

# **MANUFACTURING STILL MATTERS**



Northwest Policy Center  
University of Washington  
Evans School of Public Affairs

September 2002

## INTRODUCTION

Manufacturing is a vital part of the Seattle-King County economy, with over 3,200 firms providing nearly 146,000 jobs. Manufacturing accounts for over 12 percent of the region's employment, and over 14 percent of all wages, indicating it is a significant employer and a high wage industry.\* Manufacturing also generates a significant number of additional jobs in the economy, due to supplier and distribution relationships (or the multiplier effect). It is estimated that every manufacturing job adds another 1.5 to 3 jobs to the regional economy, a rate higher than for most other sectors.

Within manufacturing, the largest sector is transportation equipment, which includes Boeing (commercial aircraft and military/space products), Paccar (large trucks), subcontractors that make parts for one of these two major firms, and a number of ship and boat building and repair firms.

However, there is more to manufacturing in Seattle-King County than airplanes, trucks, and boats. This report—prepared by the Northwest Policy Center at the University of Washington's Evans School of Public Affairs for the Workforce Development Council of Seattle-King County, as part of its Manufacturing Industry Panel—examines the range of manufacturing sectors in Seattle-King County and their relative significance to the regional economy, the utilization of various occupational groups within manufacturing, and the outlook for selected manufacturing occupations. It also explores the challenges and opportunities confronting manufacturers such as skill gaps and training needs; and strategies and approaches for addressing these challenges and opportunities.

## INDUSTRY OVERVIEW

Seattle-King County has a diversified manufacturing base. Transportation equipment is the largest manufacturing sector, with 60,000 jobs or over 40 percent of all manufacturing employment in the region in 2000, as shown in the table on the following page. Other large manufacturing sectors include food products, with 13,600 jobs (equal to 9 percent of all manufacturing employment); printing and publishing, 12,200 jobs (8 percent); industrial machinery and equipment, 9,400 jobs (6 percent); other durable goods, 8,200 jobs (6 percent); electronic and electrical equipment, 7,600 jobs (5 percent); instruments, 7,200 jobs (5 percent); and fabricated metals, 5,600 jobs (4 percent).

Employment in Seattle-King County is expected to expand by an average of 1 percent a year from 2000-2005, ignoring or smoothing out the short term effects of the recession that began in 2001, as shown in the table on the following page. From 2005-2010, a substantially higher growth rate is expected, 1.8 percent a year.

In contrast to these modest growth rates, manufacturing employment is projected to decline by an average of 1.7 percent a year from 2000-2005, primarily due to declines in the transportation equipment sector. All three kinds of transportation equipment—aircraft, ships, and trucks—are expected to shrink in total employment, either due to lower shipment levels or higher productivity. Employment declines are also expected in several other sectors, including stone, clay, and glass; food products; textiles and apparel; paper products; printing and publishing; and petroleum and plastics. Expansion is projected in a number of other sectors, including lumber and wood products, fabricated metals, instruments, other durable goods, and chemicals.

---

\* The Northwest Policy Center's *Northwest Job Gap Study* found over 75 percent of all manufacturing jobs in the state pay a living wage. In addition, over 20 percent of all living wage jobs are in manufacturing.

In the second half of the decade, the picture is more positive, with expansion projected in most manufacturing sectors. Overall, manufacturing employment is projected to expand by an average of 1 percent a year from 2005-2010. Sectors with above average growth rates include industrial machinery and equipment, electronic and electrical equipment, instruments, and petroleum and plastics.

Size and projected growth rates are two criteria for identifying key manufacturing sectors. Other criteria include short term employment trends, regional significance compared to the rest of the country (or location coefficients), and wage rates.

### Seattle-King County Employment by Manufacturing Sector

Sector	Employment 2000	Projected Employment 2005	Projected Employment 2010	Annual Growth Rates	
				2000-05	2005-10
TOTAL	1,189,700	1,250,300	1,363,600	1.0%	1.8%
MANUFACTURING	145,900	133,600	141,400	-1.7%	1.1%
Durable Goods	107,900	96,500	103,800	-2.2%	1.5%
Lumber & Wood Products	5,300	5,500	5,600	0.7%	0.4%
Stone, Clay & Glass	3,500	3,300	3,400	-1.2%	0.6%
Primary Metals	1,100	1,100	1,100	0.0%	0.0%
Fabricated Metals	5,600	5,700	6,200	0.4%	1.7%
Industrial Machinery & Equip	9,400	9,200	10,600	-0.4%	2.9%
Electronic & Electrical Equip	7,600	7,600	8,500	0.0%	2.3%
Transportation Equipment	60,000	48,100	51,100	-4.3%	1.2%
Aircraft & Parts	53,100	42,500	45,100	-4.4%	1.2%
Ship & Boat Building, Repair	2,700	2,200	2,400	-4.0%	1.8%
Other Transportation Equip	4,200	3,400	3,600	-4.1%	1.1%
Instruments & Related	7,200	7,700	8,500	1.4%	2.0%
Other Durable Goods	8,200	8,300	8,800	0.2%	1.2%
Nondurable Goods	38,000	37,100	37,600	-0.5%	0.3%
Food & Kindred Products	13,600	13,500	13,600	-0.1%	0.1%
Textiles, Apparel & Leather	3,800	3,400	3,300	-2.2%	-0.6%
Paper & Allied Products	2,400	2,200	2,200	-1.7%	0.0%
Printing & Publishing	12,200	12,100	12,100	-0.2%	0.0%
Chemicals & Allied Products	2,400	2,600	2,700	1.6%	0.8%
Petroleum, Coal & Plastics	3,600	3,300	3,700	-1.7%	2.3%

Source: Washington Employment Security Department

Short term employment trends show a number of manufacturing sectors growing in recent years, as shown in the table on the following page. These include furniture and fixtures, chemicals, rubber and plastics products, industrial machinery and equipment, electronic and electrical equipment, and instruments.

Location coefficients measure the relative concentration of employment in a sector in a region, compared to the country as a whole. A large location coefficient suggests a sector may have a regional competitive advantage region. Seattle-King County manufacturing sectors with large location coefficients include food products, printing and publishing, transportation equipment, and instruments.

Average annual wages for a sector reflect the occupational distribution in that sector as well as overall wage levels in the region. In addition, the average wage level can be heavily influenced by a small number of very

high wage occupations in a sector. As a result, this measure must be interpreted carefully. However, comparing average wage levels to Seattle-King County per capita income—\$45,536 in 2000—gives some idea of how well off workers are in particular sectors. Manufacturing sectors with average annual wages exceeding per capita income are lumber and wood products, chemicals, petroleum products, industrial machinery and equipment, electronic and electrical equipment, transportation equipment, instruments, and miscellaneous manufactured products.

### Significance of Manufacturing Sectors in Seattle King County

Sector	Employment				Location Coefficient	Average Annual Wage
	1997	1998	1999	2000		
Food & Kindred Products	15,237	14,007	13,400	13,455	1.57	\$41,580
Textile Mill Products	232	220	211	193	0.07	\$27,025
Apparel & Other Textile Products	3,802	3,787	3,443	3,336	1.04	\$25,442
Lumber & Wood Products	5,842	5,508	5,303	5,306	1.27	\$59,945
Furniture & Fixtures	1,842	2,390	2,130	2,425	0.86	\$30,347
Paper & Allied Products	2,334	2,579	2,520	2,385	0.72	\$41,119
Printing & Publishing	11,632	11,305	11,765	11,871	1.52	\$40,985
Chemicals & Allied Products	2,174	2,199	2,266	2,377	0.46	*
Petroleum & Coal Products	*	*	*	*	*	*
Rubber & Misc. Plastics Products	2,750	2,686	3,819	3,452	0.67	*
Leather & Leather Products	221	211	129	*	*	*
Stone, Clay & Glass Products	3,756	3,836	3,135	3,440	1.18	\$39,635
Primary Metal Industries	1,136	1,172	1,175	1,108	0.31	\$44,762
Fabricated Metal Products	5,728	5,902	5,434	5,462	0.70	\$36,650
Industrial Machinery & Equipment	8,263	8,683	9,024	9,250	0.87	\$54,266
Electronic & Electrical Equipment	7,143	7,733	7,521	7,500	0.87	\$48,025
Transportation Equipment	69,620	74,502	67,411	59,897	6.39	*
Motor Vehicles & Equipment	3,135	3,682	4,079	3,194	0.62	\$53,481
Aircraft & Parts	*	*	*	*	*	*
Ship & Boat Building, Repair	2,791	2,648	2,609	2,668	3.12	\$41,393
Instruments & Related Products	6,304	6,981	7,003	7,218	1.69	\$60,566
Misc. Manufacturing	5,382	5,666	5,713	5,582	2.82	\$45,806

Source: U.S. Department of Labor and Washington Employment Security Department

Key manufacturing sectors in Seattle-King County—based on size, projected growth rates, short term employment trends, regional significance, and wage rates—include:

- Industrial machinery and equipment
- Electronic and electrical equipment
- Instruments
- Transportation equipment
- Fabricated metal products

These sectors will generate a large portion of all manufacturing job openings, counting both those due to growth and replacement needs as workers retire or move on to other jobs.

Production jobs make up the largest single portion of all manufacturing employment—over 53,000 jobs out of about 156,000, or 34 percent, as shown in the table on the following page. The next largest occupational groups are office and administrative (14 percent), engineering (13 percent), computer related (10 percent),

business and financial operations (8 percent), transportation and material moving (8 percent), and installation, maintenance and repair (5 percent).

**Seattle-King County Manufacturing Employment by Major Occupational Group, 2000**

Occupational Group	Estimated Employment
Production	53,216
Office & Administrative	21,657
Architecture & Engineering	20,478
Computer & Mathematical	15,489
Business & Financial Operations	12,255
Transportation & Material Moving	11,989
Installation, Maintenance & Repair	8,060
Sales and Related	6,229
Arts, Design, Entertainment, Sports & Media	2,863
Construction & Extraction	1,629
Building & Grounds Cleaning & Maintenance	614
Life, Physical & Social Science	555
Protective Service	429
Food Preparation & Serving Related	333
Legal	92
Education, Training & Library	11
<b>Total</b>	<b>155,899</b>

Source: Washington Employment Security Department

Among the largest occupations in manufacturing, as shown in the table below, are engineers, assemblers, computer systems analysts, clerks, machine operators, engineering technicians, inspectors/testers, machinists, sales representatives, secretaries, maintenance and repair workers, and truck drivers. Some occupations such as aerospace engineers are tied to a specific manufacturing sector; others such as maintenance and repair workers are found in most sectors.

**Top 40 Manufacturing Occupations in Seattle-King County, 2000**

Occupation	Employment
Aerospace Engineers	7,618
Computer Systems Analysts	6,477
Team Assemblers	4,801
Shipping, Receiving & Traffic Clerks	4,717
Aircraft Structure, Surfaces, Rigging and Systems Assemblers	4,346
Electrical & Electronic Equipment Assemblers	3,940
First Line Supervisors/Managers, Production & Operating Workers	3,653
All Other Engineers	2,890
Inspectors, Testers, Sorters, Samplers and Weighers	2,357
Machinists	2,352
Sales Representatives, Wholesale & Manufacturing	2,329
Executive Secretaries and Administrative Assistants	2,321
Engineering Managers	2,249
General Office Clerks	2,067
General & Operations Managers	2,016
Hand Packers & Packagers	1,995

---

Customer Service Representatives	1,824
Aerospace Engineering & Operations Technicians	1,804
General Maintenance & Repair Workers	1,705
Truck Drivers, Heavy & Tractor Trailer	1,692
Accountants & Auditors	1,644
Production, Planning & Expediting Clerks	1,581
Printing Machine Operators	1,552
Cost Estimators	1,540
Computer Support Specialists	1,426
Bookkeeping, Accounting & Auditing Clerks	1,396
Laborers & Freight, Stock & Material Movers, Hand	1,343
Industrial Production Managers	1,284
Other Business Operations Specialists	1,278
Welders, Cutters, Solderers & Brazers	1,245
Electrical and Electronic Engineering Technicians	1,232
Mechanical Engineers	1,215
Computer & Information Systems Managers	1,200
Cutting, Punching & Press Machine Setters, Operators, & Tenders, Metal & Plastic	1,131
Sewing Machine Operators	1,105
Purchasing Agents	1,096
Network & Computer Systems Administrators	1,090
Industrial Engineers	1,074
Order Clerks	1,028
Tool & Die Makers	889

---

*Source:* Washington Employment Security Department

The largest manufacturing occupations are projected to generate thousands of job openings in the region in the years ahead, as shown in the table on the following page. (Job openings are reported for all sectors, not just manufacturing.) Some job openings will result from growth; others from the need to replace workers as they retire or move on to other jobs.

Almost all of the occupations pay a living wage. And they require varying amounts of education and training, from little to long term education and training.

Key manufacturing occupations—based on employment, projected job openings, and wages—include:

- Engineers and engineering technicians
- Computer related such as computer systems analysts, network administrators, and computer support specialists
- Sales representatives
- Purchasing agents
- Clerks such as general office clerks, shipping, receiving and traffic clerks, and production, planning and expediting clerks
- Maintenance and repair workers
- Assemblers such as team assemblers and electrical and electronic equipment assemblers
- Inspectors, testers, sorters, samplers, and weighers
- Machine operators
- Machinists
- Welders
- Truck drivers

## Manufacturing Occupations by Job Openings, Wages, & Education & Training

Occupation	Annual Job Openings* (Growth & Replacement)		Median Wage**	Ed & Training***
	2000-05	2005-10		
Sales Representatives, Wholesale & Manufacturing	816	1,119	\$23.70	Short term
General Office Clerks	844	1,074	\$14.70	Little
Laborers & Freight, Stock & Material Movers, Hand	778	703	\$12.30	Little
Bookkeeping, Accounting & Auditing Clerks	477	658	\$14.60	Short term
All Other Business Operations Specialists	439	629	\$27.10	Long term
Accountants & Auditors	386	563	\$21.60	Long term
Customer Service Representatives	298	515	\$13.90	Short term
General & Operations Managers	321	507	\$43.90	Long term
Executive Secretaries & Administrative Assistants	274	462	\$18.10	Short term
General Maintenance & Repair Workers	215	376	\$19.70	Short term
Hand Packers & Packagers	297	365	\$9.80	Little
Truck Drivers, Heavy & Tractor Trailer	197	354	\$18.90	Short term
Shipping, Receiving & Traffic Clerks	162	346	\$16.10	Little
Computer Systems Analysts	0	309	\$31.90	Long term
Computer Support Specialists	159	304	\$22.40	Moderate
Team Assemblers	78	250	\$11.50	Short term
Electrical & Electronic Equipment Assemblers	94	244	\$10.40	Little
All Other Engineers	79	222	\$31.60	Long term
Computer & Information Systems Managers	120	212	\$41.90	Long term
Aerospace Engineers	0	203	\$37.70	Long term
First Line Supervisors/Managers, Production & Operating	102	193	\$22.80	Short term
Order Clerks	128	188	\$13.10	Little
Engineering Managers	55	166	\$42.80	Long term
Network & Computer Systems Administrators	73	149	\$28.30	Long term
Electrical & Electronic Engineering Technicians	62	131	\$20.40	Moderate
Inspectors, Testers, Sorters, Samplers & Weighers	48	116	\$16.50	Short term
Production, Planning & Expediting Clerks	45	114	\$19.10	Little
Welders, Cutters, Solderers, & Brazers	49	113	\$16.10	Moderate
Cost Estimators	23	109	\$24.60	Long term
Purchasing Agents	56	107	\$19.80	Long term
Machinists	17	93	\$19.30	Short term
Aircraft Structure, Surfaces, Rigging & Systems Assemblers	0	89	\$22.70	Short term
Mechanical Engineers	42	89	\$27.00	Long term
Cutting, Punching & Press Machine Setters, Operators & Tenders, Metal & Plastic	19	68	\$12.30	Short term
Industrial Production Managers	17	63	\$34.00	Long term
Industrial Engineers	9	52	\$29.80	Long term
Printing Machine Operators	41	51	\$16.10	Short term
Aerospace Engineering & Operations Technicians	0	35	\$26.70	Moderate
Tool & Die Makers	0	22	\$23.70	Short term
Sewing Machine Operators	0	16	\$8.40	Short term

Source: Washington Employment Security Department

\* Job openings are for all sectors, not just manufacturing

\*\* Manufacturing sector wages are for the Seattle-Bellevue-Everett MSA

\*\*\* Education and training categories are little (less than a month of on the job training), short term (up to a year of on the job, employer provided, and/or community and technical college training), moderate (anywhere from more than a year to less than four years of education and training, including on the job, employer provided, college, and apprenticeship training), and long term (a four year bachelor's degree or more).

## CHALLENGES & OPPORTUNITIES

Seattle-King County manufacturers, interviewed as part of the Workforce Development Council of Seattle-King County's Manufacturing Industry Panel project, report a number of workforce development challenges. These include:

- *Skill gaps.* Seattle-King County manufacturers report difficulty finding qualified applicants for available job openings, particularly for skilled occupations such as fabricators and welders. They report a need for workers with the following skills:
  - basic skills such as reading, writing, and math;
  - workplace skills, including work ethic, adaptability, flexibility, team work, and communication skills; and
  - basic manufacturing skills such as machining and welding.

The Washington Workforce Training and Education Coordinating Board's 2001 employer survey found that over 60 percent of Seattle-King County manufacturers that had looked to hire new workers over the preceding 12 months reported having difficulty finding qualified applicants. Of those manufacturers reporting difficulty finding qualified applicants, the largest percentage had difficulty finding those with job specific skills. As shown in the table below, 47 percent reported much difficulty finding qualified applicants with job specific skills; another 51 percent reported some difficulty.

In terms of education levels, the WTECB survey found that area manufacturers had the most difficulty finding workers with vocational certificates and degrees.

**Seattle-King County Manufacturers' Difficulty Finding Qualified Job Applicants**

Skill	Much Difficulty	Some Difficulty	No Difficulty
<b>Basic Skills</b>			
Reading	4%	36%	59%
Writing	1%	48%	49%
Math	8%	41%	49%
Computer	0%	43%	56%
<b>Workplace Skills</b>			
Teamwork	9%	58%	32%
Problem solving/critical thinking	19%	76%	4%
Communication	8%	83%	7%
Positive work habits	25%	55%	18%
Ability to adapt to change	16%	67%	16%
Job specific skills	47%	51%	1%

Source: Washington Workforce Training and Education Coordinating Board



Manufacturers also report skill gaps among their current workers; these include English proficiency, workplace skills such as teamwork and leadership skills, supervisory skills, and knowledge and understanding of advanced manufacturing and improvement processes.

- *Training needs.* Seattle-King County manufacturers—particularly small and medium sized manufacturers—report a need for workforce education and training that provides participants the skills they require: basic skills, workplace skills, and basic manufacturing skills. The focus, according to manufacturers, needs to be on skills and competencies, not one and two year certificates and degrees. They also report a need for upgrade training once workers are on the job. In addition, training needs to be offered at convenient times and locations.

However, manufacturers report a number of issues and concerns with the workforce development capacity of community and technical colleges. These include:

- Employers are not viewed as customers.
  - There is a lack of clearly specified outcomes and measurable, tangible results.
  - Instructors are discouraged from working in the community and with employers by community and technical college systems that are more internally focused; another issue is turnover.
  - Incentives work against providing employers the training they need (e.g., funding formulas and reimbursement rates).
  - Territoriality exists among community and technical colleges, which results in competition rather than collaboration.
  - Pre-packaged training that serves the greatest number is preferred; however, employers as well as training participants have different needs, so training needs to be structured and designed to meet these needs.
- *Difficulty navigating the workforce development system.* Seattle-King County manufacturers also report difficulty accessing or interacting with the workforce development system. Those who have had contact or experience with the system report difficulty interacting with it. And those who have not report they lack information about the system and its programs and services.

Small and medium sized manufacturers place a high value on having a source of work-ready employees, and the pre-screening and assessment of job applicants.

## **WORKFORCE DEVELOPMENT STRATEGIES**

Priority strategies for addressing the manufacturing sector's workforce development challenges, as recommended by the Workforce Development Council of Seattle-King County's Manufacturing Industry Panel, include:

- *Create a regional training consortium for manufacturing.*

Individually, small and medium sized manufacturers lack the scale to get the skills training they need. One solution is to create a regional consortium that brings together manufacturers to address their common workforce, training, and related needs.

A regional training consortium would:

- provide a venue for manufacturers to impact community and technical college workforce education and training programs;
- aggregate demand for training so the needs of small and medium sized manufacturers are addressed; and
- promote policies and practices—including institutional incentives—aimed at making community and technical colleges more responsive to industry needs.

Manufacturers in other areas of the country have created regional training consortia. For example, the Wisconsin Regional Training Partnership brings together over 40 manufacturing firms in the Milwaukee area. Governed by a tripartite board made up of business, labor, and government representatives, the partnership pursues modularized, skill standards based training that can be used for hiring and advancement throughout all member firms.

- *Develop a single point of contact for manufacturers.*

Manufacturers report it is not easy to access or interact with the workforce development system, as noted above. One solution is to create a single point of contact through which manufacturers and other employers can access current, comprehensive, and “employer centric” information about workforce development programs and services. Options include:

- a comprehensive internet based training inventory that provides manufacturers and other employers current and easily accessible information on available workforce education and training programs; and/or
- staff with in-depth knowledge and understanding of the industry as well as the workforce development system that serve as sector specific brokers of employment and training services for employers.

- *Develop skill assessment centers.*

Manufacturers report a gap between the workforce education and training they and their workers need, and the performance of community and technical colleges in providing such education and training, as noted above. To close this gap, community and technical colleges report they need more detailed information on jobs and skill requirements.

One solution is to develop a skill assessment center that works with manufacturers to profile their jobs, and the skills and level of skills required; and translates this into training, certification, and screening.

One element of this is to increase awareness and use of industry skill standards. Currently, few manufacturers in the region use or are aware of manufacturing industry skill standards. Use of skill standards by the area’s community and technical colleges is also limited.

Another element is to develop modularized training, based on skill assessments and standards. Manufacturers, as noted above, are more interested in skills and competencies than one and two year certificates and degrees. Modularized, competency based training makes it possible for

manufacturers and other employers as well as workers to pick and choose the skills training they need—a la carte—and not be tied to community and technical colleges' regular academic schedule.

Examples of innovative community and technical college programs include:

- Macomb Community College (Warren, Michigan) has an industrial network that helps small and medium sized manufacturers meet their workforce training needs. The network offers courses in quality, manufacturing, and design principles; leadership training, industry specific technical seminars and workshops, and customized, on site advancement training.
- Central Piedmont Community College (Charlotte, North Carolina) offers modularized, semester long training programs that result in certificates tied to industry standards. Employer partners guarantee graduates a job interview.
- Sinclair Community College (Dayton, Ohio) certifies that students completing its manufacturing training programs meet industry skill standards; in turn, local manufacturers commit to give them first consideration in hiring.

Other strategies include:

- *Expand the capacity of vocational ESL programs at convenient times and locations.*

Manufacturers report a growing need for vocational English as a Second Language instruction. Limited English proficiency is one barrier to advancement. Vocational ESL instruction needs to be offered at convenient times and locations.

- *Create a manufacturing “boot camp.”*

Manufacturers report a need for workers with basic, fundamental skills. One approach is an intensive training program that provides basic employability skills, along with basic manufacturing skills.

- *Advocate for increased incentives for community and technical colleges to better respond to industry training needs.*

There is currently a lack of incentives for community and technical colleges to work with industry. In fact, there are some disincentives, including funding formulas, which cover only credit bearing courses; and reimbursement rates, which fail to take into account the higher cost of workforce training.

One solution is for manufacturers and other employers to advocate for incentives that promote community and technical college workforce training geared to the needs of employers, especially small and medium sized firms.

- *Develop internship programs with community and technical colleges.*

Manufacturers note work and learning need to be better integrated, both in the classroom and the workplace. Internships are one way to provide students work based learning opportunities.

- *Increase the capacity and effectiveness of high school vocational technical education and training.*

Manufacturers report entry level workers lack basic employability skills and basic manufacturing skills. They note more needs to be done at the K-12 level.

Possible approaches include:

- a technical high school that focuses on providing students vocational technical education and training;
  - articulation agreements that make it possible for high school students taking vocational technical courses to get a "running start" on related community college programs;
  - a skills center that provides area high school students vocational technical education and training; and
  - manufacturing basics in high school.
- *Increase guidance counselors' familiarity with workforce education, training, and employment opportunities.*

Manufacturers report a need for better vocational counseling. One approach is to increase guidance counselors' familiarity with workforce education and training, and related employment opportunities and career pathways.

- *Advocate for increased public incentives for workforce training.*

Possibilities include tax incentives for employers to provide workers training and/or release time to skilled workers so they can train others.

## **Workforce Development Council of Seattle-King County's Manufacturing Industry Panel**

### **Manufacturing Industry Panel Members**

Gordy Anderson, Genie Industries

Ross Bogue, The Boeing Company

Karen Borgnes, Pacific Aero Tech, Inc.

Harry Franzheim, Mikron Industries

Pam Gibbons, Exotic Metals Forming Company

Steve Pollard, Machinists, Inc.

James Rollins, Red Dot Corp.

Terry Seaman, Seidelhuber Iron & Bronze Works

Robb Stilnovich, Kistler-Morse

### **Staff**

Barbara Ivanov, Kent Chamber of Commerce

Cas Cogswell, Workforce Development Council of Seattle-King County