
Flynn	22	√	√	2010	Exobray	Yes	√	Startup Formation	Under consideration
Howard*	21	√					√	Startup Consideration	Currently fundraising
Martins/Mickelsen	20	√	√	2011	Iowa Approach	Yes	√	Startup Formation	Under negotiation
Salem	19	√	√	2009	PolyImmunex	Yes	√	Startup Formation	Under consideration
Wahls	18	√	√	2011	Xcellerator	Yes	√	Startup Formation	Under negotiation
Vanden Bush/Bishop*	17	√	√	2010	Memcine	Yes	√	Startup Formation	Optioned

2011

Anderson	16	√	√	2011	FxRedux Solutions	Yes	√	Startup Formation	Licensed
Baker	15	√	√	2010	Tansna	Yes	√	Startup Formation	Optioned
Doddapaneni	14								
Comeron, Manak	13								
Vanden Bush/Bishop*	12	√	√	2010	Memcine	Yes	√	Startup Formation	Optioned
Howard*	11	√					√	Startup Interest	Currently fundraising

2010

Schlutz	10	√	√	2009	ViewPoint Mole. Diag.	Yes	√	Startup Formation	Optioned
Adams*	9	√	√	2012	Emmyon	Yes	√	Startup Formation	Under negotiation
McCray	8								
Lim	7	√	√	2007	JL Meditech	No	Not viable	Lack of viability	Lack of viability

Leddy	6	√	√	2009	Voltesla	No	Optioned to partners	Startup Formation	Optioned
2007									
Abramoff	5	√	√	2009	IDX	Yes	√	Startup Formation	Licensed
Arnold	4	√	√	2005	ASL Analytical	Yes	√	Industry Partner	Company formed, no license
Hohl	3	√	√	2005	Terpenoid Therapeutic	Yes	√	Startup Formation	Licensed
Welsh	2	√	√	2007	Exemplar Genetics	Yes	√	Startup Formation	Licensed
Wolgennaunt	1	√	√	2006	OMR Sensors	No	Not viable	Lack of viability	Lack of viability
TOTAL	25	19	16	16	16	13			8

*Projects funded more than one year.

Appendix B

Name of Business or Other Entity Served	City and County where this Project is in Place		University Unit that interacted with business or other entity
	City	County	
BUSINESS INCUBATOR TENANTS			
AMBI Group	Coralville	Johnson	Technology Innovation Center
ASL Analytical	Coralville	Johnson	BioVentures Center
Bio::Neos, Inc.	Coralville	Johnson	BioVentures Center
Brain Image Analysis	Coralville	Johnson	Technology Innovation Center
CQM Systems	Coralville	Johnson	BioVentures Center
Cellular Engineering Tech.	Coralville	Johnson	BioVentures Center
Componica, LLC	Coralville	Johnson	Technology Innovation Center
Digital Artefacts, LLC	Coralville	Johnson	Technology Innovation Center
Exemplar	Coralville	Johnson	BioVentures Center
Hennepin Life Sciences	Coralville	Johnson	BioVentures Center
Innomatix, LLC	Coralville	Johnson	Technology Innovation Center
Corvida Medical	Coralville	Johnson	Technology Innovation Center
KemPharm, Inc.	Coralville	Johnson	BioVentures Center
Ramaanchar Technologies, Inc.	Coralville	Johnson	Technology Innovation Center
Tansna Therapeutics	Coralville	Johnson	BioVentures Center
Terpenoid Therapeutics, Inc.	Coralville	Johnson	BioVentures Center
The Thomas Group	Coralville	Johnson	Technology Innovation Center
Vertex Pharmaceuticals	Coralville	Johnson	BioVentures Center
VIDA Diagnostics	Coralville	Johnson	BioVentures Center
SantosHuman, Inc.	Coralville	Johnson	Technology Innovation Center
RESEARCH PARK TENANTS			
LMS North America	Coralville	Johnson	UI Research Park/TIC Graduate
Stanley Environmental, Inc.	Coralville	Johnson	UI Research Park

Vangent, Inc.	Coralville	Johnson	UI Research Park
Integrated DNA Technologies, Inc.	Coralville	Johnson	UI Research Park/TIC Graduate
Noel-Levitz	Coralville	Johnson	UI Research Park
Cargill International	Coralville/Cedar Rapids	Johnson	UI Research Park
Brighton Group	Coralville/Des Moines	Johnson/Polk	UI Research Park
OTHER BUSINESS INCUBATOR GRADUATES ACTIVE IN IOWA			
Ecolotree, Inc.	Lowden, North Liberty	Cedar, Johnson	Technology Innovation Center
Accredo Therapeutics	Iowa City	Johnson	Technology Innovation Center
Corcoran Communications, Inc.	Iowa City	Johnson	Technology Innovation Center
Innovative Software Engineering	Coralville	Johnson	UI Research Park/TIC Graduate
Bio-Research Products, Inc.	North Liberty	Johnson	Technology Innovation Center
aJile Systems, Inc.	Cedar Rapids	Linn	Technology Innovation Center
CompuTerra, Inc.	Cedar Rapids	Linn	Technology Innovation Center
Sustainable Science	Iowa City	Johnson	Technology Innovation Center
Caviforce Technologies, Inc.	Des Moines	Polk	Technology Innovation Center
Sebesta Blomberg & Assoc., Inc.	Coralville	Johnson	Technology Innovation Center
HomeSafe	Coralville	Johnson	Technology Innovation Center
The Patient Education Institute	Coralville/Iowa City	Johnson	UI Research Park/TIC
Police Law Institute	Coralville/North Liberty	Johnson	UI Research Park/TIC
Goldfinch Diagnostics	Coralville	Johnson	Technology Innovation Center
Corridor Media Group	Coralville	Johnson	Technology Innovation Center
DEVELOPERS			
Myriad Developers, Inc.	Cedar Rapids	Linn	UI Research Park
TMD, L.L.C.	Solon	Johnson	UI Research Park
Midwest Development & Invest.Corp.	Fairfield	Jefferson	UI Research Park
Liberty Growth	Iowa City	Johnson	UI Research Park
Hunter Companies	Cedar Rapids	Linn	UI Research Park
S & S Developers	Iowa City	Johnson	UI Research Park
EMRICO	Iowa City	Johnson	UI Research Park
Ryan Companies, US	Cedar Rapids	Linn	UI Research Park
LMC, LLC	North Liberty	Johnson	UI Research Park

**IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

**FY12 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 21, 2012

FY12 Board of Regents, State of Iowa, Annual Economic Development and Technology Transfer Report

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 and Outreach'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. Eight new companies and affiliates joined the Park in FY12, bringing the historical total to 218 companies, research centers, and affiliates. Currently, there are 59 companies and research centers and 17 affiliates located in the Park, employing 1072 and 148 people, respectively.
- There are currently four faculty-affiliated startup companies located in the Innovations Development Facility, the on-campus business incubator in the Roy J. Carver Co-Laboratory under direction of the Plant Sciences Institute. The PSI met with three entrepreneurs interested in forming Limited Liability Corporations involving plant science. They are currently working with these individuals and ISURF (Iowa State University Research Foundation) to develop SBIR phase I proposals to be submitted to USDA and NIH. A total of 18 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 R&D needs continue to find important technical help through the services of Institute for Physical Research and Technology (IPRT) Company Assistance. Companies report positive impacts affecting their sales, investments, and operating costs throughout the languishing recovery from the economic recession of 2009-2011. Of the IPRT clients responding to the survey, the FY11 half decade average of the estimated impact of projects was \$9.9

million; this reflects a decrease in the mean half-decade average of \$12.4 million over the previous three years. Companies also report on the estimated number of jobs that were created or retained because of interactions with Company Assistance. The five-year average for jobs created or retained through FY11 was 18 positions. The mean five-year average over the previous three years was 24 positions. The satisfaction rating given by clients during the past year was 4.84 (1-5 scale, with “1” being “not satisfied” and “5” being “very satisfied”). The decrease in performance can be attributed to two major factors: during the recessionary period, company projects tended toward cost-savings projects rather than new product development, and the Company Assistance program experienced high personnel turnover, primarily due to funding instability.

- DuctSox, a custom engineering, design, and manufacturer of fabric duct work, turned to IPRT Company Assistance to study the performance of fabric and metal ductwork. The 10-month study included computational thermal evaluation between the fabric systems and ceiling diffuser systems. The results of the study showed that the fabric ductwork performed better by heating the area more quickly and uniformly. Nick Kaufmann, sales and product engineering manager, states that having the study “will impact the amount of future building designs that specify our products.” We have continued to work with DuctSox outside the scope of this project to help the company connect with potential customers and other experts in the industry.
- Researchers from IPRT’s Center for Nondestructive Evaluation (CNDE) developed a levee inspection system using ground-penetrating radar to improve on the current standard for levees, which is simple visual inspection. David Eisenmann, a CNDE scientist, points out that “improving levee and dam inspection would have immediate payoffs in terms of saving human lives and reducing the cost of flood damage,” while allowing for “timely repairs before flooding occurs.”
- ISU Extension and Outreach Center for Industrial Research and Service (CIRAS) helps Iowa’s economy prosper and grow by enhancing the performance of industry through applied research, education, and technical assistance. Cumulatively, over the past five years, CIRAS and its partners have reported impact from companies totaling more than \$1.5 billion (sales gained or retained \$1.2 billion, new investments \$255 million, costs saved or avoided \$92 million) with 22,264 jobs added or retained as a result of the assistance they received.
- In FY12, 1,372 businesses from 97 counties in the state received assistance on projects or attended educational workshops from CIRAS staff or partners. Companies responding to surveys reported \$414 million in total impact — \$352 million sales gained or retained \$46 million in new investments and \$16 million in costs saved or avoided. Company executives stated that 5,667 jobs were added or retained as a result of the assistance they received from CIRAS and its partners.
- Last year, CIRAS and partners provided assistance to Hagie Manufacturing in Clarion, Iowa, resulting in the company reporting 283 jobs created or retained and more than \$25 million in impact. Projects included business continuity

planning, research on the creation and evaluation of a sprayer cab design using virtual reality applications, and training on growth strategies.

- CIRAS, working with the U.S. Department of Agriculture (USDA) and ASTM International, manages the USDA Biobased Product Certification and Labeling Program. The label provides an easier way for consumers to identify biobased products, as well as serving as a valuable marketing tool for the manufacturers and vendors of the products. To date, 801 products throughout the U.S. have been certified.

In addition to the labeling and certification program, efforts by CIRAS staff increased the database of biobased products available for consideration under the USDA BioPreferred® program to 491 Iowa products sold by more than 97 Iowa manufacturers and vendors. Nationally 27,484 products sold by more than 3,479 companies have been identified.

To maintain quality control of the USDA BioPreferred® catalog, which contains biobased products eligible for federal procurement preference and products that have earned the USDA Certified Biobased Product label, CIRAS and ASTM International conducted an audit to improve the accuracy of the product information in the catalog.

- CIRAS government contracting specialists work with Iowa businesses, from one-person operations to some of the state's largest employers, to help them understand the government procurement process and to secure contracts. As the only organization in the state of Iowa providing contracting assistance at all three levels of the government market segmentation – local, state, and federal – CIRAS staff provided counseling to more than 1,000 companies. Companies reported more than \$197 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 more than 3,900 jobs.
- More than 850 participants were trained in FY12 by attending conferences and workshops offered through a partnership of CIRAS; Civil, Construction, and Environmental Engineering; Electrical and Computer Engineering; Alliant Energy; Black Hills Energy; CIPCO; Corn Belt Power Cooperative; Iowa Association of Electric Cooperatives; Iowa Association of Municipal Utilities; Iowa Energy Center; Iowa Office of Energy Independence; Michaels Energy; MidAmerican Energy; and Van Meter, Inc. Energy efficiency workshops held across Iowa provided education on compressed air systems and motors. Continuing education was provided for civil engineering practitioners in engineering survey, structural engineering, transportation engineering, geotechnical engineering, water resources, and environmental engineering. Attendees were able to obtain professional development hours towards retention of their Iowa engineering licenses.
- CIRAS is working with the BEST of Iowa (Business Expansion and Strategic Trends), a coalition of Iowa utility concerns, Iowa Economic Development Authority (IEDA), Iowa Innovation Council, Iowa Workforce Development, Association of Business and Industry (ABI), Iowa Area Development Group, Iowa

Business Council, Iowa Department of Education, and Community Colleges to provide a statewide coordinated business retention and expansion program. Economic developers throughout the state use the Synchronist data system to interview executives of Iowa industries to create an Iowa Competitive Capacity ScoreCard for the state. This report provides a detailed analysis of Iowa's situation and identifies opportunities and risks to be addressed. The Governor and Lieutenant Governor of Iowa use the data to assist with scheduling visits with trade cluster companies around the state.

- During federal FY11, which is the most recent full year for the program, the Small Business Development Center (SBDC) provided business assistance to individuals and companies totaling 2,695 clients and 11,259 counseling hours. The SBDC also conducted 232 training workshops in which 3,727 individuals participated.
- The ISU SBDC, along with the ISU Pappajohn Center for Entrepreneurship, provided 530 hours of counseling assistance to startup and existing companies; served 116 clients with one-on-one counseling; educated 396 attendees through workshops; provided advice to several hundred clients via telephone and e-mail; and advised 16 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 Center Long-Term Counseling Activities in Iowa: 2010-2011*, it was shown that for every \$1.00 in state and federal funding invested in the Iowa SBDC in FY10, the total tax dollars returned to the State of Iowa and the federal government by SBDC clients in 2011 was \$1.76. Among the clients in this segment there were 903 jobs saved, 558 jobs created, and over \$40 million in new sales generated. The SBDC helped these clients raise over \$27 million in financing for their businesses.
- Technologies originating at ISU and licensed to Iowa companies have resulted in over \$101 million in sales by those companies in calendar year 2011. Total sales of ISURF-licensed technologies were \$686 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. Preliminary data for FY12 report that 15 different Iowa companies won 21 new or continuing SBIR and STTR awards worth \$6.2 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-one Iowa companies were assisted in the preparation of 23 proposals during FY12. The funded projects reflect Iowa's strengths in biotechnology, information systems, manufacturing and agriculture. Over \$2.5 million in support was awarded by NIH for diverse projects that range from the development of medical

imaging and analysis technologies to new animal models for human diseases. An additional \$1.8 million was received from the Department of Defense for projects that include development of underwater sonar transducers to methods for characterizing free-play in control surface to performance assessments for human and systems in operational environments.

- The Regents Innovation Fund (formerly Grow Iowa Values Fund) program at Iowa State has a competitive research component that pairs ISU faculty members with Iowa industries to create economic benefit for the companies. Surveys completed by companies on projects funded from June 2006 – June 2011 (surveyed one year after project completion) documented more than 114 jobs created or retained and an annual sales impact of more than \$15.8 million due to the research projects conducted in partnership between ISU and the companies.

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

The ISU Extension and Outreach Center for Industrial Research and Service reports several economic development training and other activities.

- CIRAS developed and delivered a training curriculum for Iowa businesses to provide education on the new federal vendor registration portal named the System for Award Management (SAM). The federal government requires all businesses to be successfully registered in SAM in order to be awarded and paid on federal contracts. Eleven workshops, in addition to one-on-one counseling sessions, were held throughout the state with more than 300 attendees receiving assistance.
- As Iowa faced unprecedented drought conditions in FY12, CIRAS educated companies by providing information to help them plan, prepare, and protect their operations from water shortage crises. Information included possible changes in the water supply for businesses located in non-metropolitan cities where the Iowa DNR identified concerns with the ground water levels. Material was distributed directly to companies as well as to Safeguard Iowa Partnership, Iowa Association of Business and Industry, and Iowa Farm Bureau Federation to broaden awareness.
- The Electric Power Research Center (EPRC) is a consortium of 10 utilities that sponsor multidisciplinary power systems research at Iowa State University. Eight of the 10 companies provide services in Iowa; the remaining two are international. Funds provided by the companies are used to conduct research on the reliable and economic operation of power systems. In addition, the research deals with the integration of increasing amounts of wind energy into the grid and the implications of the electrification of transportation. EPRC research helps ensure that Iowa, the U.S., and the world have a supply of electric power that is cost-effective, reliable, and sustainable.
- Keeping Iowa youth interested and participating in STEM initiatives will create a better prepared future workforce and ultimately help improve economic

development in the state of Iowa. The College of Engineering plays a vital role in filling the engineering pipeline by providing critical leadership to K-12 outreach efforts such as FIRST LEGO League, Junior FIRST LEGO League, Project Lead the Way, engineering summer kids' camps, Mom's Night out for STEM, and multiple other outreach events and hands-on activities. In FY12, more than 6,000 middle and high school students attended Project Lead the Way courses at 183 sites across the state. The College of Engineering also supported more than 3,000 participants as part of FIRST LEGO League, hosted nearly 700 youth in engineering summer kids' camps, and engaged approximately 30,000 other Iowans through events across the state.

- In 2012, CIRAS was engaged in three significant research projects in support of the biobased products industry. Research efforts continued to focus on two major areas of importance to industry: economic impact and barriers to development and adoption.

Using the expertise of faculty and staff from the Survey and Behavioral Research Services, the College of Agriculture and Life Sciences Department of Economics, and the College of Liberal Arts and Sciences Sociology Department, CIRAS research expanded the development of benchmark data, heightened industry input and increased knowledge of potential growth and impact of the biobased products industry. Reports on the analysis of the second biobased products industry survey data, the evaluation of the automotive industry potential, and the Iowa consumer acceptance survey were released, as well as Phase II of the green jobs study.

Ongoing research in the use of biobased adhesives in wall-board products, and continuing industry input surveys will help expand and improve the growth and impact of this important economic sector.

2. Please provide the following information for FY12: (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 FY12 data.

- a. Number of disclosures of intellectual property: 102
- b. Number of patent applications filed: 56
- c. Number of patents awarded: 16
- d. Number of license and option agreements executed on institutional intellectual property, in total and in Iowa: 50 total, 19 in Iowa
- e. Number of license and option agreements yielding income: 188
- f. Revenue to Iowa companies as a result of licensed technology: \$101 million (CY10)
- g. Number of startup companies formed, in total and in Iowa (through licensing activities): 0 total, 0 in Iowa
- h. Number of companies in research parks and incubators: ISU Research Park: 46 private and 13 university-related; Plant Sciences Institute Innovations Development Facility (IDF): 4 (all university-related or affiliated)

- i. Number of new companies in research parks and incubators: ISU Research Park: 8 private, 0 university-related and 0 affiliates; Plant Sciences Institute IDF: 1 (university-affiliated)
- j. Number of employees in companies in research parks and incubators: ISU Research Park: 838 private and 234 university-related; Plant Sciences Institute IDF: 6 FTE (all university-related or affiliated)
- k. Royalties and license fee income: \$9.9 million
- l. Total sponsored funding received: \$360.2 million of which \$207.9 million is for research
- m. Corporate sponsored funding received for research and economic development, in total and in Iowa: \$23.4 million total, \$11 million in Iowa
- n. Iowa special appropriations for economic development in the following categories:
 - o Annual state appropriations for ongoing economic development programs (such as research parks, SBDC, IPRT): \$2.4 million—includes \$936,345 SBDC (includes state-wide programs), \$122,355 ISU Research Park, and \$1,365,602 IPRT
 - o Regents Innovation Fund appropriations: \$576,000 and \$105,000 for SBDC
- o. Research expenditures (federal, state and local; business; nonprofit; institution funds; all other sources): \$267.6 million—Note that this is the FY11 total reported to NSF for its Higher Education Research and Development (HERD) Survey
- p. Licenses and options executed per \$10 million research expenditures: 4 (est.)—Note that this is an FY11 figure, the most recent number available
- q. Sales of licensed products by Iowa-based companies: See d. above
- r. 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 3,422

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 Innovation Council, the Iowa Business Council, the Greater Des Moines Partnership, the Ames Economic Development Commission 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 startup or existing companies. Functions of the ISU System for Innovation include:

- *Business Development and Assistance and Entrepreneurial Activities:* Efforts related to startup companies, including business assistance services and SBIR/STTR applications.
- *Technical Assistance and 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.

Senior Capstone Design Projects and Other Student Opportunities

The College of Engineering and the Extension and Outreach Center for Industrial Research and Service (CIRAS) partnered to upgrade the manufacturing teaching and research laboratories including purchasing equipment (Faro laser tracker, Faro metrology equipment, and fatigue testing equipment) that is used for research, to provide hands on opportunities for students with equipment used in industry, and to assist Iowa companies in their manufacturing efforts.

Senior capstone design projects are the culmination of engineering education for undergraduate students. Iowa companies, through a partnership between CIRAS and the College of Engineering, provide students the opportunity to apply their engineering knowledge to real-world applications as a final step in preparation for joining the workforce.

By working with the students, companies gain a new perspective on difficult engineering problems, with many achieving innovative solutions that enhance productivity and lower costs. Companies have a heightened understanding of the value engineers bring to an

organization and are able to showcase their company to students nearing graduation. Companies also gain a better understanding of the value of making an investment in their workforce by providing higher level, higher wage jobs.

In addition to the senior capstone design projects, engineering students have worked with companies on projects related to cellular lean, materials, and facility planning.

During the past two years, students worked on 45 projects with 30 different companies. Companies responding to surveys reported impact of more than \$10 million for these projects.

3B. Direct Economic Development Assistance to Iowa Communities

Sustainable Economies Program

In FY12, CIRAS continued efforts under a 3-year grant from the Economic Development Administration (EDA) University Center program to develop and implement the Sustainable Economies Program in the state of Iowa. This program provides Regional Trade Centers (RTCs) in rural Iowa with an in-depth economic assessment of the financial, social, and environmental “triple bottom line” well-being of the region coupled with technical assistance to the critical organizations and businesses of the region.

During year two of the program, CIRAS continued assistance in the region of Carroll and launched similar efforts in Lee County (Fort Madison and Keokuk) and Appanoose County (Centerville). In addition to the economic analysis, 23 technical assistance projects were launched within the communities and businesses participating in the program. Projects included technical assistance in entering “green” markets, developing a local leadership development program and an economic impact assessment for a regional health care provider.

A broad base of resources from throughout the university collaborated to provide the resources necessary for regional economies to move toward economic sustainability. Extension and Outreach professionals and faculty from the College of Engineering, College of Design, College of Agriculture and Life Sciences, College of Human Sciences, and the College of Business all contributed to the program. FY12 impact generated by the program exceeded \$2.8 million.

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 at ISU (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 from, among others, the Small Business Development Center at ISU 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 R&D cost-sharing program and through short-term, no-cost technical assistance. IPRT actively collaborates with Iowa companies on technology development projects. Many successful businesses have emerged from IPRT technologies, including Mechdyne of Marshalltown and BodyViz of Ames. In addition, startup companies such as Iowa Powder Atomization Technologies of Ames and Avello Bioenergy of Boone have received assistance from IPRT and are showing great commercial potential.

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 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 interact with various industrial clients and tackle an increasingly wide range of challenges.

Iowa State University Research Park

The Iowa State University Research Park is a 230-acre development with over 382,000 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 and Outreach Center for Industrial Research and Service (CIRAS)

CIRAS helps companies grow and prosper. The CIRAS mission is to improve the quality of life in Iowa by enhancing the performance of industry through applied research, education, and technical assistance. CIRAS has been working with companies in communities across Iowa for nearly 50 years and has a vision for Iowa of healthy communities through business prosperity. Because multiple resources are necessary to

meet the needs of Iowa businesses, CIRAS partners with Iowa's universities, community colleges, government agencies, and business associations throughout the state.

- Account managers 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 have expertise in engineering, biobased products and biorenewables, energy systems, management practices, government contracting, productivity, growth services, supply chains, quality systems, safety, supply chain management, sustainability and community-business economic development. Service to industry includes technical assistance in conjunction with ISU College of Engineering labs; regional economic development studies to better understand rural economies; engineering workshops for utilities, county, and city engineers; and educational workshops and mentoring for small to medium sized businesses.
- CIRAS manages the statewide National Institute of Standards and Technology's Hollings Manufacturing Extension Partnership (MEP), a program of the Department of Commerce. The MEP mission is to act as a strategic advisor to promote business growth and connect manufacturers to public and private resources essential for increased competitiveness and profitability. The objective of the program is to enhance productivity, technological performance, and strengthen the global competitiveness of small to medium sized manufacturers. CIRAS provides companies with the training, tools, and connections to accelerate innovation, leading to new opportunities in domestic and export markets.
- The USDA BioPreferred program, enacted as part of the 2002 and 2007 Farm bills, has a goal of increasing the purchase of biobased products by the federal government. CIRAS has helped USDA build this program since its inception in 2002. CIRAS staff manages implementation of the program by gathering industry input, developing government focused marketing strategies, testing biobased content, and facilitating participation in the program. Staff educates public and private stakeholders, manages the biobased product certification and labeling program, and assists with the development of programmatic infrastructure and policy.
- The Defense Logistics Agency, on behalf of the Department of Defense, administers the Procurement Technical Assistance Program (PTAP). The purpose of the program is to generate employment and to improve the general economy by assisting business firms in obtaining and performing under federal, state, and local government contracts. CIRAS is responsible for this program in the state of Iowa. Staff helps businesses determine if they are suitable for government contracting, provides workshop training and outreach events, assists businesses with capturing government sales, and provides post award contract assistance.
- CIRAS manages the Economic Development Administration (EDA) University Center Program in Iowa. The EDA's mission is to lead the federal economic development agenda by promoting innovation and competitiveness, preparing

American regions for growth and success in the worldwide economy. CIRAS was awarded a three-year grant to develop and implement the Sustainable Economies Program. This program integrates detailed economic studies with financial, social, and environmental technical assistance to communities and businesses in rural trade centers across Iowa. This integrated, scientific-based approach to sustainability and the triple bottom line helps the businesses, communities, and overall regional economy begin the process of reliable, long-term growth.

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 startups 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 startup companies among aspiring entrepreneurs. IDF is housed in the Roy J. Carver Co-Laboratory and consists of six well-equipped laboratory modules and three office spaces. 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.

Extension to Communities and Economic Development (CED)

- *Iowa's Living Roadways Community Visioning Program*
For 16 years, the Community Visioning Program has helped rural communities plan transportation enhancements using state funds from the Iowa DOT. To date, 191 Iowa towns have completed the process and collaborated with design teams to create conceptual transportation enhancement plans. Documented impacts of the program since 1996 include:
 - Ninety-four percent of participating communities complete at least one project.
 - Internet research of state funding shows that to date, 124 visioning communities received funding from five state programs to do 285 projects. Seventy-seven percent of the projects were directly related to visioning concept plans and 27% were not directly related to the program.
 - More than \$16.9 million in state funds was awarded to visioning projects and \$12.4 million to non-visioning projects.
 - Estimated cash matches from awardees exceed \$12.6 million for an estimated \$42 million generated.
 - In FY 12, 12 communities completed the visioning process and 12 new communities started the process. ISU contracted with five landscape

architecture firms, which employed 12 ISU design students as interns. Contracts to private sector firms totaled \$204,767.

- *West Liberty Economic Area Development (WE-LEAD)*

WE-LEAD is a nonprofit 501(c)(3) corporation organized in 2006 to create, develop, and maintain strong business relationships, and to establish a climate in which new and existing businesses can flourish. As part of this initiative, the City of West Liberty (75%) and ISU Extension and Outreach Community and Economic Development (CED) (25%) jointly hired a community development specialist.

 - In FY 2012, WE-LEAD trained 200 community leaders, elected officials, youth, industry leaders, and minorities by sponsoring a Chick-fil-A Leadercast event on May 4. WE-LEAD secured cash and in-kind sponsorships totaling \$15,150. With first-year expenses of approximately \$11,000, the event yielded \$4,000 in profit, which will provide the necessary money to sustain the Leadership West Liberty program and create an endowment for sustainability of the program.
 - Leadership West Liberty is a community-focused leadership program designed to grow the next generation of leaders in West Liberty. Thirty-five students have graduated from the five-year-old program. Completion of a community project is a requirement and more than 15 projects have been completed.
 - In 2012, Extension and Outreach CED and the Keokuk Area Chamber of Commerce hired an executive director/extension community development specialist based on the WE-LEAD model.

- *Tourism*

ISU Extension CED specialist Diane Van Wyngarden, PhD. developed a model travel program for Iowa and marketed it to a national audience through Road Scholar. Current programs include: Exploring Uncommon Communities: a Touch of History, a Taste of Utopia; Upper Mississippi River Reflections: Historic Towns, Trails and Tales; and Missouri River Reflections: a Ribbon of Legends through Four States.

 - In FY 2012, 115 people participated in the Road Scholar Program. Tuition is \$1,000 to \$1,500 per participant.
 - In FY 2012 the program affected more than 100 businesses, and the estimated dollar value of those impacts is \$194,692. The program is self-supported, and the money generated goes directly to travel-related businesses along tour routes.

- *Sustainability*

The ISU Extension and Outreach sustainability specialist serves the 9,200 Fairfield residents, as well as southeast Iowa and the state, facilitating community sustainability programs initiated by businesses, industry, and other organizations.

 - Fairfield is participating in the Hometown Rewards Program, a comprehensive, citywide energy efficiency campaign working with Alliant Energy. The sustainability specialist is helping the community develop a two-year program to engage 50% of residents (4,750 people). In FY 2012 more than 400 trees were planted and more than 700 people were trained in tree planting and energy efficiency techniques. Information was

distributed on energy reduction, including audits and pledges, and the website was revamped. A loan loss reserve fund was set up to put \$4 million in potential loans into the community.

- In FY 2012, 523 citizens attended Backyard Conservation Workshops, resulting in 17 new beehives added, 15 new farmers' market vendors, 12 contractors trained in energy efficiency, 60 people interested in backyard chickens, 15 solar panels built, and 1,500 fruit trees sold.
- Fifteen nonprofit employees were trained as part of an ongoing process to develop a sustainability plan for Youth and Shelter Services in Des Moines, which serves more than 10,000 people.

➤ *Latino Business and Community Development*

ISU Extension and Outreach Community and Economic Development currently employs one Spanish-speaking community development specialist based in Ottumwa. This specialist is responsible for Latino business and community development for the entire state. However, in light of the increasing demand for these types of services, CED submitted a proposal for a 2012 VPEO strategic initiatives grant to fund a new community development specialist with expertise in minority businesses and leadership. The proposal was funded and the search for the position is nearly complete. The new community development specialist will be based at the Town/Craft center in Perry.

During the past year, CED specialists trained 32 Latino business leaders and entrepreneurs, helped 18 minority entrepreneurs start or improve their businesses, and assisted with the creation of 13 jobs and the retention of 100 jobs for minority employees. Community development specialist Himar Hernández maintains contacts with Latino business owners throughout the state and has facilitated the development of Latino business networks in southeast and central Iowa.

CED partnered with the University of Minnesota to develop a proposal to assess the financing and technical assistance needs of underserved entrepreneurs and identify barriers separating them from providers of those services. The proposal, titled "Helping nonmetro communities and underserved entrepreneurs grow together," was funded by the North Central Regional Center for Rural Development through a grant competition. The project began with a two-day roundtable discussion at the Town/Craft center in Perry, a community with a population that is 35% Latino. The outcome of the project will be a proposal to develop, pilot, and implement new curricula for Extension professionals to use in working with underserved entrepreneurs, financial institutions, and technical assistance providers in nonmetro areas.

➤ *Office of State and Local Government Programs*

The Office of State and Local Government Programs offered several training opportunities to local government leaders and officials. With the addition of Extension program specialist Cindy Kendall, OSLGP has been able to offer more training in fiscal and budget management.

- 297 local government representatives attended the Municipal Leadership Academy Parts One and Two in November and December 2011.
- 620 local government fiscal officers attended Budget Seminars in fall 2011.

- The OSLGP hosted the 2011 Annual Finance Report training webinar, which was attended by 30 participants.
- The 2011 Municipal Professionals Institute and Academy were held in Ames July 18–29 for 264 municipal professionals.
- In FY 2012, 247 local officials attended Introduction to Planning and Zoning workshops.

➤ *Housing Needs Assessment after a Local Disaster*

In light of the 2008 floods and other recent natural disasters, the Iowa Economic Development Authority (formerly the Iowa Department of Economic Development), the Iowa Finance Authority, and the Rebuild Iowa Office engaged Iowa State University and ISU Extension and Outreach Community and Economic Development to undertake a study of eight communities heavily impacted by the 2008 floods. The purpose of the study was to gain an understanding of how recovery program implementation differed by the size and type of community and to identify the unique challenges these communities encountered in their recent experiences with housing loss caused by a natural disaster. A mixed method research project was conducted on eight communities affected by the 2008 floods: Cedar Rapids, Charles City, Columbus Junction, Coralville, Iowa City, Mason City, Waverly and Waterloo. Six major issues emerged from the study:

1. Economic impact analysis revealed that the recession has had a greater economic impact on the study communities than the 2008 floods.
2. Only four of the eight study communities have a statistical need for more housing.
3. Municipal and nonprofit capacity in case management and outreach services is needed for recovery programs to operate effectively.
4. Disaster recovery programs can be created before a natural disaster and legislatively funded when a disaster response is needed.
5. Accurate and accessible data are needed for local decision-making and long-term planning.
6. The housing market gap should be evaluated by units lost and by the difference in value of replacement housing.

The results of the study were published in a comprehensive report as well as individual reports for each study community. Based on the study findings, ISU Extension CED trained representatives from the councils of government on pre- and post-disaster planning strategies.

➤ *Local and Regional Housing Trust Funds*

The Iowa Finance Authority (IFA) administers a state housing trust fund offering forgivable loans to rehabilitate existing housing; however, many Iowa communities do not have the structure in place to apply for and administer such loans. Through an agreement with IFA, ISU Extension and Outreach CED is helping communities, counties, and regions develop local housing trust funds (LHTF), with which they can apply for seed money from the state to use for affordable housing.

Existing housing trust funds cover 52% of Iowa's population. Primary clientele include counties and regional COGs. Extension CED has incorporated the LHTF development format into regional housing trust fund development. In FY 2012, 14

county and regional housing trust funds received \$2,561,110 in state affordable housing grants.

- *Consultations with Farmers and Agribusinesses*
Agricultural and Natural Resources (ANR) Extension and Outreach provided 8,594 individual consultations with farmers and agribusinesses. These one-on-one consultations at the client's requests included trouble-shooting on crop and livestock production, advice on financial and strategic management and input on investment decisions.
- *Dairy Profitability Education*
The ANR Dairy Team contacted 20 dairy producers who participated in a dairy profitability educational meeting were compared to producers who did not attend the event, using the Dairy Herd Improvement Association records. The evaluation was conducted one year after the event. Those who attended increased revenue an average of \$40,961 per herd or a total of \$1.6 million per year compared to herds that did not participate, based on improved milk production and milk quality premiums.
- *Lowering Costs for Beef Producers*
The ANR Iowa Beef Center cow nutrition program worked with beef producers to significantly reduce their overall cost of production. Of the attendees surveyed six months after the event, 28% indicated they reduced their feed costs by \$1,250. Based on the attendance, this resulted in \$136,500 in reduced costs or increased profits. With the 2.59 economic output factor, this results, conservatively, in \$353,535 in additional revenue in rural economies.
- *Pesticide Applicator Certification*
The ANR Pest Management and Environment program served 3,122 Iowa businesses last year by providing the required training for their approximately 8,000 employees to receive or maintain pesticide applicator certification. The training, required by the Iowa Department of Agriculture and Land Stewardship, addresses worker and customer safety, regulations, and environmental protection.
- *Manure Applicator Certification*
The ANR Manure Applicator Certification program served 580 Iowa businesses last year by providing the required training for their 2,400 employees and managers to receive or maintain Iowa manure applicator certification. The training, required by the Department of Natural Resources, addresses worker safety, regulation, and environmental protection issues.
- *Workshops for Technical Service Providers*
ANR delivered three workshops titled RUSLE2 and Iowa Phosphorus Index to technical service providers in Iowa. A total of 49 workshop evaluations were received. Those reporting worked with or managed approximately 475,000 acres and 1,009 clients on an annual basis. They also reported developing more than 1,000 nutrient management plans annually. Participants indicated an average gain from completing the training of \$301 per client serviced or \$0.47 per acre serviced. The overall average gain was reported as more than \$3,600 per participant.

- *Business Feasibility Studies and Market Analysis*
The Value Added Agriculture Program at Iowa State University Extension and Outreach conducted 10 full business feasibility studies, examining in-depth the economic, market, technical, management, and financial aspects of a proposed business start-up or expansion. Total capital investments by these businesses moving forward totaled \$77,920,000, with gross revenues of \$84,824,000 and payrolls of \$11,570,000. Additionally, staff conducted five market analysis studies for businesses in Iowa. Market analyses done by VAAP focus on businesses expanding rural development in Iowa. These market analyses had direct capital investments of more than \$12 million to Iowa's economy and an estimated payroll of \$880,000 to Iowans.
- *Value Added Agriculture - Technical Assistance*
Staff with the Value Added Agriculture Program of Iowa State University Extension and Outreach provided direct technical assistance to 44 businesses on a variety of topics, including vineyard/winery feasibility, food safety planning/GAPs certification, local foods and agritourism, organizational structure, specialty crops, and business feasibility. This assistance enabled 44 businesses to continue operations and maintain or grow personnel, resulting in new or retained jobs for Iowans. Businesses ranged from sole proprietorships to cooperatives to limited liability corporations.
- *Value Added Agriculture - Support Team*
The Value Added Agriculture Program at Iowa State University Extension and Outreach sits on the Value Added Agriculture Support Team (VAAST), a working group created to assist in the development of value-added ag projects. Members include six state agencies, various commodity groups, and farm membership organizations. These members and their collective resources provide technical and financial assistance to emerging value-added ag businesses and initiatives. Meetings offer an opportunity to these emerging businesses to visit with the entire VAAST group at one setting. This process speeds up the initial steps needed to develop a business. During 2011, VAAST met with 10 businesses. Collectively, VAAST aids these businesses in access to capital, facilitates planning, and zoning requirements, and pools resources to facilitate rural entrepreneurship and economic development.
- *Value Added Agriculture/ISU Grain Quality Lab*
ISU Value Added Agriculture Program and ISU Grain Quality Lab work together to offer assistance to grain handlers and processors in inventory management and quality control. Key to both operations is accurate and rapid measurement of nutrient and quality factors of inbound grain and outbound products. This year, VAAP and the lab have helped a food-grade soybean processing company by developing initial calibrations for their near infrared grain analyzer and training their research director to update and develop future calibrations. Similarly, VAAP and the lab worked with two large grain cooperatives to develop and update near infrared analyzer calibrations for their feed mills, mainly for the purpose of checking nutrient levels in inbound ingredients. In either case, accurate quality measurements help companies more efficiently use ingredients to meet contract specifications in their outbound products. Efficiencies translate into cost savings, in part due to the ability to evaluate suppliers' quality standards.

ISU Value Added Agriculture Program and ISU Grain Quality Lab also assisted two near infrared analyzer manufacturers to evaluate new instrument prototypes intended to measure nutrients and other quality factors in Midwest grains. Each company has moved ahead with calibration and standardization algorithms developed by ISU for certification by the National Type Evaluation Program within the National Institute of Standards and Testing. Increased competition in the analyzer-sales industry has led to more uniform testing and cost savings. Rapid measurement ability ultimately leads to improved quality and fairer trade.

➤ *STEM Skills for Iowa's Future Workforce*

In order for Iowa youth to be successful in the 21st century, they must be prepared with science, technology, engineering, and math (STEM) skills necessary to meet Iowa's workforce needs and economic development plans. Iowa State University Extension and Outreach's 4-H Youth Development program, in partnership with many local and national organizations and businesses, provided STEM opportunities for youth in every Iowa county. These programs inspire and prepare today's youth to become science literate citizens and meet future Iowa workforce needs. ISU Extension and Outreach plays a vital role in filling the STEM pipeline for Iowa companies. 4-H provides leadership for pre-collegiate (K – 12) STEM outreach, including the State Science and Technology Fair of Iowa, 4-H STEM projects and exhibits, STEM Camps, County STEM programming, 4-H STEM special events at the Iowa State Fair, Iowa 4-H State Technology Team, and STEM focused 4-H clubs. In FY12, 650 6th through 12th grade students participated in the State Science and Technology Fair of Iowa. County Extension and Outreach programs engaged 35,258 participants in STEM focused programs or 4-H STEM projects ranging from environmental stewardship to geospatial mapping – from which 77 STEM exhibits advanced to the Iowa State Fair. In addition, 68 youth participated in STEM events at the Iowa State Fair, 22 participated in the Iowa 4-H State Technology Team, and 85 youth participated in STEM camps at the Iowa 4-H Center.

➤ *Volunteer Income Tax Assistance Helps Families Build Financial Security*

The Earned Income Tax Credit (EITC) augments the wages of low- and moderate-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 that exceeds the size of the original refund. This money strengthens neighborhoods, assists small businesses, and spurs local economic development. ISU Extension and Outreach worked with community partners to recruit and train 60 volunteers to provide free tax preparation services to low- and moderate-income families through the Volunteer Income Tax Assistance (VITA) program. In 2012, VITA volunteers working at 34 VITA sites helped 1,621 low- and moderate-income Iowans complete income tax returns. Special efforts were made to increase awareness of the EITC and VITA in rural Iowa. As a result, 795 filers qualified for the EITC and received \$1,091,572 in the 29 counties that participated in the Extension-community partnerships to expand VITA programs in rural Iowa.

➤ *Early Childhood Programs*

The Better Kid Care New Staff Orientation program has been adopted by Iowa as a key component for stabilizing workforce turnover and providing a basic level of

knowledge for new early childhood teachers and assistant teachers who may have limited education and experience. This outstanding program provides new teachers with 30-lessons over a four-month period. Teachers view DVD demonstrations, practice and fulfill on-site activities and complete workbook lessons, which are sent into Iowa State University for review. Currently 225 centers and preschools (15% of Iowa licensed programs) participate in the Better Kid Care New Staff Orientation (NSO) program. As a result of participating in the NSO program, 678 child care center staff teachers have completed a total of 10,848 training hours and 116 child care center directors completed 696 training hours. All report making significant gains in knowledge and program improvements.

NSO program data indicate that 4,934 individuals completed Better Kid Care New Staff Orientation and 1,286 directors have participated in the NSO Directors' Training since the program's inception in 2007.

- *ServSafe*[®]
Iowa State University Extension and Outreach Nutrition and Health Specialists are registered instructors for the National Restaurant Association's Educational Foundation's internationally recognized food safety certification program. ISU Extension and Outreach Specialists have taught the *ServSafe*[®] food safety certification program for more than 15 years. From July 1, 2011 through June 30, 2012, more than 1,000 Iowans participated in an ISU Extension and Outreach taught *ServSafe*[®] course, with 92% successfully earning certification. Of the 1,098 participants, about 60% were from for-profit commercial operations that prepared and/or sold food to people away from home. Commercial operations recognize the value of training staff in safe food handling procedures, as an incidence of a foodborne illness can be devastating for business. Other participants were involved in foodservices in non-profit operations, such as schools, hospitals, and nursing homes. Proper preparation, holding and service of food is critical in these locations, as participants in these meal programs are frequently considered at greater risk of contracting a foodborne illness due to compromised immune systems.

The Office of the Vice President for Research and Economic Development 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 VPRED) coordinates ISU research, technology transfer, and economic development activities. Members meet periodically 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 units within the VPRED office have been focusing on increased coordination. The technology transfer associates, industry contract negotiators, and industry

relations professionals have all been co-located in the same building to facilitate a team-based approach.

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 collaborated with UNI and the U of I on an NSF EPSCoR proposal that received funding (\$20 M) in September 2011. The grant develops a statewide energy plan for the State of Iowa, covering two renewable energy platforms--wind and bioenergy-- a third platform dealing with energy efficiency, and a fourth platform on energy policy. The ultimate outcome will be an energy plan leading to energy efficiency and sustainability for the state. Other partners include the Iowa Economic Development Authority, the Iowa Energy Center, community colleges and other four-year institutions in Iowa, and industry.

Economic Development

The state is providing the Regent universities with financial resources to expand technology transfer and commercialization efforts. In addition, limited funds are provided for core support for infrastructure in the Research Park, Pappajohn Center, and the VPRED office. Each year, projects are funded that pair ISU researchers and Iowa companies. More information appears later in this report (Appendix 1).

Innovate Iowa Proof of Concept Initiative

Iowa State has established an initiative that focuses on increasing the transfer of technology while reducing the time to commercialize. Technology and business development will occur in parallel by engaging staff from the ISU Research Foundation, the ISU Research Park, the Pappajohn Center for Entrepreneurship, and technology experts. This initiative will provide a single, visible interface for faculty, staff, and students seeking opportunities and provide simplified, coordinated communication. This is a collaborative effort with the Iowa Innovation Corporation. The Board of Regents institutions are currently assessing Proof of Concept programs across the system with the intent of partnering and strengthening the process.

A reinvigorated process for prospect development and startup company acceleration

A Research and Economic Development Council Committee chaired by Steve Carter, director of the ISU Research Park and the Pappajohn Center for Entrepreneurship, is engaged in a strategic partnership to reinvigorate and leverage the university's approach to building a collaborative, university-wide network that engages students, staff, and faculty in entrepreneurial startup activities. This process is broad-based and inclusive,

with discussion taking place campus-wide (Center for Biorenewable Chemicals, Bioeconomy Institute, colleges' entrepreneurial programs, ISU Research Foundation, ISU Research Park, Pappajohn Center for Entrepreneurship, etc.).

State-wide committees

Many people from ISU serve on committees that promote economic development programs, such as the Iowa Innovation Council, the Iowa Innovation Corporation, the Biosciences Alliance of Iowa, the Iowa Innovation Council's Iowa Advanced Manufacturing Committee, Iowa Meat Processors Association, Institute of Food Technologists-Iowa Section, the Iowa Lean Consortium, the Partnership for Industrial Energy Efficiency, Professional Developers of Iowa, the Iowa Business Council, the Iowa Alliance for Wind Innovation and Novel Development (IAWIND), Innovate Iowa!, and Capital Crossroads.

5. Please provide the following information about Grow Iowa Values Fund projects for FY 2012:
- A. Identify and briefly describe each project or initiative which received GIVF funding in FY 2012 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 2012
 - C. Provide a description of the sources of the matching institutional dollars for each GIVF-funded project

The Regents Innovation Fund (formerly 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** for a complete report.

6. 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.

6A. Availability of startup and venture capital for technology entrepreneurs

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. Iowa State University has established a Proof of Concept Initiative (POCI) to fill a portion of the funding gap created by the loss of Values Funds. The POCI provides very early stage funding and commercialization assistance to researchers with promising discoveries.

Iowa has multiple seed funds, most of which are regional with varying capabilities or capacity to make investments. The Wellmark Fund has also provided early-stage capital to early-stage companies.

There remain several challenges to overcome. 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 to start up and

rapidly grow technology and innovation-based firms. In addition, 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, and this is a major problem in Iowa. Firms must look outside the state for significant investments of more than \$5 million. As always, really good businesses with really good management teams will attract money; developing experienced and skilled management teams remains a major challenge.

6B. 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.

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.** In FY11, the legislature appropriated \$994,930 to the SBDC. In FY12 the state line item appropriation was reduced to \$936,345, with a further reduction in FY13 to \$735,728. In addition, the \$105,000 the program received from the Grow Iowa Values Fund in FY12 was eliminated for FY13 along with the GIVF program (the original allocation had been \$355,000). Iowa State University contributed \$200,617 in ISU funds and \$105,000 in Regents Innovation funds to bring the program up to its FY12 funding level for FY13. Total state resource dollars directed to the program for FY13 is \$1,041,345, down from \$1,260,929 in FY09.

As demonstrated by Professor Chrisman's study of only a narrow segment of SBDC clients, for every Iowa tax dollar spent on the Small Business Development Center program, over \$2.00 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 an increase in tax revenues over tax expenditures.

- **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.
- **ISU Extension and Outreach Center for Industrial Research and Service (CIRAS).** CIRAS has successfully leveraged its state budget to bring in additional federal grants and fees to expand technical assistance, education programs, and economic development studies to support Iowa businesses. In FY12, CIRAS helped generate an additional \$2.86 for each \$1 of state funds provided, yielding approximately \$4 million of additional funding. More than \$1 million of CIRAS

funds were distributed to other business outreach units on campus to help them expand their work with Iowa companies.

CIRAS has lost more than \$1.6 million (in 2012 dollars) from its 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, including salary and fringe benefits, and associated expenses. 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 staff positions might have generated nearly \$60 million of impact and more than 700 jobs in Iowa companies — every 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 \$150,000 from grants and fees and hire two new business professionals to provide services in the areas of engineering, biobased products and biorenewables, energy systems, management practices, government contracting, productivity, growth services, supply chains, quality systems, and community-business economic development. These two staff would help create nearly 50 jobs and \$5,000,000 of new sales, cost savings, and investment impact in Iowa companies.

- **Institute for Physical Research and Technology (IPRT).** The IPRT economic development programs suffered losses of over \$500,000 over the past three years. These losses follow \$2,500,000 in budget cuts in 2003, which were never restored. These cuts came at times when the need for IPRT's expertise by Iowa industries was rapidly growing. Although pieces of the program have survived the cuts, the program now serves only a fraction of the Iowa companies it once served. There has been a complete turnover in Company Assistance Research Cost-Sharing staff due to funding instability, with the concomitant decrease in efficiency as new staff are hired and trained. Companies seeking help outside the core competencies of the IPRT Company Assistance staff often cannot be assisted. In the past these potential clients were guided to work with faculty members through 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 because of the declining funding. Over 75% of the Iowa manufacturers that IPRT serves have fewer than 100 employees. This means that the typical industrial client will likely not have the needed expertise internally to address their material and inspection issues.

The Materials Group 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 the program's delivery of services. The unit seeks to offer a wider scope of services directly meeting the needs of Iowa manufacturers.

The NDE (Nondestructive Evaluation) Group 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 NDE Group in effect complements the engineering capabilities of their clients. The unit 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.

The Company Assistance Research Cost-Sharing Program administers cost-sharing contract research projects, working with Iowa's small to medium-sized manufacturers. These small companies have very limited R&D 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. Before the budget cuts of the last several years, the staff proactively marketed the R&D strengths of ISU's faculty to potential Iowa industry partners. This outreach effort was eliminated because of constraints on staff time and funds available for these projects, with a resultant decrease in the number of projects funded

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 startup 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 would result in continuing benefits to Iowa's companies, important opportunities to retain our brightest students, and new startup companies based on increased technology transfer from IPRT centers.



University of Northern Iowa Annual Economic Development and Technology Transfer Report FY 2012

Section 1. UNI's Economic Development Activities to Enhance Economic Growth in Iowa

As was the case for the nation as a whole, the economy of Iowa experienced a mixed year. Similarly, some UNI programs experienced substantial growth, while others were challenged by slower economic growth in certain sectors. Even with reduced public funding, UNI economic development programs made substantial contributions to the Iowa economy, especially in the areas of entrepreneurship and innovation. This annual report highlights some of the impacts realized across the state with the help of UNI programs during FY 2012.

Overall

- Provided service in all 99 counties to nearly 885 unique business, community and local government clients; another 10,900 individuals were engaged in the MyEntre.Net entrepreneurial support system.
- Involved 202 faculty members and more than 2,400 students in the delivery of these services.
- Leveraged each \$1 invested by the state with \$5 in private grants, fees or federal funding.

Entrepreneurship, Business Incubation and Technology Transfer

- UNI's 3 incubator/accelerator programs and MyEntre.Net helped start or expand 266 ventures creating 481 FTE jobs.
- 10,900 individuals are now actively engaged in the MyEntre.Net online community.
- 53 innovators have graduated from the Innovation Incubator and 4th Street Incubator.
- MyEntre.Net provided on-demand business and market information to 377 businesses through its new Business Concierge service; another 184 clients were served by the UNI SBDC.
- 22 student businesses were tenants in the John Pappajohn Entrepreneurial Center's Student Business Incubator and 41 additional student entrepreneurs were assisted by the affiliate program.
- One of the UNI John Pappajohn Center's student incubator tenants was selected as National Student Entrepreneur of the Year by the Collegiate Entrepreneurs Organization.
- UNI faculty and staff submitted 9 new intellectual property disclosures.
- 2 patents were received and 7 new patents were filed.
- 3 new license agreements were approved and a total of 10 license agreements are currently generating income.



Waste Reduction, Environmental Assistance and the Bioeconomy

- Environmental technical assistance and on-site reviews were provided to 168 small businesses.
- The GeoTREE program worked in conjunction with multiple state and local agencies, using geospatial mapping to identify solutions to specific problems including energy efficiency and watershed management.
- Recycling and reuse project funding was provided to 47 companies and organizations; another 160 individuals were provided testing assistance for products using recycled materials.
- Energy and environmental education programming reached 26,486 K-12 students.
- The Tallgrass Prairie Center distributed native prairie seeds to 55 Iowa counties as part of its roadside vegetation project.
- The Tallgrass Prairie Center continued research on biomass production from prairie grasses.
- Green Iowa AmeriCorps sites combined to weatherize 114 homes and educate 13,000 persons about energy efficiency.
- NABL completed research with the US Department of Navy to develop biobased lubricant specifications for military use.
- NABL developed a microwave biobased grease manufacturing process and licensed the technology to an Iowa company.

Local Economic Development

- IDM partnered with Iowa Workforce Development to complete statewide asset mapping.
- Community clients report creating approximately 1,500 jobs as a result of local economic development technical assistance from the Institute for Decision Making (IDM).
- Strategic planning and comprehensive technical assistance was provided to 25 community partners and 4 regional groups.
- Restructuring of Iowa's regions was led by IDM in collaboration with Professional Developers of Iowa.

Advanced Manufacturing & Market Research

- MCC provided custom technical assistance and outreach services to 24 foundries and suppliers.
- Continued sponsored research was conducted into biobased foundry binder systems resulting in license agreements and patent submissions.
- Market research and competitive intelligence was provided to 6 Iowa companies and 15 national companies.
- Market research clients report an average sales increase of 14%, due in part to the competitive intelligence information provided by UNI.



Section 2. Technology Transfer and Intellectual Property

FY 2012

	UNI
a. Number of disclosures of intellectual property	9
b. Number of patent applications filed	7
c. Number of patents awarded	2
d. Number of license and option agreements executed on institutional intellectual property	3
e. Number of license and option agreements yielding income	10
f. Revenue to Iowa companies as a result of licensed technologies	\$2,625,000
g. Number of start-up companies formed, in total and in Iowa	73/73
h. Number of companies in research parks and incubators	24
i. Number of <u>new</u> companies in research parks and incubators	16
j. Number of employees in companies in research parks and incubators	49
k. Royalties/license fee income	\$209,823
l. Total sponsored funding	\$43,000,000
m. Corporate-sponsored funding for research and economic development and revenue generation (excludes corporate philanthropy - all in Iowa)	\$1,266,031
n. i. Annual appropriations for economic development	\$574,716
ii. Grow Iowa values appropriation	\$238,000

Section 3. Overview of UNI’s Economic Development Programs

UNI outreach services for community and economic development activities are outlined in a table format on the following seven pages. The format provides a brief overview of each program, its purpose, those served and outcomes. Together, the programs served approximately 885 unique businesses and organizations in the past year and another 10,900 individuals through the MyEntre.Net entrepreneurial development system.



Section 3. Overview of UNI's Economic Development Programs (continued)

Programs	Services	Those Typically Served	FY 2012 Results	Cumulative Results
Institute for Decision Making (IDM)	Hands-on community and economic development guidance and research	Economic development organizations, chambers, city councils, communities and others	<ul style="list-style-type: none"> ✓ Developed first collaborative water quality plan for Department of Natural Resources. ✓ Assistance and research provided to 25 community partners and 4 regional development groups. ✓ Partnered with Iowa Workforce Development for statewide asset mapping. 	<ul style="list-style-type: none"> ✓ Served 680 communities, counties and groups in nearly all of Iowa's counties to date. ✓ Community clients report approximately 1,500 new jobs annually as a result of IDM assistance. ✓ Trained over 780 economic development professionals.
Iowa Waste Reduction Center (IWRC)	Free, confidential, non-regulatory environmental assistance for small businesses	Small businesses throughout Iowa	<ul style="list-style-type: none"> ✓ Environmental technical assistance and on-site reviews were provided to 168 small businesses. 	<ul style="list-style-type: none"> ✓ Provided 5,397 on-site reviews to Iowa small businesses.
National Ag-Based Lubricants (NABL) Center	Biobased lubricants research & development, testing services laboratory, development of performance standards, bio-lubricant product certification, and lubricant mfg. process research	Companies and individuals developing biobased lubricants, traditional lubricant companies, and lubricant consumers	<ul style="list-style-type: none"> ✓ Completed multi-year research contract for U.S. Dept. of Navy. ✓ Developed and licensed a new microwave-based grease manufacturing process to Cedar Rapids industry partner. ✓ Added additional diesel engine testing resources; improving test cell capability. ✓ Provided fee-based testing services to industry clients. 	<ul style="list-style-type: none"> ✓ Licensed microwave-based grease manufacturing technology to industry. ✓ Over 40 soy lubricants, greases, metalworking fluids and specialty lubricants developed to date. ✓ A national testing and certification center, leading the biobased lubricants industry.



Section 3. Overview of UNI's Economic Development Programs (continued)

Programs	Services	Those Typically Served	FY 2012 Results	Cumulative Results
Strategic Marketing Services (SMS)	Market research and competitive intelligence	Businesses, entrepreneurs and non-profit organizations	<ul style="list-style-type: none"> ✓ Market research and analysis services were provided to 6 Iowa companies and 15 national companies. 	<ul style="list-style-type: none"> ✓ Since 1990, market research and analysis services have been provided to 262 Iowa companies.
Executive Development Center (EDC)	Management and professional training workshops and certificate programs	Iowa businesses and organizations	<ul style="list-style-type: none"> ✓ Specialized business management training provided in 60 workshops to 277 business professionals in 45 businesses during the past year. 	<ul style="list-style-type: none"> ✓ Since 1998, has provided training in 1,080 workshops to 17,855 business professionals.
John Pappajohn Entrepreneurial Center (JPEC)	Research, entrepreneurship education, technology transfer, and capital investment programs	Students interested in entrepreneurship, UNI faculty and staff entrepreneurs, new ventures and rapidly growing small companies	<ul style="list-style-type: none"> ✓ One UNI student entrepreneur was named Student Entrepreneur of the Year by the Young Entrepreneur Council/Collegiate Entrepreneurs' Organization (a national award). ✓ 1,298 businesses and individuals were assisted through all JPEC programs. ✓ 22 student businesses owners were provided space and services in the student business incubator. ✓ 41 student business owners were provided services as part of the student business affiliate incubator program. 	<ul style="list-style-type: none"> ✓ The JPEC has provided 35 students with internships through its CIPCO program since FY05. ✓ The JPEC Student Business Incubator has provided space to more than 59 business owners since FY05. ✓ The JPEC has consulted with 196 faculty and staff from colleges and universities from around the U.S. and the world on student business incubation since FY08. ✓ The Cedar Valley Venture Fund, managed by JPEC, has invested in 7 new ventures.



Section 3. Overview of UNI's Economic Development Programs (continued)

Programs	Services	Those Typically Served	FY 2012 Results	Cumulative Results
UNI Regional Business Center/ Small Business Development Center (RBC/SBDC)	Rural/Urban Entrepreneurship development, online entrepreneurship resources, business consulting, business training, business incubation	Small and medium sized businesses, entrepreneurs, entrepreneurial service providers, community leaders	<ul style="list-style-type: none"> ✓ MyEntre.Net membership grew by 2,000 to 11,403 (10,900 in Iowa). ✓ The MyEntre.Net Business Concierge was created, providing business intelligence to 377 off campus clients. ✓ 1,292 attended a live or archived webinar. ✓ 225 attendees at EntreFest in Ames, Iowa. ✓ Dream Big Grow Here attracted 142 contestants online to compete for up to \$15K in cash awards. ✓ Entrepreneurs from 92 of 99 Iowa counties participated in the Fall 2011 Small Business Survey. 	<ul style="list-style-type: none"> ✓ Engaged more than 11,400 small business owners at MyEntre.Net. ✓ More than 3,200 small business owners have attended a Webinar since 2003. ✓ 53 innovators have graduated from the RBC and Innovation Incubators.
Materials Innovation Service (MIS)	Mechanical, physical and chemical tests of metals, polymers and cementitious materials	Serving Iowa manufacturers and suppliers	<ul style="list-style-type: none"> ✓ Technical assistance provided to more than 160 individuals and testing contracts from five companies. 	<ul style="list-style-type: none"> ✓ More than 2,000 hours of testing provided since the beginning of the program.
Metal Castings Center (MCC) and Center for Advanced Biobased Foundry Binders (CABB)	Metal casting technologies, applied research, testing and training	Iowa casting users, foundries and foundry suppliers	<ul style="list-style-type: none"> ✓ Maintained active contracts with 24 companies, provided outreach projects to 2 Iowa foundries and technical assistance to 30 additional foundries. ✓ Conducted DOE-sponsored research into bio-based foundry binders – 2 patents submitted. ✓ Successfully commercialized bio-based foundry binders. 	<ul style="list-style-type: none"> ✓ Over 50 industry-funded research projects have been completed to date.



Section 3. Overview of UNI's Economic Development Programs (continued)

Programs	Services	Those Typically Served	FY 2012 Results	Cumulative Results
			<ul style="list-style-type: none"> ✓ Collaborated with University of Iowa and Iowa State on DOD-sponsored research. 	
<p>Iowa Center for Immigrant Leadership and Integration (ICILI)</p>	<p>Helping Iowa communities and businesses accommodate the needs of newcomers</p>	<p>Communities, faith-based organizations and businesses</p>	<ul style="list-style-type: none"> ✓ Created a colorectal cancer awareness campaign for Asian immigrants. ✓ Provided an increased number of trainings for law enforcement officials. ✓ Award multi-year contract to address disparities in Iowa's child welfare system. 	<ul style="list-style-type: none"> ✓ Assistance in accommodating the needs of newcomers has been provided to more than 200 Iowa companies and organization. ✓ More than 25,000 copies of four different guides/manuals (and untold electronic copies) have been distributed in Iowa.
<p>Tallgrass Prairie Center (TPC)</p>	<p>Research, techniques, education and source-identified seed for restoration and preservation of native vegetation</p>	<p>Iowa counties, state and federal agencies, commercial native seed producers, the community, students, educators, restoration ecology discipline, and others</p>	<ul style="list-style-type: none"> ✓ Native seed distributed to 55 counties in Iowa via transportation enhancement funding. ✓ Completed and distributed IRVM Manual. ✓ Continued <i>Carex</i> germination research and agronomic production of <i>Carex</i> seed. ✓ Published overview of prairie restoration ✓ Published results of prairie forb establishment after ten years. ✓ Continued research on wildlife response to prairie biomass production. 	<ul style="list-style-type: none"> ✓ More than 15,500 acres of Iowa counties rights-of-way have been restored to native vegetation. ✓ Increased public knowledge regarding prairie. ✓ Completed publication of Proceedings of 22nd North American Prairie Conf. ✓ Made research information available to restoration ecology community. ✓ Made <i>Carex</i> available to native seed growers.



Section 3. Overview of UNI's Economic Development Programs (continued)

Programs	Services	Those Typically Served	FY 2012 Results	Cumulative Results
Center for Energy and Environmental Education (CEEE)	Technical assistance, educational programs and leadership in energy conservation and renewable energy, environmental conservation and community-based agriculture	Iowa cities, counties, Iowa schools, teachers, farmers, businesses, elected officials, state agencies, community leaders, citizen organizations	<ul style="list-style-type: none"> ✓ Green Iowa AmeriCorps sites combined to weatherize 114 homes, conducted 175 education programs with over 13,000 people in attendance, implemented 325 team projects, and garnered over 7,325 volunteer hours. ✓ The CEEE FREE loan program increased the understanding of energy for 11,895 students, 112 adults, and 299 teachers. ✓ Buy Fresh, Buy Local participating restaurants and institutional buyers in the Black Hawk county area spent \$2.65 million on locally grown foods. ✓ Trained and mentored 58 Iowa teachers, working with 3,000 students K-14 in environmental issues instruction. ✓ Iowa Farm Energy Working Group helped reduce fossil fuel for 200 farmers/Iowans. ✓ In 2012, CEEE's waste reduction initiative reached 391 teachers and they, in turn, reached about 7,500 students, helping them understand concepts such as life cycles and waste prevention. 	<ul style="list-style-type: none"> ✓ Green Iowa AmeriCorps has weatherized 365 homes, conducted 250 education programs that reached over 17,000 people. Nearly 23,000 homes have been provided with energy efficiency advice/improvements and over 7,400 volunteers have been recruited since the program opened its doors in January of 2009. ✓ Since 1998, CEEE's Northern Iowa Food & Farm Partnership has facilitated purchase of \$12.5 million worth of meat and produce from hundreds of area farmers by food vending institutions.



Section 3. Overview of UNI's Economic Development Programs (continued)

Programs	Services	Those Typically Served	FY 2012 Results	Cumulative Results
Recycling and Reuse Technology Transfer Center (RRTTC)	Recycling and by-products research, education and outreach	Serving Iowa businesses the recycling industry and Iowa citizens.	<ul style="list-style-type: none"> ✓ Research project funding and outreach services related to recycling and reuse have been provided to 47 companies and organizations. 	<ul style="list-style-type: none"> ✓ Over 42 RRTTC funded research projects. Over 170 reports and publications available. ✓ Outreach provided to more than 3,500 individuals this year, including business/industry, K-12 students, teachers, and Iowa citizens.
Materials Innovation Service (MIS)	Mechanical, physical and chemical tests of metals, polymers and cementitious materials	Serving Iowa manufacturers and suppliers	<ul style="list-style-type: none"> ✓ Technical assistance provided to more than 160 individuals and testing contracts from five companies. 	<ul style="list-style-type: none"> ✓ More than 2,000 hours of testing provided since the beginning of the program.
Geoinformatics Training, Research, Education and Extension Center (GeoTREE)	Geospatial technologies, education, research, and outreach activities for federal, state, local and tribal agencies	Federal, state, local and tribal (FSLT) government agencies (NASA)	<ul style="list-style-type: none"> ✓ Worked with DNR and Public Health to apply geospatial data to solve problems. ✓ Working with Dubuque River Museum for needed science education. ✓ Working with Cedar Falls Utilities on identifying areas most in need of energy conservation and efficiency assistance. ✓ Working with the City of Cedar Falls on watershed management. ✓ Provided training on Agent-based Modeling, LiDAR, ArcGIS Desktop, Basic HAZUS-MH for Flooding. 	<ul style="list-style-type: none"> ✓ GeoTREE has provided 19 training and educational workshops for approximately 560 federal, state, local and tribal government staff members.



Section 4: Grow Iowa Values Funding Projects

UNI's 2012 Grow Iowa Values Fund (GIVF) Annual Report has been submitted and is on file with the Board of Regents. However, many of the GIVF projects and outcomes have also been incorporated into this annual report.

Section 5: Collaborative Projects

Center for Energy and Environmental Education (CEEE) Connects Teachers to Statewide Initiatives

- The CEEE is outlining ways researchers at UI and ISU can connect with teachers and classrooms through workshops. This is part of the Broader Impacts Committee of EPSCOR.
- CEEE works with the Institute for Transportation at ISU. Teachers in workshops tested web quest modules in their classrooms and provided valuable feedback to the ISU developers.
- CEEE assists the Iowa Energy Bank in promoting their loan program. CEEE loans their 30 foot Power Tower to schools or organizations to motivate the schools and community to learn more about wind and solar power.
- CEEE worked with the Iowa Department of Education to promote Green Schools in Iowa. CEEE was one of 12 programs selected as part of the Governor's STEM initiative.

Metal Casting Center (MCC) Collaborates with ISU and UI

- The MCC is collaborating with the University of Iowa and Iowa State University on a Department of Defense funded project to explore three-dimensional printing of foundry molds. The two universities were subcontracted by UNI to assist in the project utilizing their respective specialties.
- The MCC is collaborating with the University of Iowa on a project funded by the Iowa Energy Center. UNI has been subcontracted to pour castings for UI and assist in the determination of thermo physical properties of foundry insulating materials.
- The MCC is collaborating with the University of Iowa to create computer simulation software that will have the capability to simulate the foundry casting process and predict the amount of hazardous pollutants generated.

IDM Compiles Statewide Data

- LocationOne Information System (LOIS) is a real-time, on-line economic development site selection tool. Local communities, marketing regions, utility providers and the Iowa Economic Development Authority have used this system for ten years to showcase the advantages of business locations in Iowa, and includes community demographics, and available buildings and sites. The system is in compliance with the Site Selection Data Guidelines established by the International Economic Development Council. Given the scope of data in LOIS, the Iowa Economic Development Authority launched a



collaborative effort with the Institute for Decision Making to update the data in the system, which is often considered a daunting task on a statewide basis. The system helps create strong partnerships between all local and regional economic development groups and they state this updated system is critical to their economic development success.

Iowa Waste Reduction Center (IWRC) and Ames Lab Redesign Virtual Painting

- The Iowa Waste Reduction Center (IWRC) is working with U.S. Department of Energy's Simulation, Modeling and Decision Science Program located at the Ames Laboratory and operated by Iowa State University. Phase 1 of the arrangement involved conversion of empirical spray painting data and related models created by the IWRC into a virtual reality software program to enhance the accuracy and effectiveness of the IWRC's Virtual Paint training systems. Phase 2, currently underway, creates a user interface to further enhance the systems' graphics, realism and ease of use. The enhanced Virtual Paint training systems will continue to be used by IWRC painter training programs and Virtual Paint customers as well as marketed to military, industrial, and academic training and technical assistance programs.

Regional Business Center Partnerships Key to Success

Collaborative partnerships continue to drive the most successful programs and services associated with Entrepreneurship Outreach at UNI. Work is underway for two new collaborative ventures in the coming year, including an innovative partnership between UNI's MyEntre.Net and IEDA's IASourcelink and a new Economic Gardening pilot project which will foster collaboration between IEDA and a dozen economic development organizations in the state. Two of the current and ongoing collaborations include:

- **Dream Big Grow Here:** UNI Entrepreneurship Outreach, the Iowa Bankers Association, the Technology Association of Iowa, Renew Rural Iowa, the Iowa Economic Development Authority, the Community Vitality Center, Delta Dental and ten regional economic development organizations statewide are partnering to conduct the second Dream Big Grow Here contest. The first year attracted more than 100,000 visitors and tens of thousands of online votes and comments supporting Iowa small business owners. The number of regionally sponsored contests has increased this year from six to ten, representing two-thirds of all Iowa counties, and hundreds of small business contestants are expected to compete for up to \$15,000 in winnings.
- **EntreFest:** UNI Entrepreneurship Outreach, Iowa Area Development Group, Black Hills Utility, MidAmerican Energy, Iowa Farm Bureau, ISU Community Vitality Center, Iowa Bankers Association, Alliant Energy, Iowa Small Business Development Centers, Targeted Small Business Program (IEDA), UNI John Pappajohn Center, Wells Fargo, ISU College of Business, Business and Community Services UNI, Des Moines Area Community College, Brown Winnick Law Firm, Ames Chamber of Commerce, and



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Association of Business and Industry worked in partnership to sponsor EntreFest!, Iowa's conference for small businesses. Celebrating its 5th year, EntreFest 2012 was hosted in Ames, Iowa attracting 225 small business owners. New this year was the energizing pitch-off among Dream Big Grow Here regional contest winners, all vying for a \$10,000 grand prize. The 2012 winner was Mt. Pleasant area organic farm owner, Morgan Hoenig.