

## *Chapter 5B: Economic Development Initiative*

### Starting Points

Universities contribute to economic development on a local, regional, national, and international scale through several mechanisms including:

- ✘ Contribution to the economy through direct expenditures,
- ✘ Development of an educated workforce,
- ✘ Production and transfer of technology to and from industry,
- ✘ Fulfillment of research and information needs of industry and communities through research projects, centers, and institutes, and
- ✘ Creation of companies through research projects and collaborations.

<b>Table 5B.1 Starting Points</b>		
	CSU	COE
Degrees conferred (2004/2005):		
✘ B.S.	4,281	291
✘ M.S., M.E.	1,045	129
✘ Ph.D.	187	33
Funded research (FY'05):	\$244.3M	\$50.4M
Faculty head count (FA'05):		
Invention disclosures:	48	8 <sup>3</sup>
U.S. patent applications filed:	32	9
U.S. patent applications issued:	2	5
Licenses/option agreements:	7	2
Licensing income:	\$1,250,000	\$11,000

The research enterprise in the College of Engineering is one of the strongest performers at Colorado State University. The annual research expenditures for the University totaled a record \$244.3 million in fiscal year 2005, \$20 million more than 2004. The College of Engineering research expenditures for FY2005 totaled over \$50 million, almost \$10 million more than 2004. To put this into perspective, the COE faculty headcount is less than 1/10 of the University total, but contributed almost half of CSU's funding increase. Because of the College of Engineering's extensive research program, there is an opportunity to build strong, productive two-way relationships with industry and extend the impact of our current programs through economic development.

The Economic Development Initiative ascribes to the philosophy of "driving the future through innovation and entrepreneurship." In effect, it is going "back to the future" in realizing the purpose of land grant institutions in the 21<sup>st</sup> century. Through partnerships with stakeholders, this initiative will build an economic competitive capacity where our strengths in research will be inextricably linked with market opportunities. An economic impact survey conducted by the National Association of State Universities and Land-Grant Colleges in 2000 found that for every \$1 allocated by the state legislature, Colorado State

<sup>1</sup> 2005/2006 CSU Fact Book.

<sup>2</sup> The College of Engineering Fact Book reports 93 faculty (including faculty on transitional retirement). The 2005/2006 CSU Fact Book reports 86 regular tenured and tenure-track faculty.

<sup>3</sup> COE technology transfer figures are for 2004.

generated \$9.59 of additional statewide economic activity. The study also found that the national average “return” on state investment was \$5 and fewer than 8% of the 111 state universities surveyed reported a return in excess of \$9.

Generally, growth of transportation and communication technologies, increased freedom of trade, and the flow of financial and human capital across regional, national, and international boundaries has created a dynamic, global economy. Colorado State University is one of 151 Doctoral/Research-Extensive institutions that create an environment for a sustainable economy important to the future of a region. When regional stakeholders of higher education, finance, community groups, and businesses come together to exchange resources, economic development is more likely to occur.

The innovation and productivity in a region tends to center around specific technologies and expertise of the human capital called regional economic development clusters, or simply, clusters.

Northern Colorado is one of the best places to be involved in a broad array of technology-based economic development efforts (Table 5B.2).<sup>4</sup> The Innovation-Entrepreneurship Nexus Study examined a decade of data from 394 regions of varying sizes across the country. Fort Collins finished No. 1 overall in the rankings of the most innovative and entrepreneurial regions in the United States. Parameters for the study included entrepreneurial activity among new and growing companies during an 11-year period; innovation based on the number of patents, research, and development dollars spent; and number of high-tech industries.

Colorado State University has recently developed an organizational structure including the new Office of Economic Development, as well as goals, and objectives that will better support economic development. The linking of the University with global challenges has resulted in the identification of the following “superclusters:”

- ✘ Information Systems and Technology (ISTeC),
- ✘ Infectious Diseases,
- ✘ Food, Health & Human Nutrition (21st Century Agriculture), and the
- ✘ Environment.

As a part of the Economic Development Initiative, the College of Engineering also recognizes the importance of linking the College’s resources and expertise to global challenges. Through input from a faculty advisory group, decadal study focus groups, and the College’s external industry advisory board, the following attributes for COE clusters were developed. COE clusters will:

- ✘ Support local and regional economic development with national and global impact,
- ✘ Tie cluster identities to external needs and opportunities, not to internal structure,
- ✘ Build on existing strengths of faculty and laboratories to their extend impact,
- ✘ Engage the private sector as a full partner,
- ✘ Incorporate a cluster name that is purposefully ambiguous to attract inquiry, discussion, and innovative application,

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<sup>4</sup> The Innovation-Entrepreneurship Nexus Study was commissioned by the federal Small Business Administration and the Edward Lowe Foundation, a Michigan-based entrepreneurial support organization.

- ✘ Foster research collaboration with faculty across campus,
- ✘ Exist as long as the cluster is purposeful, no longer, and
- ✘ Establish mechanisms for technology transfer out of and into laboratories.

**Table 5B.2 Most Innovative/Entrepreneurial Regions in the United States:  
Based on Average Relative Rankings on Innovation  
Capacity and Entrepreneurship Activity**

U.S. Region	Regional Size	Regional Innovation Capacity Index (Relative Rank)	Regional Entrepreneurship Index (Relative Rank)
1. Fort Collins, CO	Medium	98.7%	97.2%
2. Raleigh, NC	Large	99.7%	95.9%
3. Provo, UT	Medium	93.8%	99.4%
4. Austin, TX	Large	99.2%	92.6%
5. Boston, MA	Large	98.9%	92.8%
6. Denver, CO	Large	97.9%	93.6%
7. San Jose, CA	Large	100.0%	90.8%
8. Logan, UT	Small	91.8%	99.2%
9. Atlanta, GA	Large	93.3%	96.9%
10. Salt Lake City, UT	Large	92.1%	97.9%
11. San Francisco, CA	Large	99.4%	90.3%
12. Boise, ID	Medium	91.3%	97.4%
13. Minneapolis, MN	Large	96.9%	89.8%
14. Phoenix, AZ	Large	91.6%	95.1%
15. Portland, OR	Medium	92.6%	91.8%
16. Burlington, VT	Medium	95.9%	87.7%
17. Colorado Springs, CO	Medium	88.5%	95.4%
18. Glenwood Springs, CO	Small	83.9%	100.0%
19. Tucson, AZ	Large	93.1%	87.0%
20. Dallas, TX	Large	95.6%	83.2%

Source: 1990-2001 LEEM data file, U.S. Census Bureau

This chapter addresses University Strategic Plan goals # 9, 17, 18, 19, 21, 22, 23, 30, and 33. The College of Engineering’s objective with respect to economic development is to:

**Objective:**     **Develop and build an economic development program that results in stronger academic and research programs and benefits both the College of Engineering and our stakeholders through outreach and active engagement.**

**Goal:**            Increase externally funded research.

**Strategies:**

- ✘ Create an administrative structure within the College of Engineering that supports economic development initiatives,
- ✘ Build a schedule for communications that provides information about current research in the COE,

- ✘ Build on the strengths of existing faculty research to address and focus on national and global needs,
- ✘ Actively participate in economic development activities at the university, in the community, and throughout the region,
- ✘ Engage private sector business as a full partner in our endeavors, and
- ✘ Continue to work cooperatively with the Division for Research. This includes working effectively with Office of Sponsored Programs, Council of Research Associate Deans, and Colorado State University Research Foundation.

**Goal:** Build relationships and create tools to support engineering workforce development.

**Strategies:**

- ✘ Develop a plan with the Engineering Career Liaison to strengthen our employer outreach efforts, to place current students in jobs and recruit prospective students into our graduate programs,
- ✘ Create more experiential learning opportunities for our students leading to career placement through relationships with corporations and alumni,
- ✘ Develop a graduate career placement survey to be mailed 3-6 months after graduation, and
- ✘ Develop an effective relationship with the Office of Continuing Education.

**Goal:** Support technology transfer to both internal and external audiences, leading to increased activity.

**Strategies:**

- ✘ Define and develop transparent processes that enable interaction between internal and external constituents,
- ✘ Pursue the “co-dependent” model for economic development to enhance technology transfer, and
- ✘ Develop an effective relationship with the Division for Outreach and Strategic Partnerships. This includes working with Office of Economic Development, Continuing Education, Colorado Institute for Public Policy, Colorado Water Resources, Research Institute, and the Office of International Programs.

**Goal:** Build relationships with corporations and alumni that lead to gifts that support and equip current and future engineering facilities.

**Strategies:**

- ✘ Identify partners that will support construction of new facilities, as well as equipment gifts,
- ✘ Build a schedule for communications that provide information about current research in the COE,
- ✘ Develop additional communications and contacts targeted to high level prospects, and
- ✘ Develop effective relationships with CSU Development.

**Goal:** Create an effective and sustainable economic development program that promotes awareness of the COE.

**Strategies:**

- ✘ Provide needed human resources to support economic development activities,
- ✘ Clearly identify contact persons for each area of economic development, and
- ✘ Create easy-to-use tools that support effective communications, both internally and externally.

**Metrics:**

- ✘ Industry sponsored research,
- ✘ Total external funded research from contracts and grants (target: maintain an average of \$500K/tenured and tenure-track faculty-year),
- ✘ External funded research from industry and private sponsors (target: increase from 13% to 20% of annual COE research volume),
- ✘ Career placement rate,
- ✘ Invention disclosures and royalty income on inventions,
- ✘ Cash and equipment gifts, and
- ✘ Economic development website hits and click-throughs.