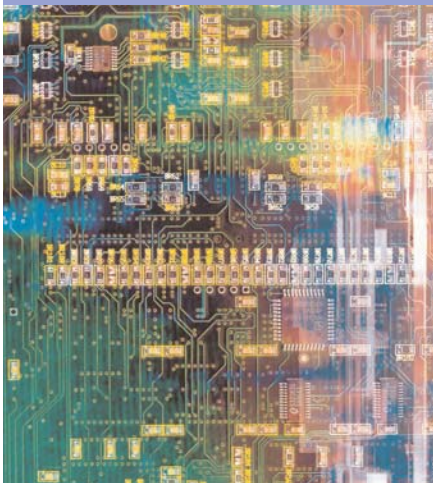




S&T STRATEGY UPDATE
AND ACTION PLAN 2004



**MOVING FORWARD:
ACCELERATING IDAHO'S
INNOVATION ECONOMY**



PREPARED FOR:
Governor's Science and Technology
Advisory Council

PREPARED BY:
Office of Science and Technology
Idaho Commerce and Labor

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Idaho's Science and Technology Industry Sector

The science and technology industry sector includes a wide range of industries, some of which are generally recognized as “high tech” sectors such as biotechnology, computers and semiconductors, and others which are commonly thought of as traditional manufacturers, such as motor vehicles, industrial machinery, and medical equipment and supplies. Industries are designated as science and technology sectors because a significant percentage of their workforce is composed of scientists and engineers and because they conduct a significant amount of R&D. An examination of Idaho's science and technology industries in 2000 revealed that

- Idaho's science and technology industries grew rapidly between 1989 and 1998.
- Idaho's science and technology industries paid significantly higher wages than do other sectors of the economy.
- Idaho had strong specializations in semiconductors and electronic computers and engineering services.
- Computer programming and computer related services were growing rapidly and appeared to be emerging Idaho technology clusters.

Much has happened since 2000 that has affected the nation's and Idaho's economy – the September 11th tragedy, a national recession and continued globalization, among others. As a first step in revisiting Idaho's science and technology strategy, the Governor's Council on Science and Technology decided to look at what changes had occurred in Idaho's science and technology economy to determine whether these changes suggest that the state's strategy needs to be adjusted to reflect changes in the marketplace.

The Council found that Idaho's science and technology sector has continued to perform well, outpacing the national economy in terms of employment and establishment growth. It has continued to diversify with rapid growth in the management and scientific consulting, commercial industry machinery, soap and toilet preparation manufacturing and computer system design industries. The growth occurring in many of Idaho's science and technology sectors suggests that these industries have the potential to become key drivers of Idaho's economy.

The following section examines Idaho's science and technology industry sector.

IDAHO'S SCIENCE AND TECHNOLOGY SECTOR

One out of every ten Idaho workers, more than 44,000 people, was employed in science and technology industries in 2002, approximately the same percentage of workers employed in these industries nationally¹. These workers earned \$2.25 billion in wages that year. (See Table A-1)

¹ This report uses a definition of science and technology industries developed by the U.S. Bureau of Labor Statistics (BLS). BLS classified industries as high-technology based on the employment of scientific and technical personnel as well as research intensity.

Table A-1: Idaho's Technology Industry Sector 2000 – 2002

Metric	IDAHO		UNITED STATES	
	Science & Technology Sector	Total Private Sector	Science & Technology Sector	Total Private Sector
Establishments, 2000	2,337	42,539	550,968	7,646,318
Establishments, 2002	2,694	43,884	575,861	7,839,903
Growth Rate, 00-02	15.3%	3.2%	4.5%	2.5%
Employment, 2000	47,397	461,438	10,864,210	110,023,983
Employment, 2002	44,409	465,832	9,877,811	107,577,300
Growth Rate, 00-02	-6.3%	1.0%	-9.1%	-2.2%
Share of Private Sector, 2002	9.5%	n.a.	9.2%	n.a.
Location Quotient, 2002	1.04	n.a.	n.a.	n.a.
Annual Wages, 2002 (\$billions)*	\$2.3	\$12.9	\$608.8	\$3,930.8
Average Annual Wage per Employee, 2002*	\$50,870	\$27,754	\$61,249	\$36,539

Source Battelle calculations based on ES-202 data. Idaho ES-202 data provided by the Idaho Department of Labor. United States ES-202 data obtained from the US Bureau of Labor Statistics.

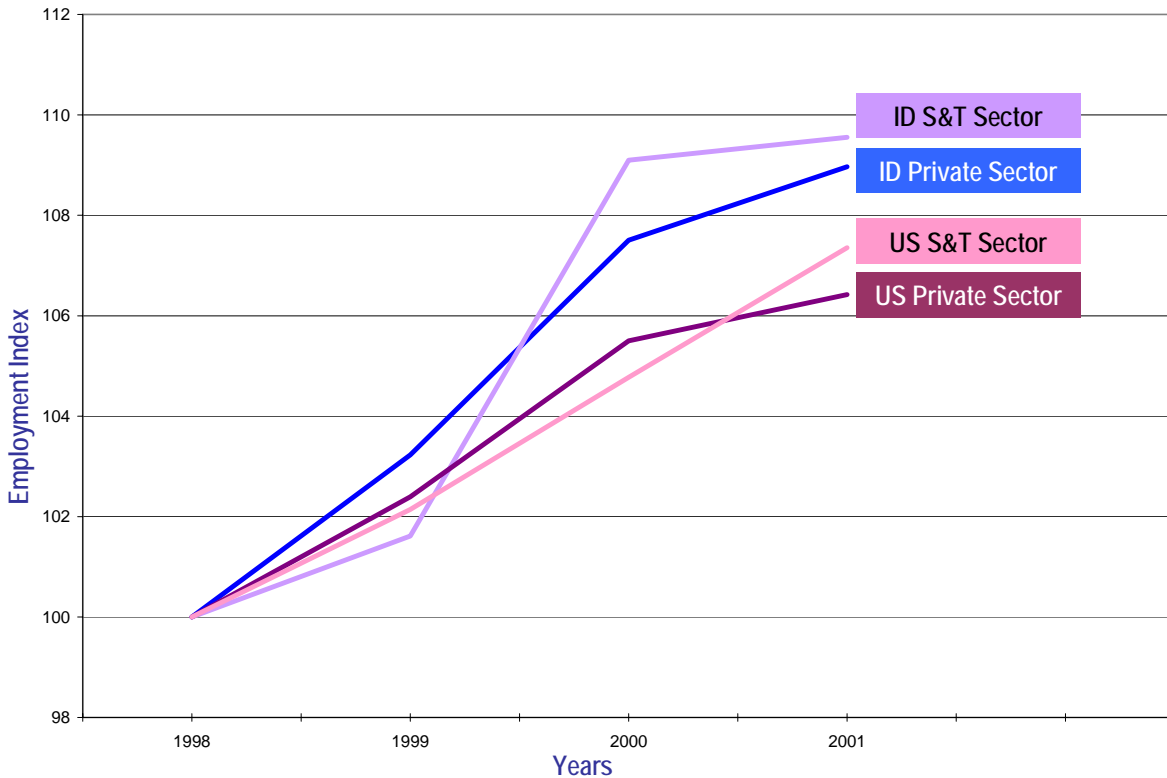
* All wage data base on 2002 ES-202 data from the Minnesota Implan Group.

While employment in Idaho's science and technology sector declined by 6.3 percent between 2000 and 2002, this reflects the downturn in the technology sector due to the dot.com bust and the general economic slowdown. Idaho's employment decline, however, was less than the national level, where employment in the science and technology sector declined by 9.1 percent during the same time period.

The growth in the number of science and technology establishments has well outpaced the national trend. Science and technology establishments grew in Idaho at an impressive rate of 15.3 percent. Nationally, establishments only grew by 4.5 percent. This well above average growth indicates a science and technology sector in Idaho that possesses the potential to become a major employment growth engine for the state's overall economy.

Historically, total employment growth, and specifically employment in Idaho's science and technology industries, has continually outpaced growth at the national level. Between 1991 and 2000, employment in Idaho's science and technology sector grew at an average annual rate of more than 4 percent. During the economic boom of the late 1990s, from 1998 to 2001, Idaho's science and technology sector experienced overall growth of 10 percent and outpaced the healthy 7 percent growth rate at the national level. (See Figure A-1)

Figure A-1: Idaho and US Employment Index, 1998 – 2001



Source: Battelle calculations based on ES-202 and *County Business Patterns* data. Idaho ES-202 data provided by the Idaho Department of Labor. United States *County Business Patterns* data obtained from the US Census Bureau.

IDAHO’S SCIENCE AND TECHNOLOGY SUBSECTORS

Idaho has strong specializations in semiconductor manufacturing, agricultural chemicals, computer equipment manufacturing, and scientific R&D services. When Idaho’s science and technology industry is further delineated into key subsectors, analysis indicates that the state has strong specializations in four subsectors. A state is considered to have a specialization in a particular industry when it has a location quotient (L.Q.) of 1.2. A L.Q. measures the level of employment concentration within a state relative to the nation. A L.Q. of 1.2 means that the state is 20 percent more concentrated in that industry sector than is the nation. As shown in Table 3, employment in both the semiconductor industry and the agricultural chemicals, pesticides, and fertilizer industry is more than 5 times as concentrated in Idaho than nationally. The computer equipment industry is more than 4 times as concentrated, and scientific R&D services is more than 3 times as concentrated in Idaho compared to the nation. In addition, Idaho has specializations in motor vehicle structural frame manufacturing and industrial machinery. (See Table A-2)

Table A-2: Idaho's Science and Technology Key Industries²

NAICS Code	Industry	2002 Employment	IDAHO Employment Growth Rate 00-02	United States Employment Growth Rate 00-02	L.Q. 2002
5416	Management, Scientific, & Technical Consulting Services	2,038	45.5%	2.3%	0.64
3256	Soap, Cleaning Compound, & Toilet Preparation Mfg	385	14.5%	-8.4%	0.74
3333	Commercial & Service Industry Machinery Mfg	366	11.4%	-13.5%	0.66
3391	Medical Equipment & Supplies Mfg	1,022	8.8%	-1.1%	0.77
5413	Architectural, Engineering, & Related Services	4,860	3.5%	0.1%	0.90
3253	Agricultural Chemicals, Pesticides, & Fertilizer Mfg	1,004	3.0%	-8.1%	5.27
5415	Computer Systems Design & Related Services	2,659	-0.7%	-13.0%	0.54
3259	Other Chemical Product & Preparation Mfg	410	-1.1%	-11.0%	0.84
3362	Motor Vehicle Structural Frames	1,296	-7.0%	-18.1%	1.94
3344	Semiconductor & Other Electronic Component Mfg	12,623	-7.1%	-22.4%	5.57
3341	Computer & Peripheral Equipment Mfg	4,985	-9.6%	-14.7%	4.66
5417	Scientific Research & Development Services	7,371	-10.8%	3.1%	3.20
3332	Industrial Machinery Mfg	779	-24.3%	-19.0%	1.38

Source Battelle calculations based on ES-202 data. Idaho ES-202 data provided by the Idaho Department of Labor. United States ES-202 data obtained from the US Bureau of Labor Statistics.

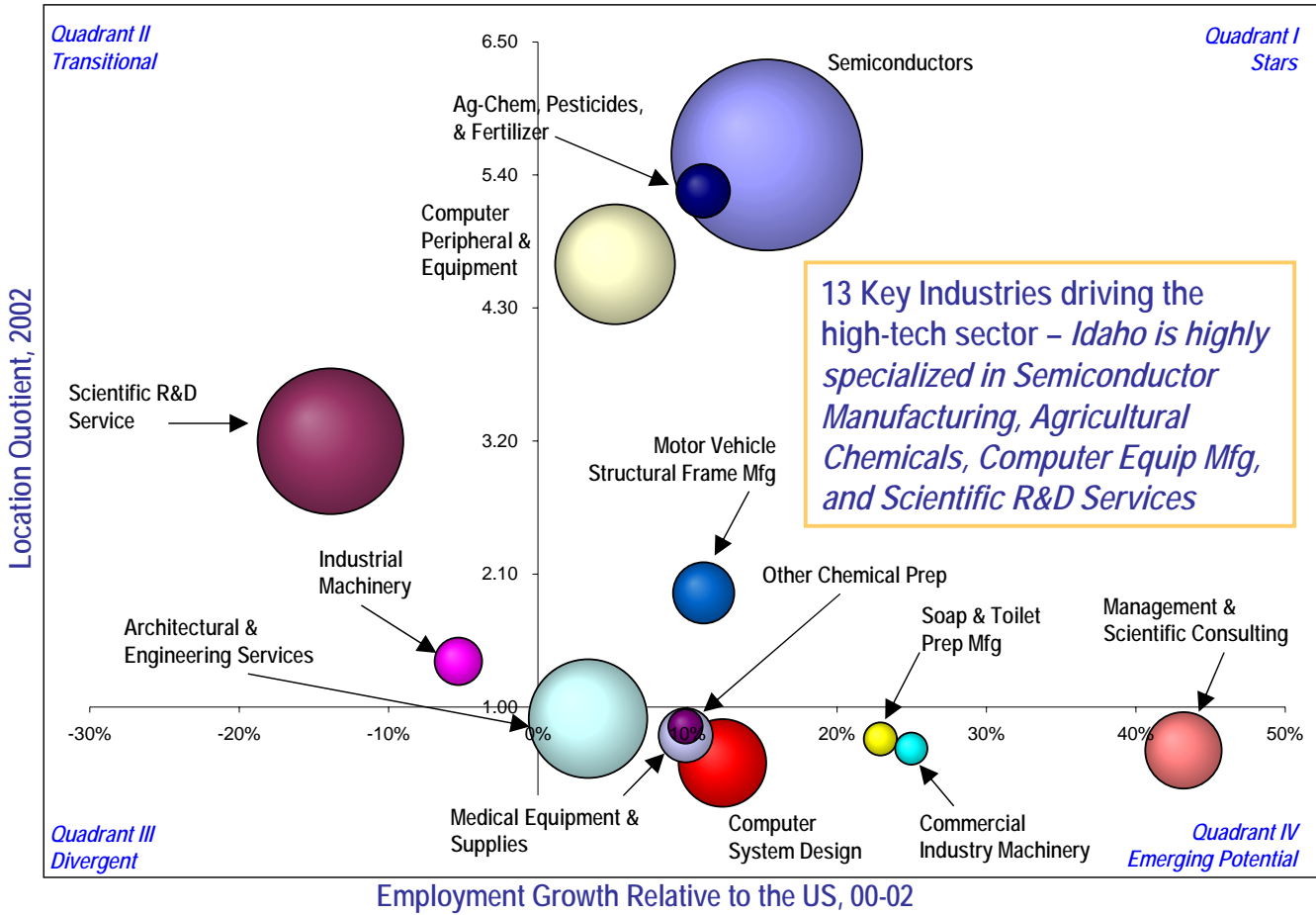
Note: Data in bold represents large employment base, above average employment change, or regional specialization

In addition to having significant concentration in a variety of subsectors, the majority of Idaho's technology industries exceeded the national growth trend. Between 2000 and 2002, Idaho's fastest growing technology sector was management and scientific consulting. This segment is growing at a rate of 45.5 percent, which is significantly above the national growth rate of 2.3 percent. The semiconductor industry, which is the largest technology sector in Idaho in terms of employment, also showed strong relative performance, which is significant since the industry experienced a sizable decline in employment nationally. Scientific R&D, and industrial machinery were the only sectors the demonstrated below average growth rates. These industries experienced declines in Idaho greater than they did at the national level. (See Table 2)

Figure A-2 illustrates the strength of Idaho's technology industry sectors as measured by employment size (the area of bubble), level of specialization (vertical axis), and employment growth rate for the region relative to the United States (horizontal axis). The most robust base for economic development is likely to consist of those industries in which the state is specialized, there is substantial employment, and that are growing faster than national trends or overall regional economic activity.

² Key industries in the state of Idaho were selected based on three criteria: 1.) Industries possessed an employment concentration of 1.20 or greater; 2.) Industries exceeded national trends between 2000-2002. To avoid overstating trends, only those industries with an employment level of at least 300 were analyzed; 3.) Large industries with an employment based equal to or greater than 1,000.

Figure A-2: Idaho Science and Technology Industry Performance



Source: Battelle calculations based on ES-202 data. Idaho ES-202 data provided by the Idaho Department of Labor. United States ES-202 data obtained from the US Bureau of Labor Statistics.

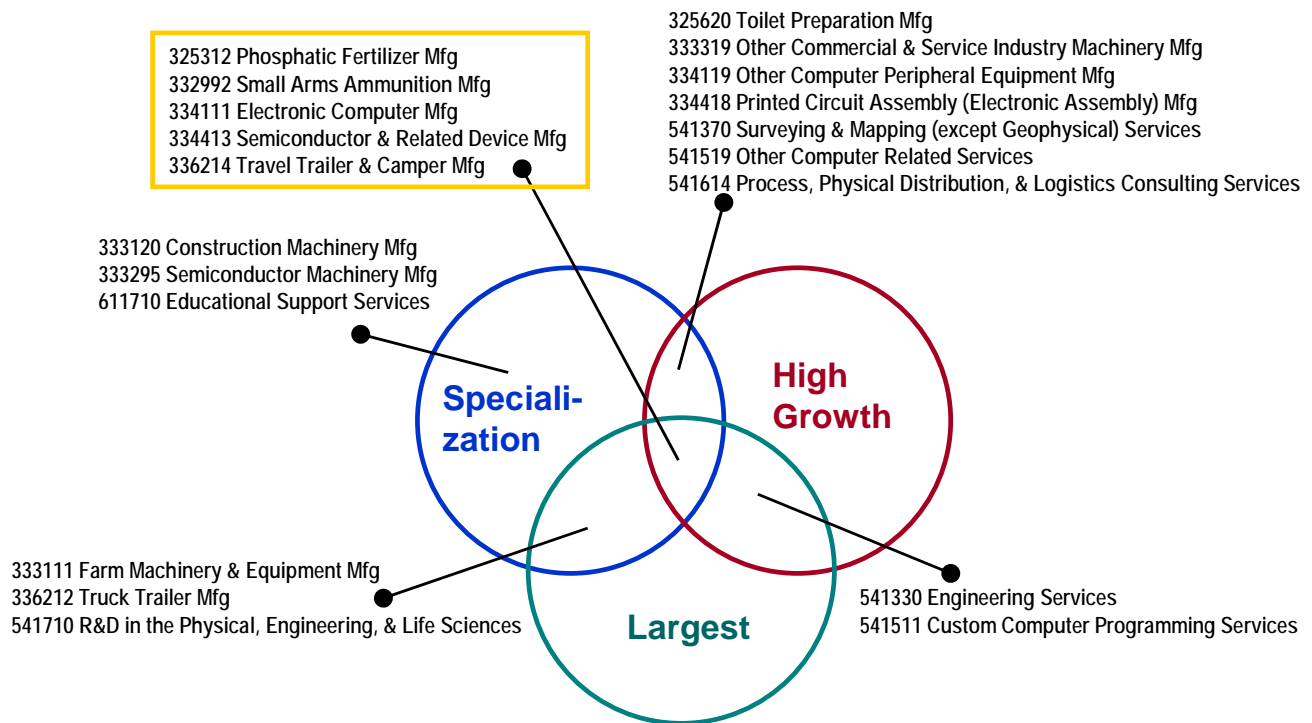
Quadrant I contains subsectors that are growing and regionally specialized – they are the stars of the current technology economy. Quadrant II depicts industry subsectors that are regionally specialized but not generating significant net new jobs. Subsectors within this quadrant are part of the state’s core industrial strength. However, absent future growth, the specialization could become threatened. Quadrant III is comprised of subsectors with no specialization and negative comparative growth. Industries in this quadrant face considerable obstacles in becoming major industrial drivers. Quadrant IV represents segments that are growing and emerging. These subsectors are not yet specialized but are growing faster than the nation and could potentially leap forward as a major industry driver.

Idaho has four industry sectors that are exceeding the national growth trend and are considered regionally specialized – semiconductors, agricultural chemicals pesticides and fertilizers, computer peripheral equipment, and motor vehicle structural frames. However, what is even more significant about Idaho’s science and industry sectors for the future is the number of science and technology industry sectors that are on the verge of moving into Quadrant

I, thus becoming major industry drivers. Management and scientific consulting, commercial industry machinery, soaps and cleaners, and computer system design, in particular, are growing very rapidly and could therefore develop into specializations if their growth continues.

Finally, Idaho’s science and technology sector is comprised of twenty niche areas that have the potential for development. Figure A-3 depicts the performance of key NAICS industries in the State of Idaho.

Figure A-3: Twenty Niches within Idaho’s Science and Technology Sector



The industries were chosen based on three criteria:

1. Industries that possessed an employment concentration of 1.20 or greater were determined to be a regional specialization;
2. Industries whose encompassing subsectors grew above the national growth rate from 2000-2002 were determined to be high growth. To avoid overstating trends, only those industries with an employment level of at least 300 were analyzed; and,
3. Large industries were classified based on employment size equal to or greater than 1,000.

Detailed industries that fall within the confluence of all three circles are major subsector strengths. These industries exhibited large employment bases, significant specializations, and an above average performance between 2000 and 2002. These industry segments are essential components to target and are highlighted in the yellow box. These detailed industries represent

platforms from which to strengthen Idaho's science and technology subsectors, thereby ensuring economic growth.

CONCLUSIONS

While it is impossible to develop completely comparable data for each of the technology industries that was included in the 2000 strategy, due to a change in industrial classification codes and the need to use a variety of data sources, it would appear that the composition of Idaho's science and technology base has not changed significantly over the last four years. Key technology niches identified in 2000 as growing sectors, such as semiconductors, electronic computers, and scientific R&D services, remain critically important industries and continue to demonstrate strong economic growth potential for the state.

Furthermore, despite recent loss of employment in some key technology industries as a result of the economic slowdown, these trends have occurred throughout the country. The important issue to emphasize is that Idaho's overall science and technology sector has continued to grow since 1991 and is diversified. The growth being experienced in many of Idaho's science and technology industry sectors indicates that if nurtured, these industries have the potential for becoming key contributors to Idaho's economy. Targeting economic initiatives to support existing industry strengths and encouraging and stimulating emerging industries, Idaho can create a more durable and vibrant science and technology sector.