Investing in Portland's Future

PDC

PORTLAND DEVELOPMENT COMMISSION

Economic Development
High Tech
Target Industry Plan

Fiscal Year 2005/2006

November 25, 2005

High Tech

Industry Definition/Summary

Adopted by the Portland Development Commission as a key component of its economic development strategy, the high tech industry encompasses computer and computer-related industries. It includes makers of semiconductors, electronic and computer equipment, material suppliers, software, communications products, and information and design services. PDC is interested in this sector because of its explosive growth over the past couple decades in the region, and its relatively high wages.

There are over 1,700 high tech companies presently operating in the Portland metropolitan area, employing more than 66,000 workers. Between 1990 and 2000, employment in Portland's high tech sector grew at a 5.8% annual rate, significantly above the national average. Average annual salaries paid to high tech employees are over $78,500. The total payroll in this sector is nearly two billion dollars while the sector itself sells about $16.1 billion in goods and services annually. Portland and Oregon are home to some of the world leaders in high technology such as Intel, Tektronix, Hewlett-Packard, Siltronic, In-Focus, and Novellus.

There are a few clusters within the broader high tech industry in which Portland excels and as such directs additional effort towards. These clusters include:

- **Silicon / Semiconductors**
  - This cluster includes firms engaged in the design and manufacture of semiconductors (including solar cells), firms that produce silicon wafers, and firms that manufacture/supply the equipment necessary to produce silicon ingots, wafers and semiconductors
  - Major local firms in this cluster include Siltronic Corp., Intel, Lattice, IDT, Triquint, Sumitomo, WaferTech, Sharp Microelectronics, Linear Technologies, SEH, MicroChip, and Tokyo Electron America
  - Key stakeholders include: SEMI PACIFIC NORTHWEST North West, American Electronics Association, OECDD, Portland Regional Partners for Business, Portland Ambassadors.
  - Support industries include the following types of firms: Sheet Metal and precision machining, Plastics, Assembly, metal and electrical, PCB layout, Silk screening and graphics, Software and specialized engineering consulting, and Engineering workforce.
- **Software**
  - Oregon is home to more than 2,000 software companies, the majority located in the Portland metropolitan area. These companies employed almost 24,000 people in 2000, contributing approximately $1.49 billion in payroll to the local economy annually. Oregon's software industry grew by 75% in the 1990's.
  - Today, the local software industry remains strong, particularly in the following subclusters: Electronic Design Automation (EDA), financial solutions, outsourced software development, open source, educational and training software, embedded software, information technology, nanotechnology, and healthcare applications.
  - A few key Portland area software companies include:, Vernier Software, Webtrends, Extensis, Inspiration Software, and McKesson.
- **Display Technology**
  - This cluster includes firms engaged in the design and manufacture of video or computer monitors, projectors, display devices such as LCD or OLED, display controller IC's and firms that manufacture/supply the equipment necessary to produce monitors, projectors, display devices and display controller IC's

- Major local firms in this cluster include: Barco Medical Imaging Systems, Clarity Visual Systems, 3M, Delta Electronics, Epson, Intel, Planar, PlusVision, and Sharp Microelectronics
- Key stakeholders include: The Society for Information Display (SID), the Oregon Display System Industry Consortium (ODSIC), The Video Electronics Standards Association (VESA), OECDD, Portland Regional Partners for Business and The Portland Ambassadors
- Support industries include the following types of firms: electronic assembly, precision machines, software and silicon related industries.

Employment Trends

The City of Portland, along with Clackamas, Multnomah and Washington counties, continues to have a concentration of high tech industries. Identified as a locally concentrated cluster in 2002 as part of a citywide economic development strategy, an estimated 48,596 jobs were attributed to high tech in the Portland-Salem Metro area in 1997. Using the smaller geography of Clackamas, Multnomah and Washington counties, employment as of 2004 in high tech is estimated to be 45,458 jobs. This is a decrease from 2001 when employment for the cluster was an estimated 56,451.

Overall, the high tech cluster is more concentrated in the 3-county Portland region than the West Coast states of California, Oregon and Washington. In 2001 high tech had a local concentration[1] of 1.40. In 2004 the local concentration in the Portland region has increased to 1.48. This means that, on a percentage basis, the employment loss that has occurred in the Portland region from 2001 is less than what has been lost during the same period on the West Coast. Within high tech, the computer and electronic product manufacturing sector is the largest employer in the Portland region, with an estimated 31,844 jobs in 2004.

Table 1 shows the employment and changes that have occurred from 2001 to 2004 in distribution and logistics in the Portland region (Clackamas, Multnomah and Washington counties) compared to the West Coast (California, Oregon and Washington).

[1] The local concentration ("location quotient" or LQ) is the calculated ratio between the local economy and the economy of some reference unit, in this case the West Coast states. This ratio is calculated for all industries to determine whether or not the local economy has a greater share of that industry than expected. If an industry has a greater share than expected of a given industry, then that "extra" industry employment is assumed to have a greater concentration and importance to the local economy because those jobs are above what a local economy should have to serve local needs. If an industry has a concentration of more than 1, it is assumed to be locally concentrated. Anything below 1 is not locally concentrated.

Table 1
High Technology Employment Performance in the Portland Region from 2001 to 2004

		2001		2004							
NAICS	**Industry**	**West Coast Employment**	**3 County Employment**	**West Coast Employment**	**3 County Employment**	**3 County Change**	**3 County % Change**	**West Coast % Change**	**Shift-share**	**LQ 2001**	**LQ 2004**
334	Computer & Electronic Product Manufacturing	503,291	38,500	385,966	31,844	-6,656	-17%	-23%	0.06	1.75	1.95
5112	Software Publishers	96,174	7,075	88,550	4,798	-2,277	-32%	-8%	-0.24	1.68	1.28
5415	Computer Systems Design and Related Services	239,074	8,282	195,083	6,015	-2,267	-27%	-18%	-0.09	0.79	0.73
518	Internet Service Providers, Web Search Portals, & Data Processing Services	80,085	2,594	54,515	2,801	207	8%	-32%	0.40	0.74	1.21
	High Technology Total	**918,624**	**56,451**	**724,114**	**45,458**	**-10,993**	**-19%**	**-21%**	**0.02**	**1.40**	**1.48**

3 County = Clackamas, Multnomah & Washington
West Coast = California, Oregon & Washington

Source: Oregon Labor Market Information System Covered Employment and Wages; U.S. Department of Labor Bureau of Labor Statistics

Wages

The average annual wage paid in the Portland region by the high tech cluster in 2004 was $82,126. This is lower than the average wage paid in high tech for the West Coast. The average wage paid in the Portland region in high tech in 2004 is higher than the annual wage of $72,719 paid in 2001. At the same time, West Coast annual wages increased from $88,440 to $92,506 over the same period. Overall, the Portland region's average wages for high tech are lower than the west coast average, but are increasing at a greater rate.

Within high tech, software publishing has the highest wages in the Portland region. In 2004, software publishing had an average wage of $97,215 in the Portland area compared to $116,986 for the West Coast.

Table 2 compares 2001 and 2004 Portland area average wages to the West Coast along with the change for the high tech industry.

Table 2
High Technology Wage Performance in the Portland Region from 2001 to 2004

		2001		2004					
NAICS	Industry	West Coast Avg Wage	3 County Avg Wage	West Coast Avg Wage	3 County Avg Wage	3 County Change	West Coast Change	3 County % Change	West Coast % Change
334	Computer & Electronic Product Manufacturing	$80,125	$74,724	$87,668	$82,513	$7,789	$7,543	10%	9%
5112	Software Publishers	$144,477	$70,707	$116,986	$97,215	$26,508	-$27,491	37%	-19%
5415	Computer Systems Design and Related Services	$86,807	$71,630	$87,580	$74,573	$2,943	$772	4%	1%
518	Internet Service Providers, Web Search Portals, & Data Processing Services	$78,279	$56,239	$104,631	$68,095	$11,856	$26,352	21%	34%
	High Technology Total	**$88,440**	**$72,917**	**$92,506**	**$82,126**	**$9,209**	**$4,066**	**13%**	**5%**

Source: Oregon Labor Market Information System Covered Employment and Wages; U.S. Department of Labor Bureau of Labor Statistics

Observations

Overall, high tech in Portland has followed a nationwide employment trend. From 2001 to 2004 high tech employment throughout the United States declined 19 percent. The West Coast declined at a slightly faster rate, while Oregon and Portland declined at a rate closer to the national average. Table 3 shows the employment and change for High Technology throughout the United States compared to the West Coast, Oregon and the Portland region.

Table 3
High Technology Employment and Change in the United States, West Coast, Oregon and Portland Region from 2001 to 2004

	2001	2004	Change	% Change
United States	3,785,096	3,076,803	-708,293	-19%
West Coast	918,624	724,114	-194,510	-21%
Oregon	73,532	60,041	-13,491	-18%
Portland 3-County Region	56,451	45,458	-10,993	-19%

Source: Oregon Labor Market Information System Covered Employment and Wages; U.S. Department of Labor Bureau of Labor Statistics

The decline in employment from 2001 to 2004 in the Portland area for high tech occurred at a time when Oregon employment across all industries increased 3 percent. So, while high tech had an overall smaller employment decline than the West Coast as a whole, the industry lost jobs at the same time that overall employment increased throughout the State. Table 3 compares high tech to overall employment trends from 2001 to 2004 in the Portland region, Oregon and the West Coast.

Table 4
High Tech Industry Employment in the Portland Region Compared to all other Industries 2001 to 2004

	2001	2004	Change	% Change
West Coast	16,220,942	16,451,478	230,536	1.4%
Oregon	1,343,430	1,383,822	40,392	3.0%
Portland Region	709,876	696,532	-13,344	-1.9%
High Technology	56,451	45,458	-10,993	-19.5%

Source: Oregon Labor Market Information System Covered Employment and Wages; U.S. Department of Labor Bureau of Labor Statistics

The major cause of job loss in high tech can be explained by major downturns in the national and global high tech industry. Specifically, Semiconductors and related industries are cyclical and are most affected by broader industry and economic trends and have been impacted by the recent slowing of economic growth and the downturn in manufacturing industries over the same period. Another factor explaining the recent downturn in the high tech sector is acquisitions. Two local examples of this include Extensis and Webtrends, both of which could have continued to grow in the city of Portland.

Even with layoffs and job losses in high tech, wages had a moderate increase. From 2001 to 2004 high tech had a wage increase of almost 13%, outpacing the under 5 percent experienced along the West Coast.

Since the Portland region is beginning to see signs of an economic turn around, it may be time to capitalize on its high tech advantage. The availability of a lower cost, highly educated workforce gives Portland an advantage over other metropolitan areas in the US.

The Economic Development Strategy for the City of Portland (2002) identified a number of key issues important to the high tech industry. The following represents a summary of key issues identified by the sector:

- Access to high-quality local talent and superior schools is a major concern of both the manufacturing and services components of high technology in the PMSA.
- Firms in manufacturing are also concerned about the availability of land. The City of Portland lacks the contiguous acreage of industrial land needed to attract a large high technology manufacturer.
- The City also lacks the resident labor force and agglomeration of high tech manufacturing establishments within the City limits.
- The City of Portland would gain more by having direct growth in high technology knowledge-based jobs. Not only are the wages higher than in manufacturing, but the workers for this part of the sector are apt to prefer living in the City – especially those in the creative content fields.

Implementation

The primary goals of strategy implementation are job retention and expansion, wealth creation and business support. The Portland Development Commission plays a support role to high tech target industries by promoting industry initiatives, supplying financial assistance and by participating in business outreach efforts. Throughout the next fiscal year, the PDC will work with its partners in helping to foster a positive business climate for the high tech industry in Portland and throughout the State of Oregon.

The Portland region has a competitive advantage in high tech, with a diverse technology-oriented labor force, a competitive cost structure, strong software-oriented business networks, easy access to the Bay Area and International markets, and an attractive community to relocate managers, with affordable housing and safe neighborhoods. Noting Portland's competitive advantage, along with other factors that affect overall high tech business helps to asses what actions the PDC can undertake to support high tech industries. Below is a listing of factors that the PDC recognizes it can help affect in promoting the high tech industries, along with a list of factors that are more difficult to change.

Types of High tech business factors that the PDC can help affect:

- Business & economic climate
- Financing
- Government Policy
- Industry advocacy
- Industry Networking
- Industry support and coalescence
- Land use issues
- Permitting
- Recruitment
- Retention and expansion of existing high tech businesses
- Workforce development
- Better coordination with institutions of higher learning

Types of High Tech business factors that are difficult to affect:

- Access to markets
- Availability of space
- Competition
- Escalating real estate costs
- Global and national economic conditions
- Physical barriers
- Transportation infrastructure

- Technology transfer
- Off shoring of manufacturing processes

Strategy goals were developed for the high tech strategy in 2002 for the City of Portland to implement. Many of the goals listed were of a supporting nature and the City's future role will continue to be in this manner. Previous strategy goals included:

- Improve the university system
- Increase the capital and technical resources for emerging businesses
- Strengthen the airport
- Increase City involvement and regional cooperation

To date, there has been considerable activity around many aspects of these goals. Regarding the first bullet, PDC was involved with PSU in the establishment of the Portland Business Accelerator, which provides a venue for startups to accelerate technology translation and improve connections between business and university resources. Regarding the second bullet, PDC has increased its funding to emerging businesses considerably in the last few years, with over $1,852,400 given out directly in support of emerging high tech companies. PDC also works with regional and state partners to bring all relevant resources to the table to support business retention, expansion and recruitment, including grants, loans, and tax credits, as well as a host of technical resources. Regarding the third bullet PDC in partnership with Siltronic and other industry leaders created a travel bank which helped to attract direct flights to Germany on Lufthansa airlines. Regarding the fourth bullet, the establishment of the Portland Regional Partners for Business ratified an informal relationship among the economic development practitioners in Portland and surrounding cities that make up the three county metropolitan region. Each of these identified strategies categories requires ongoing support.

Top Issues Facing the High Tech Industry

1) Improved Coordination with University Systems:
    a. Work force development: Alignment of curriculum and workforce development programs with industry needs.
    b. Tech Transfer: Increased coordination with institutions of higher learning on research and development activities.
2) Regulatory Issues: Permitting processes, fees and timelines.
3) Land availability: The availability of large tracts of land for new development.
4) National and global Business and Economic climate: Reducing the need to off shore manufacturing in order to stay competitive.
5) Cost of doing business: State and local tax structure, labor costs, costs of facilities.

Action Items for High Tech

- **Regional Focus**: Work with the Portland Regional Partners for Business and the private sector
    - Co-host networking opportunities for private sector executive leadership to meet with regionally elected public officials.
- **Industry Engagement**:
    - Form a High Tech Advisory Committee to develop and guide overall High Tech industry initiatives.
    - Work with and support existing industry associations within the High Tech Target Industry such as the American Electronics Association – Oregon Chapter, Oregon Display System Industry Consortium, the Open Source Development Lab, SEMI Pacific Northwest, the Society of Information Display, Software Association of Oregon, and the Video Electronics Standards Association.
- **Unwire Portland**: Continue pursuit of a citywide wireless network through the Unwire Portland project. This initiative is attempting to recruit a private company to finance, install, operate and maintain a citywide wireless system for use by government and institutional users, businesses, residents and travelers.

- **Coordination with University System**: Work with institutes of higher learning to:
    - Improve coordination and encourage tech transfer initiatives that will foster additional research in support of startups and existing industry (such as the Innovation Council and the Oregon Nanoscience And Microtechnologies Institute).
    - Strengthen the relationship between the private sector and higher learning institutions.
- **Financing**: Facilitate connections between companies and financing organizations and look for ways to fill gaps in available financing for startups.
- **Workforce Development**: Work with workforce organizations to focus programs and assistance on connecting companies to appropriately qualified workforce.
- **Recruitment and Conferences/Trade Shows**: Sponsor and exhibit at trade shows relevant to the high tech industry including O'Reilly Open Source Conference, August 2005; ADEAC Conference, October 2005; Society of Information Display Conference, June 2006. Update marketing materials for high tech in Portland.

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Appendix A
Top 50 (by revenue) High Tech Companies in Portland

Business Name	Industry
Precision Castparts Corp	Steel Investment Foundries
Tektronix	Instruments To Measure Electricity
Mentor Graphics Corporation	Computer Integrated Systems Design
Infocus Systems	Computer Peripheral Equipment, Nec
FSI	Search and Navigation Equipment
Fei Company	Analytical Instruments
Triquint Semiconductor Inc	Semiconductors and Related Devices
Radisys Corporation	Computer Peripheral Equipment, Nec
Lattice Semiconductor Corp	Semiconductors and Related Devices
Esi	Electrical Equipment and Supplies, Nec
Precision Cast Products	Aircraft Parts and Equipment, Nec
Pixelworks Inc	Semiconductors and Related Devices
Merix Corporation	Printed Circuit Boards
Christenson	Electrical Work
Integrated Systems Group	Electrical Work
Wacker Semicdtr Holdg Corp	Semiconductors and Related Devices
Engineers	Engineering Services
Sentrol Industrial	Electrical Equipment and Supplies, Nec
Digimarc Corporation	Computer Integrated Systems Design
Merant Inc	Prepackaged Software
Cascade Microtech Inc	Instruments To Measure Electricity
Red Wagon Store	Roasted Coffee
Williams Controls Inc	Motor Vehicle Parts and Accessories
Tuality Healthcare	Home Health Care Services
Shinei USA Inc	Electronic Computers
Oeco LLC	Electronic Components, Nec
Corillian Corporation	Prepackaged Software
Timberline Software Corp	Prepackaged Software
Leupold & Stevens	Optical Instruments and Lenses
Harland Financial Solutions	Business Services, Nec
Sumitomo Elc Semicdtr Mtls	Semiconductors and Related Devices
Jae Oregon Inc	Electronic Connectors
Epson Portland Inc	Computer Peripheral Equipment, Nec
Poorman-Douglas Corporation	Computers, Peripherals, and Software
Micro Power Electronics Inc	Electrical Equipment and Supplies, Nec
Maxtek	Semiconductors and Related Devices
Clarity Visual Systems Inc	Radio and T.V. Communications Equipment
Pacific Office Automation Inc	Miscellaneous Retail Stores, Nec
Vernier Software & Tech LLC	Custom Computer Programming Services
Sure Power Industries	Engine Electrical Equipment
Welch Allyn Monitoring	Surgical and Medical Instruments
Tut Systems Inc	Radio and TV Communications Equipment
Webtrends Inc	Prepackaged Software
Micro Systems Engineering Inc	Semiconductors and Related Devices
Northwest Evaluation Assn	Business Consulting, Nec
Associated Business Systems	Office Equipment
Unicru Inc	Prepackaged Software
Intermountain Industrial Sup	Industrial Supplies
Inspiration Software Inc	Custom Computer Programming Services
Everest Consultants Inc	Data Processing and Preparation

Source: Dun & Bradstreet Marketing Solutions, July 2005.

Appendix B
Top 50 (by employment) High Tech Companies in Portland

Business Name	Industry
Mentor Graphics Corporation	Computer Integrated Systems Design
Precision Cast Products	Aircraft Parts and Equipment, Nec
Intel	Process Control Instruments
Intel	Semiconductors and Related Devices
Tektronix	Instruments To Measure Electricity
Stream International Inc	Computer Integrated Systems Design
Mentor Graphics Corporation	Computer Integrated Systems Design
Merix Corporation	Printed Circuit Boards
Oeco LLC	Electronic Components, Nec
Intel	Semiconductors and Related Devices
Tuality Healthcare	Home Health Care Services
ADP	Data Processing and Preparation
Precision Interconnect	Current-carrying Wiring Devices
I D T	Semiconductors and Related Devices
Microchip Technology Inc	Semiconductors and Related Devices
Leupold & Stevens	Optical Instruments and Lenses
Sentrol Industrial	Electrical Equipment and Supplies, Nec
Infocus Systems	Computer Peripheral Equipment, Nec
Fujitsu Computer Pdts of Amer	Computers, Peripherals, and Software
Fei Company	Analytical Instruments
Triquint Semiconductor Inc	Semiconductors and Related Devices
Shinei USA Inc	Electronic Computers
Integrated Systems Group	Electrical Work
Synopsys Inc	Custom Computer Programming Services
Credence Systems Corporation	Instruments To Measure Electricity
Timberline Software Corp	Prepackaged Software
Epson Portland Inc	Computer Peripheral Equipment, Nec
Lockheed Martin	Data Processing and Preparation
Xo Communications Inc	Information Retrieval Services
Esi	Electrical Equipment and Supplies, Nec
Lattice Semiconductor Corp	Semiconductors and Related Devices
Harland Financial Solutions	Business Services, Nec
Wipro Infotech	Prepackaged Software
Micro Systems Engineering Inc	Semiconductors and Related Devices
Welch Allyn Monitoring	Surgical and Medical Instruments
Engineers	Engineering Services
Jae Oregon Inc	Electronic Connectors
Coe Manufacturing Company	Hardwood Veneer and Plywood
Rockwell Collins Flight Dynmc	Search and Navigation Equipment
Johnson Controls	Motor Vehicle Parts and Accessories
Christenson Velagio Inc	Computer Integrated Systems Design
Red Wagon Store	Roasted Coffee
Rockwell Cllins Flght Dynamics	Search and Navigation Equipment
Merant Inc	Prepackaged Software
FSI	Search and Navigation Equipment
Micro Power Electronics Inc	Electrical Equipment and Supplies, Nec
Webtrends Inc	Prepackaged Software
Peco Manufacturing Company	Plastics Products, Nec
Cascade Microtech Inc	Instruments To Measure Electricity
Westak of Oregon Inc	Printed Circuit Boards

Source: Dun & Bradstreet Marketing Solutions, July 2005