

Pressing the Advantage

A Regional Growth Strategy for the I-29 Corridor

June 2010

—Executive Summary—



Regional Technology Strategies, Inc.
205 Lloyd Street, Suite 210
Carrboro, North Carolina 27510
919-933-6699
www.rtsinc.org

Page left intentionally blank

The communities that span the I-29 Corridor in eastern South Dakota from North Sioux City to Watertown and west to Yankton and Madison have joined forces, through a newly created I-29 Corridor Task Force, to craft a plan to identify and act on collaborative opportunities to grow their whole region and to build the capacity to sustain this growth¹

This report, prepared by Regional Technology Strategies (RTS) of Carrboro, North Carolina under contract to the I-29 Corridor Task Force offers a strategic plan that fuses three overlapping economic development dimensions.

1. The plan seeks to parley existing and emerging private sector strengths into more jobs, more income and more wealth in I-29 Corridor communities.
2. The plan advances a strategy to build and support the research enterprise and educational assets within the region's university and post secondary education and training communities and link them to the private sector as economic development drivers.
3. The plan recommends initiatives and actions to retain and attract higher education and post-secondary graduates and their knowledge and skills as the foundation for the region's future growth and prosperity.

The purpose is to produce more high quality jobs throughout the region, more wealth in the I-29 Corridor communities, and more economic opportunity for all of the region's citizens. The most direct route to these goals are to build and exercise the capacity to engage in higher value (and higher wage and earnings) commerce.

The initial section of the report is the Phase 1 analysis of the I-29 Corridor economy at the regional and sub-regional levels and, based on this analysis a strategic plan, to build and use emerging and existing private sector strengths to generate more higher paying jobs and more wealth in the region's communities. The next section offers the Phase 2 analysis and plan for region's public universities and non-profit research organizations role as a major economic development resource for the overall Phase 1 plan as well as their continued advancement as a economic development driver on their on accord. Finally, a recommendation is offered on a collective regional approach to economic development in the I-29 Corridor.

Phase 1: Economic Analysis of the I-29 Corridor

The economic analysis phase of the report looked at the I-29 corridor through a series of lenses: relationship of the corridor to the rest of South Dakota, demographic changes, leading economic clusters, including those with export potential, workforce development capacity, and the region's capacity in innovation and entrepreneurship. One issue that is critical to understand that although there is value in thinking of these counties as one

¹ For the purposes of this study, the following counties are included in the I-29 corridor: Brookings, Lincoln, Clark, Marshall, Clay, McCook, Codington, Miner, Day, Minnehaha, Deuel, Moody, Grant, Roberts, Hamlin, Turner, Kingsbury, Union, Lake, and Yankton.

region, there are, in economic terms, sub-regions within the geography defined by such elements as geography, workforce, sectors, infrastructure, natural resources and political boundaries. Whenever possible analysis was performed taking these sub-regions into account.

Phase 1: Key Findings

Region/State

- The I-29 Corridor, led by the Sioux Falls metro area, dominated economic and population growth in South Dakota over the last 10 years.
- The region's economy has grown faster than the state, 9% compared to 6%.
- The Corridor's economy varies substantially from the rest of the state with more finance, services and manufacturing and less agribusiness, government and tourism.

I-29 Demographics

- The region has experienced net in-migration.
- The Corridor is becoming more integrated as more workers commute to work within the region.
- The region's workforce has a large cohort of retiring workers that presents a workforce challenge.

I-29 Lead Clusters

A key component of RTS' analysis of the I-29 Corridor is looking at the region's clusters as an economic unit. A cluster is a geographic concentration of interrelated competitive firms and institutions of sufficient scale to generate external economies making the whole greater than the sum of its parts. They occur where a group of businesses, drawing on similar resources, exist in relationships with other nearby businesses and institutions that contribute to their competitiveness. Examples range from the high tech clusters of microelectronics, semiconductor, and software businesses in Silicon Valley, California to the biotechnology industry in the Research Triangle, North Carolina or the ceramics industry in western New York. A region's clusters tend to be the primary wealth generators in its economy.

In terms of the I-29 Corridor, some key findings are:

- The major clusters in the region all grew from 2004-2009 with the exception of agribusiness.
- Both the financial and the energy clusters are forecast to grow significantly from 2009-2014 but they are affected by recent legislative changes at the Federal level.

- The clusters with the greatest potential to export their products are: financial services, life sciences, agribusiness, energy, and advanced manufacturing.
- Most of the growing clusters in the region contain significant levels of manufacturing employment.

Workforce Development

- The Corridor's demographics show both good and bad signs for the region with the in-migration offset by out-migration of young people and a large increase in retirees.
- Due to these demographic shifts, the region has experienced workforce shortages.
- The lack of locally available workforce training resources is alarming. Two technical institutes are not sufficient given the geography, economy and population.

Economic Targets

- The targets established by the state and within the Future Sioux Falls effort provide an excellent starting point for looking at targets within the Corridor, in particular the state targets for biotechnology, medical devices, energy and computer/IT along with the Future Sioux Falls targets of medical services and research, corporate and data services and renewable energy technology provide a strong basic array of targets.
- The super-sector of advanced manufacturing is a key and serves many of the other targets.
- There a number of emerging sectors that relate well to the overall economy and some of the targets identified above.

Innovation in the Economy

- The hard infrastructure for innovation, such as incubators, research parks and fiber optic backbone is well developed.
- The soft infrastructure of technical service providers is adequate but could be improved.
- There are no significant resources available for early stage capital.
- The level of R&D performed in South Dakota industry is very low, even when adjusted to the size of the economy.
- Risk capital sources are substantial relative to the size of the economy.

Phase 1: Recommendations and Action Steps

The recommendations and actions presented below define a regional economic development strategy based on the current and emerging wealth generating sectors and

clusters within the I-29 Corridor. As such it focuses on producing and deploying the economic strengths that will govern the region's future economy by (1) improving the economic competitiveness of the lead and emerging economic engines of the Corridor and (2) integrating the economic development assets more fully with the university-based development strategies developed in the Phase 2. The goal remains a constant: generating greater numbers of higher wage jobs and building wealth in the region's communities.

Workforce Development

Recommendation: Develop more widely distributed workforce training that meets the needs of new workers, existing workers and companies.

Actions

- The region and specific interested communities should work with Lake Tech and Southeast Tech to add satellite campuses where needed and funded.
- Where a satellite campus is infeasible, investigate the model used by Yankton at its Regional Technical Education Center.
- Advisory councils should be employed to get companies across the region involved and committed.

Recommendation: Encourage high schools students to take STEM related courses even if they are not planning on matriculating to a four-year university.

Actions

- Continue/expand the development of articulation agreements between the K-12 system and tech schools.
- Continue/expand the development of articulation agreements between the tech schools and state universities.

Recommendation: Help technical school students understand the occupational opportunities within the regional economy.

Action

- Include technical school students within the Dakota Seeds program.

Private Sector-Led Networks

Recommendation: The I-29 Task Force should facilitate the creation of region-wide business associations.

Actions

- The Task Force should begin by convening an Advanced Manufacturing Association within the Corridor.
- The Task Force should examine opportunities for other sectoral-based associations.

Recommendation: Sub-regional economic development professionals should facilitate the development of workforce skill networks.

Action

- Use corporate roundtables to build and serve sub-regional skill councils.

Entrepreneurship

Recommendation: The I-29 Task Force should work within the region to build a better entrepreneurial environment.

Actions

- Develop under-35 entrepreneurship networks that encourage and excite emerging talent.
- The I-29 Task Force should investigate the development of a region-wide entrepreneurship council.
- Investigate avenues to create local or sub-regional organizations to own entrepreneurship.
- Encourage the addition of an effective entrepreneurship program within the technical schools.

Recommendation: Address the earliest stage funding gaps through proof-of-concept and pre-seed funds for the region's universities and technology companies.

Action

- The I-29 Corridor Region Task Force should form a sub-committee to plan and lead an initiative to address the earliest stage risk capital gaps. It is suggested that the sub-committee be comprised of technology company entrepreneurs and representatives from the risk capital community, technical assistance professionals from technology-based economic development intermediaries (incubators, et al), university and non-profit technology transfer offices. (Also see Proof of Concept fund recommendation under University – Community Linkages.)

Creative Economy

There are opportunities within I-29 corridor to use creativity as an economic development engine.

Recommendation: The I-29 Task Force should investigate and encourage initiatives within the region based on the creative economy.

Actions

- Encourage sub-regional efforts that build on cultural and nature resource assets.
- Encourage the development of local food systems as cultural assets.

Phase 2: The University and Research Sector

The second phase of the report addresses the role of the area's universities and non-profit research organizations within the I-29 Corridor Region's new economic growth strategy to generate more higher-paying jobs and wealth in communities. In particular we focused on South Dakota State University, the University of South Dakota, Dakota State University, Avera Research Institute and Sanford Health.

Phase 2: Key Findings

The following key findings from this university and linked non-profit research institution analysis summarize the basis for the recommended actions that conclude the Phase 2 section of this report.

- South Dakota's colleges and universities (particularly in the I-29 corridor) turn out significant numbers of science and technology-oriented degrees at the baccalaureate level and compare favorably to other states. However, this is not the case at the graduate level where science and engineering degree production lags behind other states.
- The South Dakota economy, compared to other states, employs relatively fewer degreed individuals, at every level and particularly in the sciences and engineering. In addition, South Dakota, compared to other states, seems to export relatively more of its talented young people.
- Private sector R&D support is one of the strongest indicators of innovation capacity. There is a low level of private research support within the region's universities.
- The lack of emphasis on research and graduate programs within the state's universities during the 80's and 90's has constrained the region's capacity to produce and support knowledge-intensive, higher value commerce jobs and companies.
- The universities have lost much ground to their peers in a very competitive environment. They will need to be very strategic about support for graduate

education and research if these activities are to be funded at a level that will allow them to get back in the game.

- While there is growing across-the-board excellence in R&D, the most nationally competitive area of knowledge development lies in the life sciences – widely defined. This includes the historical and proven strength in plant and animal bioscience as well as emerging strengths in biomedical and medical engineering. The broad technology platform associated with light activated materials and whose applications cut across campuses, research institutes, companies and targeted within a 2010 Center should be noted. Electrical engineering should also be acknowledged as a strength area.
- The three universities have distinctly different missions, profiles and economic development engagement strengths that can lead to very different roles in regional development.
- There is a good bit of effective outreach activity to employers activities associated with SDSU College of Engineering and Dakota State information technology and computer information systems but it is not scalable or routinely structured to systematically respond to the needs of the region’s manufacturing community – especially the very strong advanced manufacturing presence in the Sioux Falls, Brookings, Watertown and Yankton communities.
- The presence of the national industrial extension system, the MEP, is very limited in South Dakota and the I-29 region when compared to other states. In fact, it is the only state without a physical MEP center location.
- Relative to institutions in other states, South Dakota is playing a twenty-year game of catch-up, as most of their peer institutions established technology transfer functions by the mid 1990s. Because of both startup and catch-up demands, the level of staffing across the state of technology transfer functions and offices is limited and stressed given the task at hand.
- On many university campuses, entrepreneurship centers or programs provide ancillary services to the established technology transfer offices, however in South Dakota these programs are themselves in early stages of development and mostly confined to instructional activities and student-focused programs.
- The university cultures and related policies and practices for entrepreneurial behavior and economic development engagement are in early formation stages.
- The public and non-profit capacity to support university-associated science and technology-based economic development is well ahead of the universities’ research enterprises and entrepreneurial cultures capacity to generate opportunities. For the size of this regional market, the shared university-community innovation infrastructure is very advanced. The constellation of existing and planned research parks and campuses and incubators throughout region – all with existing and

potential university connections should as a group function as a formidable economic development asset.

Phase 2: Recommendations and Action Steps

The recommendations and actions presented below define a regional economic development strategy based on the current and emerging capacities within the higher education institutions and non-profit research organizations within the I-29 Corridor. Within the main report, in a number cases the recommendations and actions also include additional implementation notes. The strategy focuses on producing and deploying the talent and knowledge that will govern the region's future economy by (1) building capacity across all campuses to produce economic development outcomes and (2) fusing with the previously presented private sector economic development strategy to support and leverage that strategy's specific objectives and outcomes. The goal remains a constant: generating greater numbers of higher wage jobs and building wealth in the region's communities.

Institutional Roles

The three universities and two research institutions have distinctly different missions, profiles and economic development engagement strengths that suggest different roles in regional development strategy based on what they do best. Because of the limited resources that are available and the need for strategic focus it is recommended that each institution be viewed as the lead actor in the domains where it is in position to lead but not that activities and participation be limited to that domain. A role for the capacity associated with the Sioux Falls University Center (UC) and its GEAR Center facility should also be factored into this strategy. On behalf of all South Dakota's public university, the UC functions as an attendance center for non-traditional undergraduate students and for selected graduate degrees. The GEAR center offers lab space for lease for university researchers with grant funded projects that benefit from being in Sioux Falls rather than their main campuses as well as incubation space for emerging laboratory-based companies. The facilities together represent a substantive hard innovation infrastructure asset that can link to and leverage resources within the Sioux Falls region and accommodate collaborative research efforts that focus on commercializeable outcomes.

South Dakota State University

For the purposes of this plan, it is recommended that SDSU function in the lead position in forging and advancing the region's university-private sector nexus based on the existing scope and volume of its activities in this area. SDSU has a long and successful history in agricultural extension and agricultural biotechnology development (including private sector outreach and licensing), the state's college of engineering (which has strong private sector connections), and the region's only full time university technology office and director with experience in industry and academic administration. SDSU working with its Foundation should accelerate the recruitment of endowment funding for a comprehensive center for innovation and entrepreneurship that is aligned with the Entrepreneurial Studies academic program, is cross-cutting and leads both in-reach within the university and outreach in the region. SDSU should also house a newly created South Dakota MEP for the eastern half of

the state. The existing technology and know-how base associated with USD's activities – especially biomedical engineering in Sioux Falls and DSU's information systems and assurance technological prowess and connections into industry also need to be explicitly supported and advanced as part of this regional effort to build out the university-private sector linkage network.

Dakota State University

Capacity to create and deploy information technology and IT know-how is a ubiquitous and essential regional competitiveness asset. The good news here is that one of the distinguishing features of the I-29 corridor as an economic region is that it has a strong university with a singular dedicated IT mission. The bad news is that, to an extent, DSU's value as an economic development asset is one of the region's best-kept secrets. It is recommended that DSU function as the lead economic development-related resource in IT matters related to information systems, information assurance, and digital arts and design.

University of South Dakota

As the state's liberal arts university with a strong on-campus research profile in several science domains (neuroscience, behavioral sciences, et al) as well as an emerging but already strong position in several biomedical engineering areas within its smaller Sioux Falls campus, the basic research enterprise at USD needs continued and greater support. This plan contemplates leadership from USD in two specific areas. First, USD's Sanford School of Medicine is a critical asset in the region's bioscience future by virtue of its research portfolio and its connection to the Sanford Research's Sioux Falls campus. The constellation of medical/biomedical assets in Sioux Falls represented by the School of Medicine, the USD Graduate School's Biomedical Engineering Program, the Center for Research and Development of Light-activated Materials, Avera Research Institute, and the Sanford Health Research facilities offer a major development opportunity. Leadership is required from both the public and private sides of this development path. USD is the natural entity to lead on the public side.

Second, creative endeavors associated with arts and design not only add value to products and services, in a broader sense they define a community and a region's amenities and cultural identity. Their presence, or lack thereof, is part of the economic development fabric. Through its College of Fine Arts USD is the region's most important asset in this area and should be viewed as a leader and critical resource in developing and implementing strategies to build the region's arts, design and cultural amenity profile.

Avera Research Institute and Sanford Research

As private, non-profit research organizations, Avera Research Institute and Sanford Research are not educational institutions but tightly focused mission driven organizations. Their ability to participate in the development and implementation of this regional strategy should be viewed through that lens. Although there is a considerable difference in scale between the two organizations, both are enthusiastic participants and entrepreneurial with substantive, focused research agendas. They should be supported in their plans AND also

factored into regional endeavors and collaboration research initiatives where appropriate including innovation infrastructure networks.

Talent Development & Deployment

Recommendation: Launch and support an initiative to retain higher education graduates, especially those in science and engineering fields and recapture talented graduates that have left the state.

Actions

- Establish internship programs either modeled on the statewide Dakota Seeds program or functioning as adjuncts to the program.
- Work with respective alumni organizations to identify and “claw back” talented graduates that reside outside the region.

Knowledge Development

Recommendation: Lead a major effort to boost focused university research activities oriented toward producing economic development outcomes.

Actions

- Create a South Dakota Research Alliance (SDRA) - a statewide public – private partnership with an economic development mission - to accelerate the growth of the state’s economy by enhancing university research that can lead to commercializable outcomes, developing and attracting scientific talent with an entrepreneurial orientation, and encouraging technology commercialization.

Knowledge Deployment

Recommendation: Establish the South Dakota Industrial Extension Service.

Action

- The I-29 Corridor Task Force should create a Committee to lead an initiative to establish the South Dakota Industrial Extension Service.

Recommendation: Form a committee to explore ways to establish and market a creative economies initiative at the regional level.

Action

- Work with USD as the university lead but use the considerable assets of DSU and SDSU.

Technology Transfer

Recommendation: The economic development community should work with the region’s universities and non-profit research organizations when appropriate to bolster,

connect, focus and support their technology transfer efforts as it has a vested interest in their success.

Actions:

- Support the establishment of the South Dakota Research Alliance.
- Support efforts to make South Dakota companies, startups and jobs the top Technology Transfer Office priority for publicly funded universities as opposed to maximizing licensing revenues.
- Seek funding support outside the general university budget.
- Seek to enable the Technology Transfer Offices but don't centralize them.
- Connect technology transfer personnel to the local and regional economic development community's awareness of new and established technology and knowledge intensive firms.
- Support the formation of an I-29 Corridor Technology Transfer Alliance.
- The economic development professionals in the three university communities should support on-campus efforts to build a fully realized technology transfer and commercialization network that connects to the local and regional innovation infrastructure and to the private sector.

Entrepreneurial Culture

Recommendation: Actively encourage the creation of an Entrepreneurship Center at South Dakota State University.

University-Community Linkages

Recommendation: The economic development professionals in the four communities with university research operations should support efforts to build more comprehensive and robust entrepreneurship, commercialization, talent deployment and outreach activities on campus and help organize efforts on their innovation infrastructure side to connect to the on-campus networks.

Actions

- The economic development community should specifically support efforts to build strong university-connected entrepreneurship support systems.
- The economic development community should help the universities establish and expand on campus internship programs that place undergraduate and graduate students in the region's companies (including startups) and research institutions.

- The economic development community should form a formal regional innovation infrastructure network.
- Establish a Proof of Concept Fund to validate promising university-based technological opportunities and to bridge the gap between research grant funding and early stage private investment funding. A proposed plan for such a fund has been developed by South Dakota Innovation Partners and the South Dakota State University Technology Transfer Office.

The Region Works

There remains a powerful argument and strong need to organize and function at the regional level. The I-29 region is a corridor connected through common infrastructure and its communities are networked in employment and trading patterns, one way or another, to its Sioux Falls hub. The need for some joint action at the regional level has never been more acute. The region's companies, economic development organizations, and education and training service providers function in an intensely competitive environment in which even multinational corporations form networks to extend resources and reach. Broad partnerships are required among those parties with common interests to bring the region's full range of economic development assets in to play, to extend and leverage local resources and to create new regional competitive advantage.

Recommendation: A regional SD29 Alliance should be established to market the I-29 Corridor and support economic development initiatives that benefit the entire region.

Actions

- The natural starting point for this effort is for the I-29 Task Force to explore ways of transforming itself into this type of organization. The Task Force membership already includes the region's major economic development actors and could be expanded as warranted.
- At the outset, the Alliance should come together as a way of marketing the region, leveraging the assets of the economic development, business and academic communities. Opportunities will arise from this joint marketing that will, in time, strengthen the relationships between the various organizations and lead to new economic activity and growth.