

Growing Jobs, Industries, and Talent:

A Competitive Advantage Assessment and Strategy for the State of Nebraska



Battelle Technology Partnership Practice
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Battelle Technology Partnership Practice

- Economic Development consulting arm of the world's largest independent non-profit research and development organization.
- Presently authoring the Nebraska Bioscience Roadmap 2010 for Bio Nebraska and the Nebraska Legislature Natural Resources Committee.

Project Purpose and Objectives

- **Project Purpose:** Prepare a comprehensive assessment of Nebraska's competitive position to set a baseline and guide future development actions.
- **Specific Project Objectives:**
 - *Update Target Industry Sector Opportunities*
 - *Develop an Overall Innovation Strategic Roadmap*
 - *Assess Current Economic Development Programs*
 - *Develop a Population and Workforce Retention and Attraction Strategy*

Nebraska is Well-Positioned in the Fundamentals Driving Economic Development

- *First, Nebraska has a diverse set of twelve primary industry clusters that are driving the state's economic base*

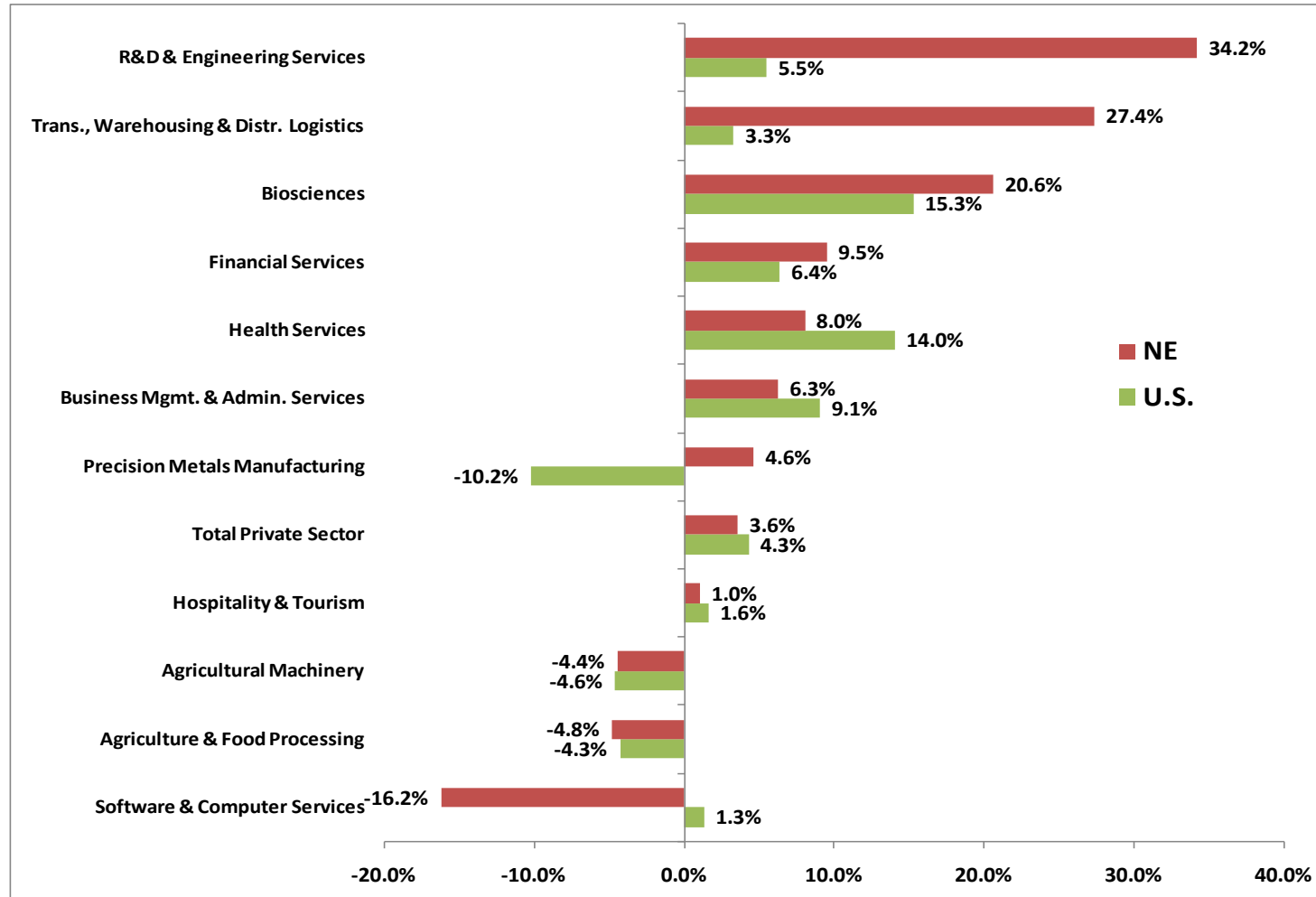
- 5 Industry Clusters Stand As **Current Strengths**
 - Specialized, Growing and Outpacing National Growth
 - Financial Services
 - Transportation, Warehousing & Distribution Logistics
 - Precision Metals Mfg.
 - Biosciences
 - Renewable Energy
(note: overlaps with biosciences in biofuels)

- 3 Industry Clusters Stand As **Emerging Strengths or Opportunities**
 - Not Specialized, Growing in Employment and may be Gaining Competitive Share
 - R&D & Engineering Services
 - Health Services
 - Hospitality & Tourism

- 4 Industry Clusters Stand As **Retention Targets**
 - Specialized, but Challenged in Employment and Competitive Share
 - Agriculture & Food Processing
 - Business Management & Admin. Services
 - Software & Computer Services
 - Agricultural Machinery

Strong Economic Performance of Primary Industry Clusters

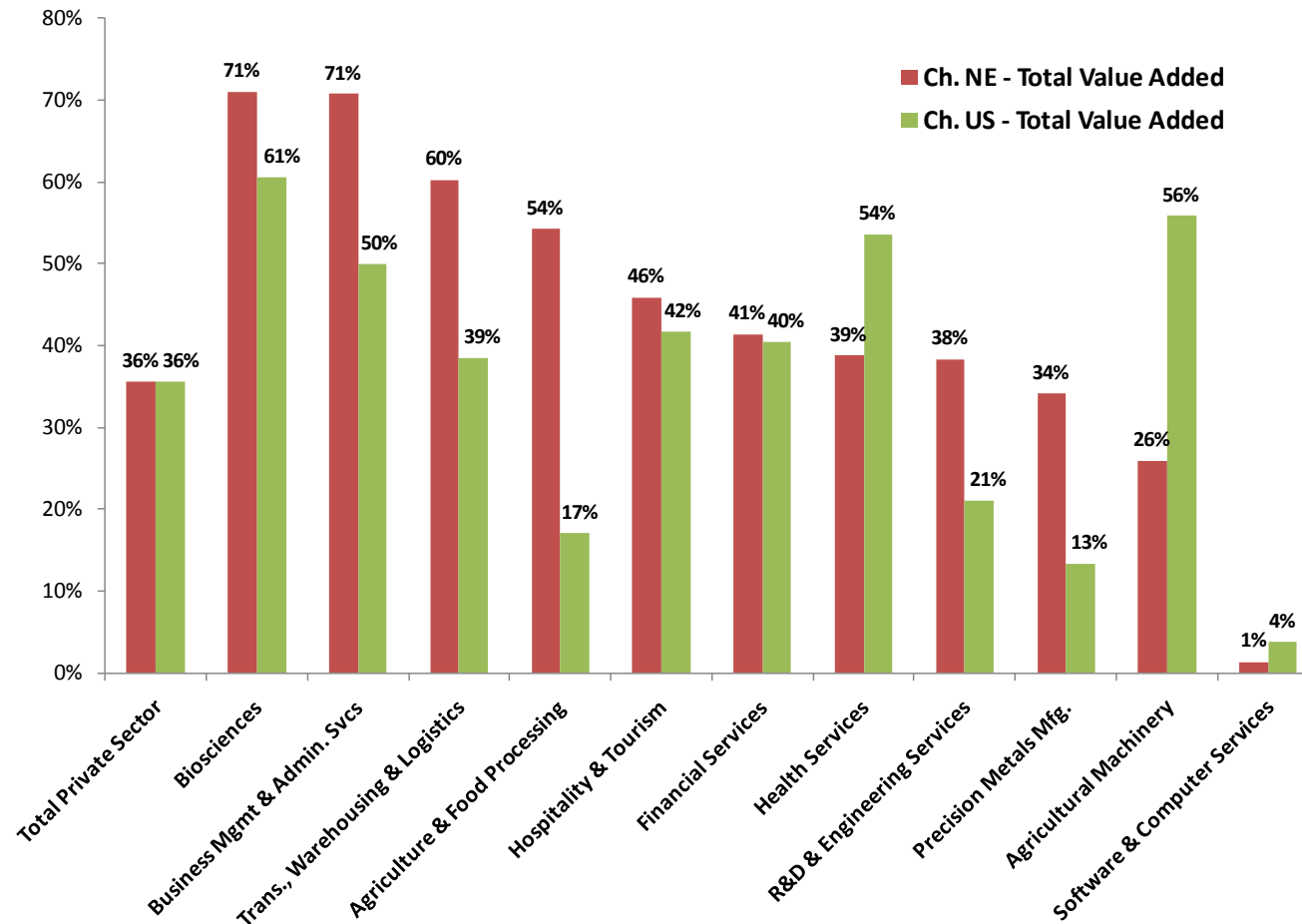
Recent Employment Changes of Nebraska's Industry Clusters, 2001-2007



Source: Battelle analysis of Bureau of Labor Statistics, QCEW data from IMPLAN.

Nebraska Has Outpaced the US in Economic Output Growth in Many Industry Clusters

Nominal Change in Value-Added by Industry Cluster, 2001-07

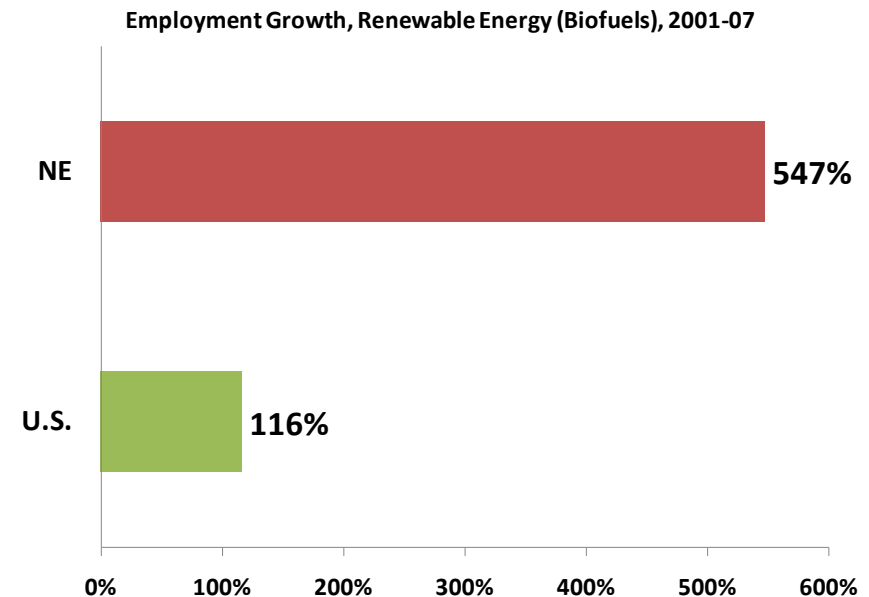


Value-added represents the difference between an industry's total output and the cost of its intermediate inputs; a measure of the cluster's contribution to GSP.

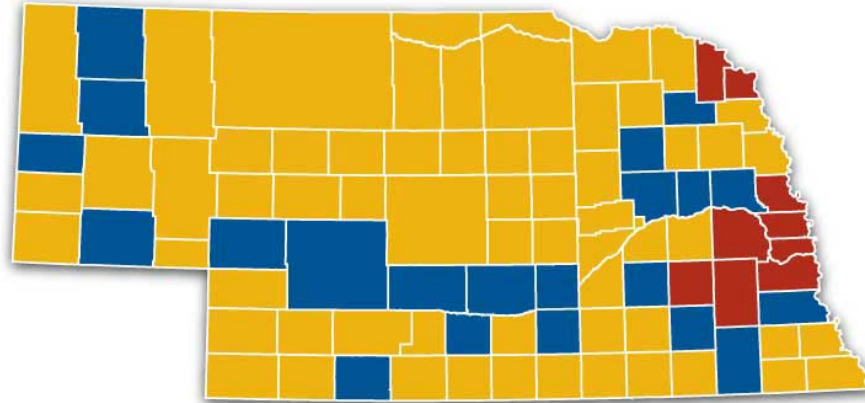
Source: Battelle analysis of IMPLAN Input/Output Model for NE and US. Value-Added estimates for Renewable Energy cluster are n/a.

Renewable Energy Cluster

- While the established and growing industry activity in NE ethanol and biofuels is captured in Federal industry employment data, much of the cluster is not isolated under the current NAICS industry structure (including Wind Turbines/Components, Geothermal, Solar)
- To supplement lack of existing data, Battelle built a statewide database of companies currently in renewable energy, identifying 28 companies spanning several subsectors:
 - Biofuels/Biomass (20+ companies)
 - Geothermal Energy
 - Hydropower Energy
 - Solar PV Energy
 - Wind Energy



Regional Industry Cluster Analysis Suggests Areas of Strengths for All Types of Regions in Nebraska



High-Growth* Clusters in Metro Areas:

- Biosciences
- Financial Services
- Health Services
- Hospitality/Tourism
- Precision Metals
- R&D/Eng. Services
- Trans/Warehousing, Distribution Logistics

*Job growth from 2001-07 in NE and gaining competitive share relative to the U.S. Cluster

High-Growth* Clusters in Counties with First Class Cities:

- Ag Machinery
- Business Mgmt & Admin. Services
- Financial Services
- Health Services
- Hospitality/Tourism
- R&D/Eng. Services
- Software & Computer Services

*Job growth from 2001-07 in NE and gaining competitive share relative to the U.S. Cluster

High-Growth* Clusters in Other Counties:

- Agriculture/Food Proc.
- Biosciences
- Bus. Mgmt & Admin. Svcs
- Hospitality/Tourism
- Precision Metals
- R&D/Eng. Services
- Software & Computer Services
- Trans/Warehousing, Distribution Logistics

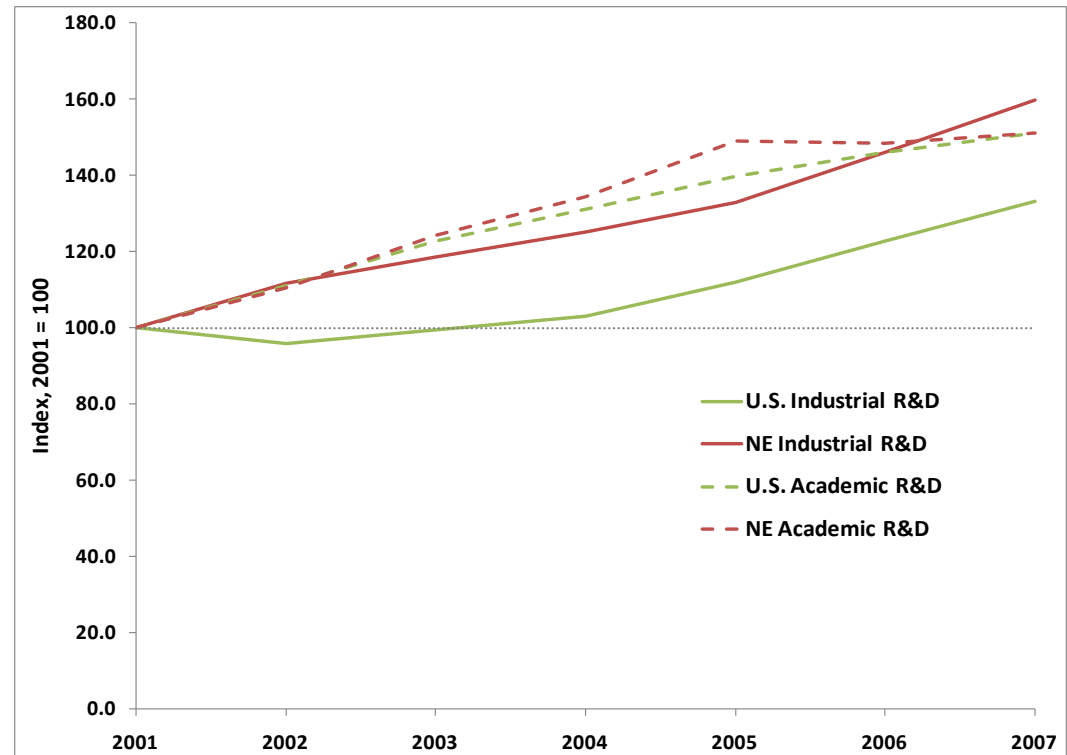
*Job growth from 2001-07 in NE and gaining competitive share relative to the U.S. Cluster

Clusters in alphabetical order

Growing R&D Base Reaching Critical Mass

- **University R&D reaching more than \$376M and is growing, just slightly off the U.S. pace**
 - University R&D in Nebraska (University of Nebraska System and Creighton University) rose 56% compared to 59% for the U.S. from 2001 to 2008
 - University technology transfer active, but few new start-ups
- **Industry R&D reached \$489M and growing robustly, outpacing the nation**
 - 60% for NE compared to 33% for U.S. for 2001 through 2007

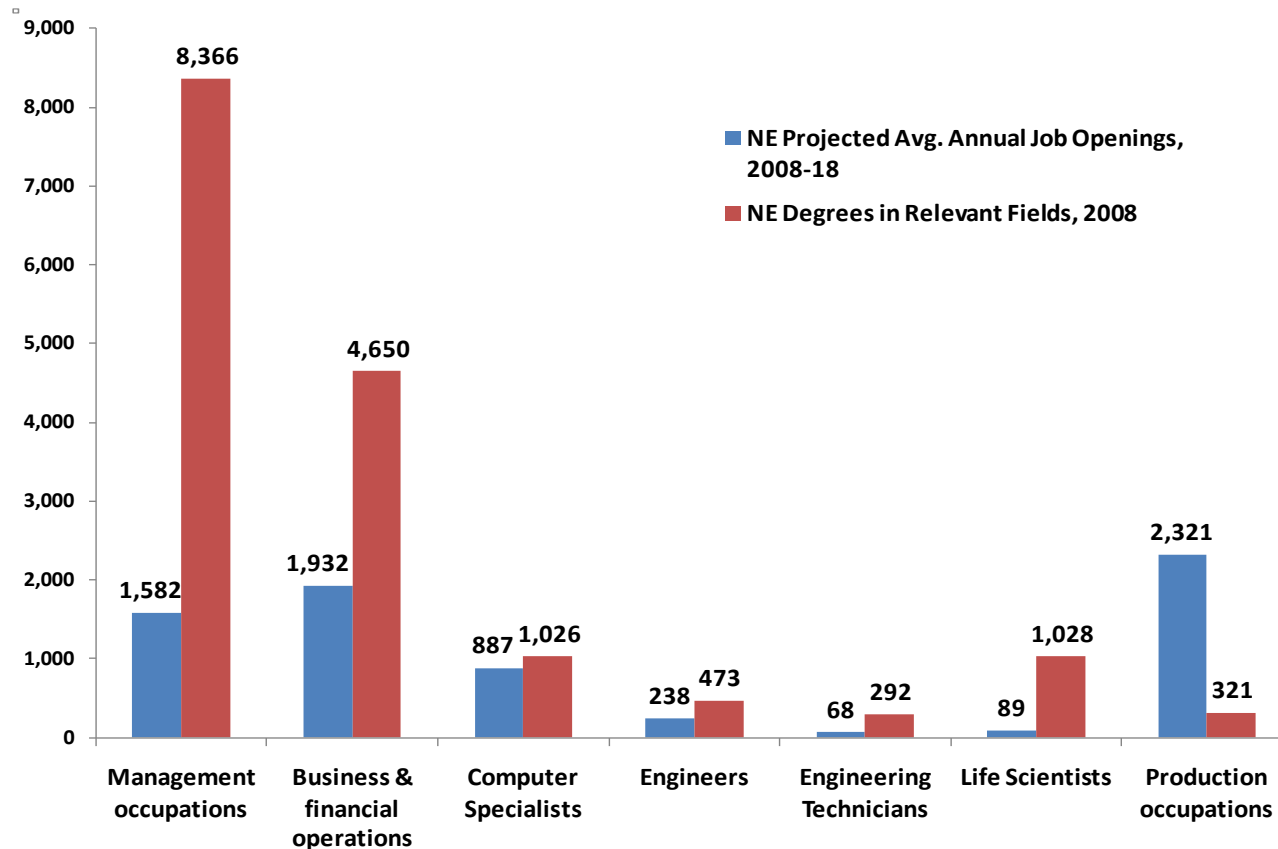
R&D Expenditures in Nebraska and U.S., by Industry and Universities



Source: National Science Foundation

Nebraska Has a Solid Talent Pipeline and Well Thought of Incumbent Worker Base

- High Skilled Graduates Meeting Demand for Job Openings



Source: Nebraska Department of Labor for Projected Job Openings and National Center for Education Statistics for Degrees Awarded

Still, Significant Challenges Facing Nebraska's Economic Development

Quantitative Analysis Found:

- Nebraska's primary industry clusters falling short in productivity
- Nebraska also falls short in the use of high skilled labor across its primary industry clusters
- Noticeable drop off in industry demand for high skilled occupations
- Shortfall in translating Nebraska's growing R&D base into new products and new companies

Industry & Stakeholder Interviews Found:

- Need to address issues related to demand and availability of high skilled workforce
- Lack of technology-based development programs
 - Entrepreneurial development
 - Risk capital
 - Technology commercialization
- "World of Silos" between industry and university research and talent generation
- Need to address modernization and deployment of technology to raise productivity
- Need for more ready sites and being able to offer upfront financial assistance in business recruitment
- Need for more organized approach to assist primary industry clusters

Note: Extensive field interviews completed: 62 industry interviews, 30 university interviews, 32 stakeholder interviews across local economic development, chambers, service providers, venture/tech development, and education and workforce. Plus focus group meetings held in April.

Nearly Every Industry Cluster is Lagging Behind in Value Added Per Employee

Industry Cluster	Nebraska Productivity, 2008	U.S. Productivity, 2008	NE/U.S.
Total Private Sector	\$ 69,164	\$ 83,310	83%
Agricultural Machinery	\$ 117,828	\$ 103,135	114%
Agriculture & Food Processing	\$ 84,717	\$ 58,609	145%
Biosciences	\$ 103,968	\$ 136,500	76%
Business Management & Administrative Services	\$ 89,350	\$ 111,466	80%
Financial Services	\$ 95,825	\$ 134,949	71%
Health Services	\$ 41,883	\$ 50,074	84%
Hospitality & Tourism	\$ 41,045	\$ 62,875	65%
Precision Metals Manufacturing	\$ 74,528	\$ 87,460	85%
Research, Development, & Engineering Services	\$ 70,977	\$ 76,656	93%
Software & Computer Services	\$ 87,072	\$ 106,787	82%
Transportation, Warehousing & Distribution Logistics	\$ 95,035	\$ 79,198	120%

Note: Value added is a measure of the additional contribution to economic output above the cost of inputs in the production of goods and services. Value added per employee standardizes the contribution towards economic output by the size of the workforce. It serves as a measure of productivity for workers as well as reflects the product mix towards higher or lower value of goods and services produced.

Source: Battelle analysis of IMPLAN Input/Output Model for NE and US. Value-Added estimates for Renewable Energy cluster are n/a.

Nebraska Falling Short in Use of High Skilled Talent Across Primary Industry Clusters

- High skilled talent includes occupations requiring high levels of post-secondary education including Scientists, Engineers & Architects, Management, Financial Operations, Computer & Math, and Healthcare Practitioners.

Nebraska Industry Clusters	High Skill Occupation Level for U.S.	High Skill Occupation Level for Nebraska
Agricultural Machinery	18%	12%
Agriculture & Food Processing	12%	7%
Biosciences	38%	22%
Business Management & Administrative Services	44%	35%
Financial Services	33%	35%
Health Services	47%	47%
Hospitality & Tourism	6%	6%
Precision Metals Manufacturing	17%	10%
Research, Development, & Engineering Services	61%	52%
Software & Computer Services	56%	36%
Transportation, Warehousing & Distribution Logistics	6%	2%

Shortfall in Industry Demand for High Skilled Workers in Nebraska

	Engineers & Architects	Scientists	Computer & Math Occupations
NE 2008 Employment	11,060	7,060	20,730
Higher/Lower Concentration than Nation	35% lower	20% lower	8% lower
NE Growth 2004-2008	-2.1%	- 14.8%	+ 2.5%
US Growth 2004-2008	+ 6.3%	+ 14.6%	+ 13.5%

Nebraska Falling Short in Translation of R&D Base

• Limited Entrepreneurial Activity

State	Avg. Annual Growth in New Business Establishments, 2001-05	Job Creation Rate from New Business Establishments, 2001-05	Inc. 500 Firms 2009
United States	12.2%	6.2%	n/a
Nebraska	10.7%	5.2%	3
Iowa	10.0%	4.7%	1
Kansas	11.1%	5.8%	3
Oklahoma	11.6%	6.1%	4
Tennessee	11.3%	5.8%	3
Utah	15.8%	7.4%	14
Virginia	12.1%	6.1%	35
Wisconsin	10.1%	4.9%	6

Source: U.S. Census Business Dynamics Survey and INC. magazine

• Little Risk Capital

- Investments in Nebraska totaled \$287 million since 2005 across 15 Nebraska companies + \$2.2 billion in buyout/acquisition of ConAgra's Trade Unit
- 18 individual NE companies received SBIR awards since 2005 across 49 funded projects with 44 Phase 1 and 8 Phase 2 awards.
 - Nebraska lagged benchmark states with next lowest being Kansas with 72 awards.

• Generation of IP & Technology Transfer Limited

- Patents remained steady, despite strong growth in R&D. Only slight increase since 2005 (averaging 269/year from 2005-09)
 - Nebraska lags in per capita patents—107 per 1M population compared with 255 per 1M for the U.S.
- Mixed performance in university technology transfer
 - Disclosures above U.S. average
 - Start-ups and License Income below U.S. average

Recap of Nebraska's Economic Development Situation: Solid Economic Fundamentals, But Pressing Need to Move Up the Value Added Curve

- ***Economic Fundamentals In Place***
 - Nebraska has a diverse and well-performing set of twelve industry clusters that are driving the state's economic base
 - Nebraska is reaching critical mass in having a research and development base across industry and universities
 - Nebraska also has a solid talent pipeline and well thought of incumbent worker base
- ***Need to Move Up the Value Added Curve***
 - Lower level of value-added leads to lower demand for skills and lower wages paid by industries in Nebraska
 - Added shortfall in translating Nebraska's growing research and development base into new products and new companies
 - Create stronger linkages between industry and university researchers in applied R&D, technology commercialization, and talent generation

Recommended Strategic Options for Nebraska

- Approach:
 - What is needed in Nebraska is not just new economic development tools to raise value added, but a concerted effort to deepen the level of connections between industry, higher education and talent in the state
- Focus on Three Major Initiatives as the Cornerstone for Nebraska Competitive Advantage:
 - A **Nebraska Industry Cluster Initiative** that includes tailored, industry-driven initiatives for workforce development, retention, expansion and business attraction targeted to Nebraska's industry clusters
 - A **Nebraska Talent Advantage Initiative** to connect college students/former Nebraskans with employers and to establish incentives for high skilled talent to stay in, or return to, Nebraska
 - A **Nebraska Innovation Initiative** to assist and enable growth-oriented emerging and existing companies in Nebraska to succeed

Proposed NE Industry Cluster Initiative

- **Objectives:**

- Address common needs of firms in a cluster from workforce development to technical assistance to market access
- Better organize and focus state economic development services to advance competitive industries
- Enable more broad-based initiatives to engage colleges and universities to address industry needs and opportunities

Proposed NE Industry Cluster Initiative

Key Program Functions	Timeline*	Costs
Enhance functionality of Nebraska Advantage Incentives for high impact projects.	Immediate	-0-
Establish state agency cluster resource teams, each with a lead DED staff person, with initial focus on “bio solutions”.	Immediate	-0-
Establish a Nebraska Strategic Opportunity Fund for site and facility development.	Immediate	\$10 - \$20 million annually
Provide competitive, matching funds for project-based “cluster activities,” including formation of industry-led cluster organizations and industry-higher education collaboration centers.	Near Term	\$2 million annually
Establish a major tourism destination (Mahoney-type) in the Sandhills that capitalizes on the region’s unique scenic, ecological, and recreational advantages.	Long Term	TBD

*Timeline: Immediate, within 1 year; Near Term, 1-2 years; Long Term, over 2 years

Proposed Nebraska Talent Advantage Initiative

- **Objectives:**

- Improve sharing of information on current and developing career opportunities in Nebraska with web-based tools
- Strengthen connections between students and companies
- Address high demand, skill shortage areas
- Provide incentives to recruit high skilled workers, especially targeting former Nebraskans to enable growth of the state's industry base

Proposed Nebraska Talent Advantage Initiative

Key Program Functions	Timeline*	Costs
Promote on-site and distance-related postsecondary student internships across the state with businesses in economic base industries.	Immediate	\$1 million annually
Develop and market a Nebraska Jobs Search Site (NEworks) in collaboration with the Department of Labor, to serve as a portal and networking vehicle with specific emphasis on connecting students and graduates with employer needs in targeted, high skill occupations.	Immediate	\$1 million annually
Revamp Career & Technical Education in K-12 targeted to high demand, high shortage occupations, including through virtual high school enabled by expanded broadband.	Immediate	\$1 million annually
Enhance entrepreneurial opportunities by providing mentoring, training and increased capital access, particularly for high growth businesses.	Immediate	\$500,000
Create targeted skill centers at post-secondary institutions for documented skill shortage areas.	Near Term	\$500,000
Provide for incentives in Science, Technology, Engineering, and Math (STEM) occupations for graduates in high wage, high skilled fields to work in Nebraska in target industry clusters for which there is a critical skill shortage (similar to Rural Health Opportunities Program—RHOP).	Near Term	TBD

*Timeline: Immediate, within 1 year; Near Term, 1-2 years; Long Term, over 2 years

Proposed Nebraska Innovation Initiative

- **Objectives:**
 - Improve the translation of Nebraska's R&D base into new products and new companies
 - Support development of growth-oriented start up companies
 - Upgrade the value added activities and modernize Nebraska's existing industry clusters

Proposed Nebraska Innovation Initiative

Key Program Functions	Timeline*	Costs
Expand Small Business Innovation Research (SBIR) outreach efforts.	Immediate	\$300,000 annually
Enact an angel investment tax credit.	Immediate	-0-
Provide a financing mechanism for modernization and expansion to manufacturing companies tied to investments in improved productivity and higher wages – modernization fund.	Immediate	\$15 million
Develop applied industry-university research matching grants for next generation product and process innovations.	Immediate	-0-
Revise Nebraska Advantage Tiers to provide incentives for manufacturing firms to modernize their business operations in a manner that generates increases in sales and raises wage levels.	Immediate	-0-
Update efforts in modernization and technology advancement for manufacturing companies to also include a matching fund for product design, prototyping and testing activities.	Immediate	\$400,000
Adopt and support minimum standards for broadband internet service that continually exceed any Federal standards to help grow the mobile and entrepreneurial economy.	Immediate	TBD
Establish a statewide commercialization service to mentor and advise technology-oriented entrepreneurs and early stage companies.	Immediate	\$500,000 annually
Establish a private sector-driven Nebraska Innovation and Technology Development Organization.	Near Term	\$750,000 annually for operation
Create a private sector driven venture financing entity for equity, near-equity, modernization and working capital.	Long Term	One time funding—up to \$50 million

*Timeline: Immediate, within 1 year; Near Term, 1-2 years; Long Term, over 2 years

Sources of Funding

- It is important to maximize funding from reallocation of existing programs that are not serving to advance the state's critical economic development needs and by tapping existing sources of revenues.
- **Suggested Reallocation of Existing Programs**
 - Redeploying use of variety of programs, such as Microenterprise Development Fund, Value-Added Grants, Experimental Program to Stimulate Competitive Research (EPSCoR) and Nebraska Heritage Fund, among others
 - Support venture financing with de-federalized Community Development Block Grant (CDBG) reuse funds
 - Reallocation of a portion of existing Nebraska Advantage tax credits to provide for upfront assistance for identified projects
 - Redeploy use of Nebraska Training and Support Trust Fund
 - Redeploy state general appropriations for university research initiatives towards applied R&D with industry and talent connections
 - Consider broadening Affordable Housing Trust Fund to allow for support and development of business/industrial buildings and sites
- **Suggested Existing Revenue Sources to Tap**
 - Seek dedicated source(s) from existing state taxes, utilities fees, other fees and settlements generated by industry activities, including from the cigarette tax and documentary stamp tax
 - Consider broadening use of Lottery Funds for educational purposes to cover Nebraska Talent Advantage functions and other talent actions
 - Consider use of Nebraska Investment Finance Authority (NIFA) to fund modernization fund