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ANNUAL ECONOMIC DEVELOPMENT AND TECHNOLOGY TRANSFER REPORT

Action Requested: Receive the report.

Executive Summary: Iowa's three public universities significantly impact economic development in Iowa on a daily basis in three primary ways:

- Offering research-based expertise and business assistance directly to Iowa's people, industry and communities in all 99 counties.
- Conducting academic research that results in intellectual property, discoveries and innovations available to business, industry and the marketplace. In FY 2015, Iowa companies generated \$12.32 million in revenue as a direct result of university discoveries.
- Educating Iowa's workforce. Today more than 80,000 students are pursuing academic excellence at the University of Iowa (SUI), Iowa State University (ISU) and the University of Northern Iowa (UNI).

In FY 2015, Iowa's public universities received \$1.02 billion in total sponsored funding. For FY 2015, the Iowa General Assembly provided \$8.8 million in total funding for ongoing and innovation activities at the regent universities. As a result, the universities increased new intellectual property disclosures by 11 percent from 261 disclosures in FY 2014 to 291 in FY 2015. In addition, a total of 3,603 individuals were employed by the 156 companies located at the SUI, ISU and UNI research parks and business incubators, an increase of 12 companies and 348 jobs over FY 2014.

Selected FY 2015 Economic Development and Technology Transfer Highlights

University of Iowa

The University of Iowa has tailored its economic development strategy and execution to further sharpen the university's alignment with the state's economic development priorities. Their new mission is: *To chart a path to economic prosperity for all Iowans by accelerating business and cultivating the state's workforce.* SUI's economic development enterprise is now organized around five major themes: Innovation, Entrepreneurship, Incubation, Engagement and Culture. Targeted ventures within the themes yielded important economic development impacts in FY 2015 including:

- Technology Transfer (Innovation) – Because of increased faculty outreach efforts, the University of Iowa Research Foundation (UIRF) received 149 invention disclosures in FY 2015 (up 7% over FY 2014). It also executed 40 license or option agreements, an increase of 25% over FY 2014. University of Iowa startups accounted for 11 of these agreements.
- Faculty Startups (Entrepreneurship) – UI Ventures' focus on startup creation, executive recruiting and raising capital is paying dividends. There are 43 startups in the pipeline, 18 of which were added this year. Moreover, startups are aggressively using university and state economic development resources to build value and advance through the commercialization pipeline. The following two examples are illustrative of this process.
 - IDx uses smart retinal imaging solutions to take photos of the back of the eye and automatically identify markers for diabetic retinopathy, glaucoma and cardiovascular diseases all in real time. In the past year, IDx has continued to grow, hiring three new full time employees, and seven interns from a diverse range of University of Iowa programs including Law, MBA, Engineering and Computer Science, and Health Informatics. In the past year IDx also raised an additional \$1,000,000, adding to the over \$10M in capital financing previously raised.

- Immortagen seeks to personalize cancer treatment through private tumor banking, full spectrum genetic profiling, revolutionary clinical decision support algorithms, and advanced mouse models for drug research and development. Over the past year, Immortagen received Proof of Commercial Relevance funds from the state, which led to an external market analysis to corroborate their current business model. They also brought on two experienced business people as advisors and used University of Iowa gap funds to increase the accuracy of their algorithm.
- Student Startups (Entrepreneurship) – Sixty student-run are under development through the John Pappajohn Entrepreneurial Center's (JPEC) student incubator program housed at the Bedell Entrepreneurship Learning Laboratory. Western Wise and Spectator are two examples.
 - Western Wise uses native English speakers to provide online English tutoring to Chinese K-12 students. The company emphasizes passion, patience and dedication to create a unique one-on-one experience between tutors and their students. Co-founders Emily Roberts, an Entrepreneurial Management and Spanish Major, and Chen Cui, a Ph.D. student in Computer and Electrical Engineering, were awarded \$1,000 at the Discovery and Innovation Awards Ceremony hosted by the Office of the Vice President for Research and Economic Development.
 - Spectator was co-founded by Jon Myers, a Mechanical Engineering major and Mitch Larson, an Enterprise Management major, and received a \$7,500 Hubert E. Storer Engineering Student Entrepreneurial Startup Award. Spectator is a sports information company that was created to connect fans with their favorite high school teams, strengthening athletic communities by bringing team statistics to a fan-accessible, centralized hub. Spectator was accepted into the Nebraska.
 - Startup Accelerator where team members spent the summer refining their business model.
- Venture School (Entrepreneurship) – The University of Iowa was awarded a National Science Foundation (NSF) I-CORPS Sites grant in FY 2015 to accelerate commercialization of discoveries by UI faculty, students and community-based entrepreneurs. As a result, 66 teams comprised of 182 entrepreneurs attended Venture School to assess and improve the commercial viability of their startup ideas and business models. Upon completion of the program, 27 new ventures were launched and 21 existing startups or businesses refined their business models. Eight Venture School cohorts were hosted in six locations: Iowa City, Des Moines, Cedar Falls, Council Bluffs, Cedar Rapids and the Quad Cities. The program will expand this fall to Sioux City and Dubuque.
- STEM Innovator Program (Entrepreneurship) – This professional development program for teachers infuses innovation and entrepreneurship into K-12 classrooms. During FY 2015, 88 educators from 32 Iowa school districts impacted an estimated 10,895 Iowa high school students.
- Research Park (Incubation) – There are now 18 companies, including six new startups located in the BioVentures Center (BVC) at the University of Iowa Research Park (UIRP). The number of companies housed in the BVC has tripled from when it opened in 2008 and the BVC is now close to full occupancy. Currently 42 companies reside at the UIRP and employ over 1,966 people. Key examples include:
 - Higher Learning Technologies (HLT), an educational application development company, has grown its sales to over \$3 million from more than 1,200,000 downloads of their apps. The company currently employs 50 people and plans to add more over the next twelve months. They have also received two equity investments totaling \$6.5 million. HLT received an award for best company culture in the Creative Corridor as well as multiple Prometheus and Silicon Prairie awards.

- SantosHuman, founded in 2008, is a University of Iowa spin-off company with an exclusive license to commercialize the Digital Human Modeling and Simulation (DHM&S) technology under development at the University of Iowa's Virtual Soldier Research (VSR) Program. SantosHuman's clients include the most recognizable brands in the world and they continue to build their portfolio of Fortune 500 industry clients and partners. New capabilities include predictive dynamic models and analysis specifically developed for dismounted warfighter activities, automated motion capture processing and analysis, predictive models for precision grasping, and a suite of capabilities which provide OEM's with truly human-centric design tools for occupant packaging. SantosHuman's products currently include a military-specific system for evaluating dismounted warfighter performance and interaction with warfighter equipment.
- Small Business Consulting (Engagement) – We continued our engagement with the Iowa small business community. Faculty/student teams completed 56 business consulting projects at 49 companies located in six Iowa counties (Delaware, Des Moines, Johnson, Linn, Polk and Scott).

Iowa State University

Economic development is a top priority for Iowa State University, and the university is very proud of the tremendous impact it has on the state economy. Iowa State recently reorganized its economic development enterprise with the establishment of the Office of Economic Development and Industry Relations (EDIR). Dr. Michael Crum, Vice President for Economic Development and Business Engagement, leads EDIR and reports directly to President Leath. EDIR consists of the following key university economic development units:

- Center for Industrial Research and Service (CIRAS): works with primarily, but not exclusively, manufacturing companies to enhance their performance in numerous ways, including process improvement, strategic planning, new product development, supply chain management and market expansion.
- Small Business Development Center (SBDC): ISU administers the state SBDC system which consists of 15 regional centers serving all 99 counties in Iowa. SBDC assists individuals interested in starting new companies and provides business services and counsel to existing companies across Iowa to solve management problems, improve operations, seek financing and pursue new opportunities.
- Pappajohn Center for Entrepreneurship: serves entrepreneurs, provides entrepreneurial opportunities for students and administers the university-wide academic program in entrepreneurship.
- ISU Research Foundation and Office of Intellectual Property and Technology Transfer: manage, market and license the intellectual property of ISU researchers and work with them to patent inventions and market the innovations to commercial partners.

The primary objectives of creating EDIR are (1) to increase the integration and collaboration among the university's economic development units to provide more comprehensive service to our clients and partners (i.e., a one-stop shop) and (2) to serve as the gateway or portal to the university's expertise, capabilities, resources and facilities that support and enhance economic development throughout the state.

Highlights from FY 2015 include:

- 1,548 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 \$386 million in total impact — \$329 million in sales gained or retained, \$45 million in new investments, and \$12 million in costs saved or avoided. Company executives stated that 5,154 jobs were added or retained as a result of the assistance they received from CIRAS and its partners.

Cumulatively, over the past five years, CIRAS and partners have reported impact from companies totaling over \$2 billion dollars (\$1.7 billion in sales gained or retained, \$220 million in new investments, \$80 million in costs saved or avoided) with 29,290 jobs added or retained as a result of the assistance received.

- The Iowa Small Business Development Center provided business assistance to individuals and companies in all 99 counties totaling 2,677 clients and 11,412 counseling hours. As a result of this counseling, 251 new businesses were started, 1,196 jobs were created and 447 jobs were retained. Additionally, SBDC assistance was credited by clients with increasing their capital infusion by more than \$52 million and increasing their sales by more than \$49 million. This translates into a new job every 7 hours, a new business every 35 hours and an increase of \$4 million in sales each month.
- The SBDC regional center, in partnership with the ISU Pappajohn Center for Entrepreneurship, provided 533 hours of counseling assistance to startup and existing companies; served 215 clients with one-on-one counseling; educated 361 attendees through workshops; provided advice to several hundred clients via telephone and e-mail; and advised a number of technology companies in the areas of licensing, equity-based financing, market entry, and numerous operational areas. The centers documented 24 new business with 76 new jobs created that have generated \$2,115,621 in capital infusion.
- The Regents Innovation Fund program at Iowa State has a competitive research component that pairs ISU faculty members with Iowa industries (primarily new to young startups) to create economic benefit for the companies. Surveys completed by companies on projects funded from June 2006 through June 2014 (surveyed one year after project completion) documented 152 jobs created or retained and an annual sales impact of nearly \$19 million due to the research projects conducted in partnership between ISU and the companies.
- ISU had a record setting year in FY 2015 with total sponsored funding of about \$425 million, including \$225 million for research. Businesses, corporations and commodity organizations accounted for approximately \$41 million of sponsored funding.
- The ISU Research Park has been hugely successful because companies find great value in having a closer physical presence to the university as it facilitates working with faculty and graduate students on research, tapping into and recruiting the graduate and undergraduate student talent pool, and accessing university facilities. Fourteen new companies and affiliates joined the Park in FY 2015, bringing the historical total to 246 companies and 4,594 employees for current and former tenants that are still in existence world-wide. Currently, there are 66 companies and research centers and 16 affiliates located in the Park, employing 1,572 and 213 people, respectively. In addition, four of the last five Iowa companies to go public started and reside in Ames, with three getting their start at the Research Park while two are still located at the Research Park.
- This past year the university formed a partnership with the City of Cedar Rapids and established a jointly funded Iowa State agricultural bio-based industries research and extension liaison position. The liaison has an office in Cedar Rapids, and works closely with the city's processing industries to identify opportunities for collaborating with Iowa State scientists, engineers, economic developers and extension specialists. The nature and scope of future collaborations are still emerging, but will likely include: research and development on more environmentally friendly processing technologies; adding value to processing waste streams through coproducts and byproducts; development of innovative products — such as biorenewable fuels and biobased products — from agricultural raw materials; exploring new directions for food ingredients that boost health and wellness; and facilitating training opportunities to enhance the skills and capabilities of Cedar Rapids industry employees.

University of Northern Iowa:

The University of Northern Iowa provided economic development assistance throughout all of Iowa during FY 2015. Focus remains on serving businesses, communities and organizations in all 99 counties. Specific areas of service offered by UNI include: entrepreneurship, community and economic development, market research, environmental research and service, sustainability, advanced manufacturing, metal casting and new lowans. UNI's economic development outreach programs are housed in the Business and Community Services (BCS) division. Since 2000, BCS has engaged the entire university community in its outreach efforts including faculty, staff, students and alumni – all of whom play a critical role in building a better Iowa.

In FY 2015, UNI's economic development efforts provided services in all 99 counties to more than 2,800 businesses, community and local government clients. Additionally, more than 34,000 individuals were engaged through UNI's efforts with IASourceLink. UNI further involved 207 faculty members and nearly 396 students in the delivery of these services and another 3,200 students were impacted by BCS programs. Finally, UNI leveraged each \$1 invested by the state with \$5 in private grants, fees or federal funding.

Highlights from FY 2015 include:

- In the area of entrepreneurship, business incubation and technology transfer, UNI provided job growth assistance to 84 second-stage Iowa companies through Advance Iowa, the state's certified Economic Gardening program. Entrepreneur participation of IASourceLink online resources, a joint program of UNI and Iowa Economic Development Authority, increased to more than 34,000. Also in FY 2015, 67 innovators have graduated from the Innovation Incubator and 4th Street Incubator. The Business Concierge team provided on-demand business and market information to more than 1,265 businesses. A total of 19 student businesses were tenants in the John Pappajohn Entrepreneurial Center's R.J. McElroy Student Business Incubator, and 54 additional student entrepreneurs were assisted by the affiliate program.
- In regards to waste reduction, environmental assistance, and the bioeconomy, UNI's Buy Fresh, Buy Local project saw participating restaurants and institutional buyers spend \$2.5 million on locally grown foods in 2015. Green Iowa AmeriCorps weatherized 490 homes and conducted 981 energy audits, saving nearly \$1.8 million in utility costs. The Tallgrass Prairie Center distributed native prairie seeds to 50 Iowa counties as part of its roadside vegetation project. In addition, UNI provided environmental technical assistance and on-site reviews to 459 businesses throughout the state.

The Institute for Decision Making (IDM) and the Regional Business Center (RBC) continue to be designated as a federal Economic Development Administration (EDA) University Center and expanded the 5-year regional entrepreneurship to a third region in Northwest Iowa. IDM conducted workforce development planning in eastern and western Iowa in partnership with two community colleges. Community clients report creating approximately 1,500 jobs as a result of local economic development technical assistance from IDM.

- In the advanced manufacturing and market research component of UNI's economic development enterprise, the Metal Casting Center (MCC) provided custom 3D sand-cast mold printing services to 80 foundries and supply chain companies. The MCC worked with an additional 26 Iowa company R&D projects and provided outreach to an additional 30 foundries. Market research and competitive intelligence was provided to 19 Iowa companies by Strategic Marketing Services (SMS).

State Funding for Economic Development and Technology Transfer

State funding in FY 2015 was provided in two primary economic development program areas:

1. Ongoing Economic Development and Technology Transfer Programs: FY 2015 \$5.8 million

In FY 2015, the state provided \$5.8 million for economic development programs including the research parks at SUI and ISU, the Center for Industrial Research and Service (ISU), Small Business Development Centers (ISU), Institute for Decision Making (UNI), Metal Casting Center (UNI), and the business entrepreneurship program at SUI.

2. Regents Innovation Funds (RIF): FY 2015 \$3.0 million

For the last decade, the General Assembly has annually appropriated to the public universities specific funding to support technology transfer, commercialization, entrepreneurship and business growth. The universities invest the funds received from the legislature in opportunities that yield successful startups, innovative business assistance, and critical research leading to commercialization. In FY 2015, the public universities received \$3 million. The universities are required to match the funding on a one-to-one basis from non-state resources. Research grants, private investors or companies interested in a project, and other university funds are often used as match dollars.

Examples of projects include:

- University of Iowa: Higher Learning Technologies (HLT) was founded by several University of Iowa students. HLT creates customized mobile test prep applications to assist students in preparing for technical, entrance and proficiency exams. The company has grown sales to over \$3 million from more than 1,200,000 downloads of their apps. They currently employ 50 people and plan to add more over the next year. They have also received two equity investments totaling \$6.5 million. HLT has been awarded best company culture in the Creative Corridor in addition to multiple Prometheus and Silicon Prairie Awards.
- Iowa State University: Faculty member Steve Carlson is conducting an investigation titled the Development of a Genetic Test for Salmonella Resistance in Cattle. The goal of the project is to identify a genotype that confers Salmonella resistance to black cattle. Previous studies identified the genotype in non-black cattle, which comprise only 20% of the cattle in the U.S. The aim of this project is to expand the scope of this genotype, and thus the marketplace for a genetic test, to the majority of U.S. cattle.
- University of Northern Iowa: UNI will continue to enhance its successful business incubation programs to support community entrepreneurs, faculty spin-offs and student entrepreneurs. The incubator and support facilities offer a physical link between the Iowa business community, campus innovators and faculty researchers to support business growth. Strategies for intellectual property commercialization include licensing, strategic partnerships and new business development. The Innovation Incubator has created a hub facility, coalescing the existing strength of Intellectual Property disclosures, mobile applications and university research with quality business services to support business incubation and growth. Additive manufacturing will be a major initiative this year to support the metal casting and foundry industry and advanced manufacturing with 3D printing technologies.

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 Economic Development Authority as required by law.

Indicators	FY 2013					FY 2014					FY 2015				
	ISU	SUI	UNI	Total		ISU	SUI	UNI	Total		ISU	SUI	UNI	Total	
1 Number of disclosures of intellectual property	98	98	10	206		113	139	9	261		130	149	11	290	
2 Number of patent applications filed	39	142	4	185		39	184	3	226		36	148	3	187	
3 Number of patents awarded	24	74	2	100		33	80	2	115		31	50	3	84	
Number of license and option agreements executed on institutional intellectual property in total	79	29	2	110		59	32	2	93		108	40	2	150	
Number of license and option agreements executed on institutional intellectual property in Iowa	39	8	2	49		19	12	2	33		61	13	2	76	
Number of license and option agreements yielding income	173	92	9	274		176	140	7	323		157	135	8	300	
Revenue to Iowa companies as a result of licensed technology ¹	\$45 million	\$2.38 million	\$2.2 million	\$49.58 million		\$21 million	\$1.87 million	\$1.85 million	\$24.72 million		\$8 million	\$1.62 million	\$2.7 million	\$12.32 million	
Number of startup companies formed, in total (through licensing activities)	2	8	--	10		3	12	--	15		4	15	--	19	
Number of startup companies formed, in Iowa (through licensing activities)	1	8	--	9		3	12	--	15		4	11	--	15	
Number of startup companies formed through UNI Incubator	--	--	78	78		--	--	71	71		--	--	94	94	
Number of companies in research park/incubators	53	47	28	128		66	49	29	144		70	55	31	156	
1 Aggregate sales reported by Iowa companies of products and services based on licensed inventions.															

Indicators	FY 2013					FY 2014					FY 2015				
	ISU	SUI	UNI	Total		ISU	SUI	UNI	Total		ISU	SUI	UNI	Total	
12 Number of new companies in research parks and incubators	3	4	18	25		11	7	16	34		11	6	11	28	
13 Number of employees in companies in research parks and incubators	1,240	1,707	64	3,011		1,370	1,824	61	3,255		1,580	1,966	57	3,603	
14 Royalties and license fee income	\$9.1 million	\$1.4 million	\$75,839	\$10.58 million		\$4.8 million	\$1.87 million	\$40,506	\$6.7 million		\$3 million	\$1.87	\$12,776	\$4.9 million	
15 Total sponsored funding	\$326.4 million	\$424.1 million	\$41.2 million	\$791.7 million		\$368.4 million	\$515.8 million	\$40.8 million	\$925 million		\$424.9 million	\$565 million	\$38.9 million	\$1028.8 million	
16 Corporate-sponsored funding for research and economic development in total ²	\$28.1 million	\$62 million	\$1.15 million	\$91.25 million		\$27.8 million	\$71 million	\$1.2 million	\$100 million		\$39.6 million	\$91.7 million	\$575,000	\$131.8 million	
17 Corporate-sponsored funding for research and economic development in Iowa ²	\$13 million	\$1.5 million	\$1.15 million	\$15.65 million		\$13 million	\$2.7 million	\$1.2 million	\$16.9 million		\$16.5 million	\$2 million	\$575,000	\$19 million	
2 Excludes corporate philanthropy.															