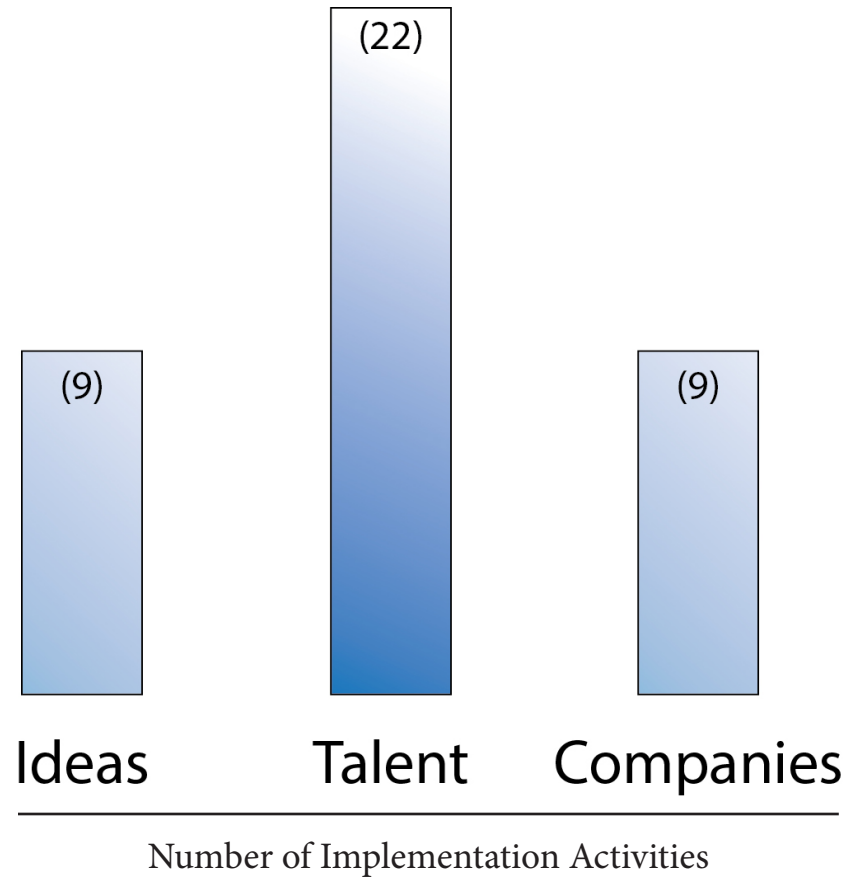


Implementation Activity

June - December 2013



2020 Vision: The South Dakota Science and Innovation Strategy

2020 Vision Management – Strategy Areas

<u>Initiative</u>	<u>Action</u>	<u>Responsibility</u>	<u>Outcome</u>
Strategic Area: Ideas			
Strategic Investments in Research Areas & Assets Aligned with Target Industry Sectors	Creation of Research & Development Grants (Innovation & Collaboration) for university research that aligns with the seven R&D activities. Funded through a \$1 million investment in base funds from the legislature during the 2013 session.	Board of Regents & South Dakota Legislature	Innovation & Collaboration grant program approved by the BOR in August 2012 . Institutional Proposals for Research & Development grants submitted on October 25 th , and under review by representatives of the SD REACH committee. First awards to be allocated in December 2013.
Development of STEM education facilities to support training of teachers in STEM disciplines and engagement of K-12 students in STEM topics.	Renovate the Jonas Science Hall at Black Hills State University (BHSU) to support the training of teachers in STEM disciplines. Design is underway. Construction planned for mid-2014.	BHSU and South Dakota Science and Technology Authority (SDSTA)	<ul style="list-style-type: none"> - Unique facility to prepare K-12 educators. - Increased teacher readiness and proficiency in teaching STEM.
Development of STEM education facilities to support training of teachers in STEM disciplines and engagement of K-12 students in STEM topics.	Construct a new Sanford Lab Homestake Visitor Center in Lead, SD to feature the science of the Sanford Lab to engage all age levels in STEM topics. Design is underway. Construction planned for mid-2014.	Lead Area Chamber of Commerce / Homestake Visitor Center, South Dakota Science and Technology Authority (SDSTA), and Black Hills State University	<ul style="list-style-type: none"> - Facility to engage general public including K-12 students in STEM topics. - Generate excitement for STEM in general public including K-12.
Development of a BHSU multidisciplinary science facility	Supported Black Hills State University (BHSU) proposal	BHSU and SDSTA	<ul style="list-style-type: none"> - Expansion of science facility capacity deep underground to

deep underground at the Sanford Lab.	submission to SD Board of Regents (SDBoR) for a new cleanroom facility to be hosted by on the 4850L of the Sanford Lab. South Dakota Science and Technology Authority (SDSTA) committed \$500K to prepare underground space to host the cleanroom. If BOR proposal is successful, the cleanroom funding would begin in January 2014 and continue over a 3 year period.		support multidisciplinary research for SD universities. - Leads to improved opportunities for undergraduate STEM research.
Children's Health	National recruitment of leading researchers in the area of developmental biology and genetics of childrens disease.	Sanford Health	Receipt of a number of extramural grants including several from NIH
Type 1 Diabetes	Establishment of a local and national clinical trials infrastructure	Sanford Health	Completion of a phase II clinical trial in type 1 diabetes. Planning of future trials.
Rare Diseases/Genetics	Establishment of a web-interface for registry of patients with rare diseases	Sanford Health	Organizations that represent patient groups at the national level are participants in this registry.
Breast Cancer	-Participant and developer of a national risk assessment tool for breast cancer. -Establishment of the only CLIA certified lab (mandated by FDA for application of actionable treatment for	Sanford Health	-Roll out of risk assessment tool January 2014. Incorporation of genetic component to this tool under development. -Quicker diagnostics and application of genomic information for patients. Adds a

	patients) in the Dakota's that can use genomic information for disease diagnosis. -Development of clinical trials infrastructure that using genomics in conjunction with CLIA validation for therapeutics.		research component to understanding breast cancer. -Additional clinical trials now in planning.
Native American Health	Investment in Center for Outcomes and Health Prevention Research Center	Sanford Health	Recipient of large NIH grant that supports research into native American health
Strategic Area: Talent			
Entrepreneurs in Residence	Development of an Entrepreneur in Residence program within the Regental system. Pool of competitive funds available at system level for Entrepreneurs	Board of Regents	Request for \$500,000 included in the informal budget request to the Board of Regents in August 2013 . Accepted by the BOR and advanced to the Governor as a part of the formal budget process. Awaiting potential inclusion in Governor's proposed budget.
On-Campus Policies, Training & Systems to Facilitate Entrepreneurship, Commercialization, & Intellectual Property Development	Coordination of a system commercialization summit to provide professional development to researchers/staff in the Regental system.	Board of Regents	Proposed by system Research Affairs Council in August 2013 and currently discussing desired topic areas for summit with a target for hosting in May 2013.
	Host NIH SBIR/STTR National Conference in Sioux Falls.	University of South Dakota Research Park	Conference held on October 28-30 in Sioux Falls with 370 registered presenters including participants from 38 states.
Stronger Links Among All	Collaboration with the	Board of Regents & Department of	Pilot program during the Spring

Postsecondary Institutions to Ease Transition for STEM Interested Students.	SDDOE and BOR to delivery remedial coursework through the South Dakota Virtual High School.	Education	2013 semester, with BOR & SDDOE Joint Powers Agreement approved in <u>October 2013</u> . Students currently enrolled in the program.
	Coordinated effort between Regental faculty and K-12 teachers to develop remedial coursework that is delivered in school districts during the senior year.	Board of Regents & Department of Education	Planning group met in May and July of 2013 to create blueprint for these courses. Interested school districts to offer courses online for the 2014-15 academic year.
	Facilitate regional meetings with K-12 teachers and Regental faculty to promote college-readiness courses. Collaboration between agencies to define “College & Career Ready” to establish common understanding for what students need to know in order to be prepared for postsecondary education.	Board of Regents & Department of Education	First set of meetings held on campuses in October 2013.
Incentives to Encourage Students to Pursue STEM Degrees and Rewards to Institutions for Producing Graduates in High Need Areas	Proposed the creation of the Governors Scholars program to provide undergraduate students with opportunities to collaborate with research faculty on projects during their first two years of enrollment.	Board of Regents	Request for \$600,000 included in the informal budget request to the Board of Regents during the <u>August 2013</u> meeting. No formal action taken to advance forward as a feature in the BOR request to the Governor.
	BHSU partnership with SURF to convert the Jonas Science building on the BHSU campus into a facility to	Board of Regents & SD Science & Technology Authority	Facility Program Plan approved by the BOR in <u>April 2012</u> , with formal announcement of partnership in <u>August 2013</u> .

	complement Sanford Lab's education efforts in Lead.		
Position and Expand Masters Degree Programs to Produce Talent for the Target Industry Sectors	Intent to plan currently being developed for a Joint Master of Science degree program in Analytics and Data Science through SDSU & DSU.	Board of Regents	The system Academic Affairs Council will consider the intent to plan during their <u>November 2013</u> meeting. If approved, the Board of Regents will consider the intent to plan during their December 2013 meeting. If approved the programs will move forward with external reviews.
Develop new Ph.D. programs and Enhance Activity in Existing Ph.D. Programs.	During the past year the Board of Regents have approved intents to plan for five new STEM based Doctoral programs including: <u>Agricultural, Biosystems & Mechanical Engineering (SDSU), Biochemistry (SDSU), Civil Engineering (SDSU), Civil & Environmental Engineering (SDSM&T), and a DSc in Cyber Security (DSU).</u>	Board of Regents in conjunction with Regental institutions.	The Board of Regents approved the new Ph.D. program in Biochemistry (SDSU) during their <u>October 2013</u> meeting. The remaining doctoral programs are currently engaged in external reviews and will advance final program approval requests if viable in the coming year.
Create two additional STEM summer internships at the Sanford Lab using South Dakota Science and Technology Authority (SDSTA) and private funding sources in 2014.	Create two engineering internships for the summer 2014 and beyond.	SDSTA	Additional opportunities for STEM real world experiences for SD university students.
Elementary Science Academies	Integrating Science, Engineering, Math, and Literacy into instruction planning for K-5 teachers. This work is used to build	Sam Shaw – Department of Education	At the end of this training, K-5 teachers will realize the vision for science education and understand the shift in instruction to have students perform science and

	instructional capacity in our existing teacher population.		engineering.
Middle and High School Science Academies	A training heavily founded in the science and engineering practices. This work is used to build instructional capacity in our existing teacher population.	Sam Shaw – Department of Education	At the end of this training, 6-12 teachers will realize the vision for science education and understand the shift in instruction to have students perform science and engineering.
Middle School STEM Programs	Implement Middle School STEM programs for Fall 2013	Ray Tracy, SD DOE STEM Career Content Specialist School District	Implemented programs <ul style="list-style-type: none"> • Brookings Middle School • Burke Middle School
High School STEM Programs	Implement High School STEM programs for Fall 2013	Ray Tracy, SD DOE STEM Career Content Specialist School District	Implemented programs <ul style="list-style-type: none"> • Sisseton • Harding County • Mitchell • Rapid City • North East Technical HS (Watertown)-Additional courses in Civil Engineering and Digital Electronics
Middle School STEM Camps	Implement Middle School STEM Camps for Summer 2013	Ray Tracy, SD DOE STEM Career Content Specialist School District	8 Camps (180 Students) <ul style="list-style-type: none"> • Sioux Falls (5 Camps) • Canton (1 Camp) • Brookings (2 Camps) • Todd County (1 Camp)
STEM Teacher Professional Development	Implement STEM Teacher Professional Developments for Fall 2013	Ray Tracy, SD DOE STEM Career Content Specialist School District	Teacher trained for courses beginning Fall 2013 <ul style="list-style-type: none"> • 2 Middle School Teachers • 6 HS Engineering Teachers • 5 Biomedical Science Teachers

STEM Teacher Professional Development	Implement STEM Teacher Professional Development (STEM Wise Conference) for Spring 2014	Kristy Jackson, East Dakota Educational Cooperative	TBD
VEX Robotics Events	VEX Robotics Events are held in areas of the state to encourage competitive robotic events	Ray Tracy, SD DOE STEM Career Content Specialist Sioux Falls School District Local Event Coordinator	13/14 Events <ul style="list-style-type: none"> • November 2013- Harrisburg • February 2014- Mitchell • March 2014- Sioux Falls (State) • April 2014- World Competition (Anaheim, CA)
NSF Tribal Colleges and Universities Program (TCUP)	Partnership between OLC/SDSU/SDSMT Pre-Engineering Education Collaborative (OSSPEEC) and the native-led Thunder Valley Community Development Corp. (TVCDC)	All partners involved: OLC SDSU SDSMT Thunder Valley Community Development Corporation (TVDCD)	Planned community of final 800-person net-zero regenerative community on the Pine Ridge Indian reservation to be incorporated into the Capstone Design course at SDSMT & will be completed in stages
NSF TCUP, NSF PEEC, NSF EPSCOR RII T1, USDA NIFA Tribal Research program, NSF RIG, NIH BRIN, NSF EPSCoR Biofuels, NASA EPSCoR Wireless	Adopted a constructivist pedagogy in Math, Science, and Technology (MST) Department for BS degrees in Natural Science and an AA degrees in Life Sciences and Pre-engineering	OLC Math, Science, and Technology Department	Retention rate has risen from 20% to 60%; quadrupled its number of annual graduate (2 to 8), and placed 96% of its students in jobs on the reservation or in grad school
NSF TCUPS Phase III	Using LIDAR to monitor Missouri River bank erosion	Two OLC research students	The LiDAR data assists the tribe in evaluating the effectiveness of the current mitigation measures used to control erosion and helps the USGS demonstrate other strategies to delay or stop the erosion in the future.

NSF TCUPS/PEEC	Collaborative Project-based service learning/research to determine if culvert under the road to the planned community will sustain a 100-year Flood	Two OLC research students	Research is in process.
Graduate Student development in partnership with USD and SDSU	-Development of “Cancer” and “Translational Research” tracks in the BBS PhD program at USD. -Participant in PhD in Biochemistry with SDSU	Sanford Health, USD, SDSU	Greater training opportunities at the graduate level
SPUR (and NSF-REU) undergraduate research program	-Developed 10-week undergraduate research experience in Biomedical Science in partnership with Augustana College	Sanford Health, Augustana College	-Obtained an NSF REU grant for training undergraduates in cellular and molecular biology. This one of only about 30 programs in the USA. -Increases talent pool for graduate programs.
PROMISE program	-lab experiences for middle and high schoolers. -10 week research scholarships for high schoolers -one day career fairs in science for high schoolers -STEM partnerships	Sanford Health	-Development of a greater pool of future undergraduate and graduate students. -greater awareness in the community of research and why it is important.
Strategic Area: Companies			
Proof of Concept Program	Program initiated 1-2013	GOED with BOR-RAC guidance	5 projects funded 2 successful— 3 in progress 3 pending applications

SD Equity Fund	May 2013 exploration began	Governor-GOED-SD Development Corporation	October Consultant report received
Technology Business Accelerator	Program enhanced	GOED-SD Technology Business Center	\$92,500 in SBA Funds secured to support enhancement of 6 month business accelerator program.
Manufacturing Technology Solutions	Jan 2013	MTS-SD MEP program	Strategic Plan developed Initiation of CEO support group Innovation Internship initiative
Governor Research Centers	June 2013	GOED	Two advanced manufacturing applied research centers, metal and plastics, were funded and each center has significant private sector collaboration
Grow South Dakota Program	July 2013	GOED-Education-DOT	Program supports efforts by community and regional economic development organizations to develop an environment to support business start-up, expansion and growth.
Sanford Applied Biosciences	<ul style="list-style-type: none"> -continued development of transchromosomal bovine for production of human antibodies -development of commercial opportunities for therapeutic and reagent development with federal government, universities and pharmaceutical companies. -intellectual property development. -applied research and development 	Sanford Health	<ul style="list-style-type: none"> -major collaborations with Naval Medical Research, US Army Research, Harvard Medical School, Bristol Meyers Squibb, Kyowa Hakko Kirin -development of human antibody therapeutic candidates for infectious disease, cancer, autoimmunity and inflammation -direct development of antibodies for influenza (pandemic and seasonal), dengue, filoviruses, alphaviruses, Hantavirus MERS CoV, human cancer antigens and others

			-funding from business contracts as well as Department of Defense
Exemplar Genetics. We are academic collaborator			-Phase I SBIR grant progressed to phase II -Another Phase I SBIR being prepared for progression to Phase II
Eutubics. We are academic collaborator			Phase I SBIR received

Submission by:	Color Code
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Pat Lebrun - SDSTA	Rust
Ray Tracy – Dept. of Ed.	Green
Hannan LaGarry – OLC	Purple
Mel Ustad - GOED	Red
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