



Advanced Manufacturing Cluster Inventory Phase

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Inventory Phase

I. Introduction

A Five Year Strategy for Economic Growth & Job Creation

In July 2009, Portland City Council approved the city's Economic Development Strategy, a five-year plan to guide Portland's economic growth and direct the investment necessary to complete the transformation of Portland's economy. The goal of this strategy is to build the most sustainable economy in the U.S. and, in the process, create 10,000 new jobs.

As the city's economic development agency, the Portland Development Commission (PDC) supports the business community and encourages job creation by focusing on key industry clusters of pivotal importance to the city's current and future economy. Portland's industry clusters include Activewear, Advanced Manufacturing, Clean Tech and Software.

Targeted Clusters

An industry cluster is a geographic concentration of a group of interconnected businesses, suppliers and associated institutions in a particular field. Companies that locate in a cluster benefit from a skilled labor force, increased innovation, coordinated advocacy efforts, high-quality supply chains and knowledge spillover. Clusters are considered to increase the productivity with which companies can compete nationally and globally. The clusters targeted by PDC are part of the traded sector, meaning that they sell to markets outside the region and bring new money back into the community.

II. Manufacturing – Importance to U.S. and Oregon Economies

Manufacturing is crucial to the creation and retention of good jobs and a good standard of living for working families. In both larger cities and smaller communities, manufacturing offers powerful economic benefits. Manufacturing is the cornerstone of the U.S. economy - accounting for 12% of the economy. It is also the cornerstone of every leading economy in the world. According to the World Bank, the United States produced more than 19 percent of global manufacturing in 2008 although it contains less than 5 percent of the world's population.

The United States is the world’s largest producer of manufactured products, producing 18 percent more than the second largest producer - China—a country with a population that is four times greater than that of the United States. U.S. manufacturing production is helping to lead economic recovery. ¹

The majority of Advanced Manufacturing companies are traded sector firms. They sell a high percentage of what they produce outside of their respective regions and bring revenues from those sales back to their regions. Manufacturing also has a higher multiplier impact than other sectors of the economy. According to the National Association of Manufacturing, for each \$1 produced in manufacturing, another \$1.43 is created in other sectors of the local economy, twice the \$.71 multiplier for services.²

Manufacturing is very important to the Oregon economy as it ranks 5th in the U.S. by manufacturing’s percentage of the state’s GDP. The manufacturing GDP for the state was \$30.2 billion in 2008 ³ - accounting for 18.7% of Oregon’s economy.

Manufacturing Industry Top States by Percentage of State Economy 2008

Rank	State	Manufacturing GDP	State Percentage
1	Indiana	\$63.8	25.0%
2	Iowa	\$28.2	20.8%
3	Wisconsin	\$48.9	20.3%
4	North Carolina	\$78	19.5%
5	Oregon	\$30.2	18.7%
6	Kentucky	\$28.8	18.4%
7	Louisiana	\$40.5	18.2%
8	Ohio	\$84.1	17.8%
9	Arkansas	\$17.1	17.4%
10	Alabama	\$29.3	17.2%

III. Inventory Phase of Cluster Development

Inventory of Firms, Organizations and Institutions

¹ <http://www.ustr.gov/about-us/press-office/blog/2010/july/weekly-trade-spotlight-americas-manufacturing-sector>

² http://www.workingforamerica.org/toolkit/economic_overview.asp

³ <http://econpost.com/industry/manufacturing-industry-top-states-percentage-state-economy>

The inventory phase of the Advanced Manufacturing Cluster development process began by first generating listings of manufacturing firms located in Multnomah, Washington and Clackamas counties. The next step involved determining which sectors among the region's broad manufacturing sectors actually comprise the Advanced Manufacturing Cluster based on a predetermined set of criteria which included regional representation, traded sector competitiveness, industry-wide growth, and average pay, etc. The sectors identified included metals and transportation equipment; medical equipment and devices; and electronic and communications equipment, devices and instruments. Following closer scrutiny and after receiving feedback from knowledgeable internal and external stakeholders, the focus narrowed exclusively to metals and transportation equipment with the understanding that flexibility would be necessary to incorporate catalytic firms from other sectors where appropriate.

Definition of Portland's Advanced Manufacturing

Portland's Advanced Manufacturing Cluster is driven primarily by businesses involved with metals and transportation equipment that utilize high technology tools, including engineering and computing, for the purpose of producing a product or part, or for enhancing manufacturing capabilities. Advanced Manufacturing technology is used in all areas of manufacturing, including design, fabrication and assembly.

In 2009, over 30,900 workers were employed in the Advanced Manufacturing cluster in the tri-county area. The average annual salary for the cluster is an impressive \$55,288 approximately 30% above the regional average salary of \$43,300.⁴

Advanced Manufacturing - 2006 – 2009 Tri-County Employment

NAICS	Industry	2007	2008	2009	Average Pay 2009
331	Primary Metal Manufacturing	6,600	7,100	5,800	\$59,461
332	Fabricated Metal Product Manufacturing	13,300	13,400	11,000	\$43,526
333	Machinery Manufacturing	8,600	8,300	7,100	\$55,182
336	Transportation Equipment Manufacturing	9,000	8,600	7,000	\$50,985

⁴ Oregon Employment Department
Last Updated: 11/23/10

Advanced Manufacturing - 2009 Statewide Employment, Payroll, and Average Wage

NAICS	Industry	Employment	Payroll	Average Pay 2009
331	Primary Metal Manufacturing	8,113	\$482,410,537	\$59,461
332	Fabricated Metal Product Manufacturing	13,971	\$608,105,911	\$43,526
333	Machinery Manufacturing	9,727	\$536,755,738	\$55,182
336	Transportation Equipment Manufacturing	9,960	\$507,811,428	\$50,985
	Total for these four NAICS:	41,771	\$2,135,083,614	\$51,114

Interviews with Stakeholders

To obtain broad-ranging, independent perspectives about the cluster, PDC Staff conducted a series of individual interviews with key representatives of manufacturing companies and stakeholder organizations that work closely with the cluster. These interviews yielded useful and actionable feedback that has broadened staff understanding of the cluster and that will guide the direction of PDC involvement with the industry in the future. The individuals interviewed for this phase of the cluster development process are among the major leaders, innovators and trendsetters within the cluster - and were chosen specifically for this reason. When asked about others who should be included in interviews, they tended to name each other which is another indication that we had the correct group. The following individuals participated in interviews:

- 1) Heather Ficht, Manager and Jesse Aronson, Sr. Project Manager, Worksystems Inc.
- 2) Brice Barrett, Executive Director, Pacific Northwest Defense Coalition
- 3) Pat Murphy, Executive Director, Oregon Manufacturing Extension Partnership
- 4) Alan Sprott, Vice President, Vigor Industrial
- 5) Chandra Brown, President, United Streetcar
- 6) Eileen Drake, Vice President, PCC Structural; Board of Directors, Manufacturing 21

Issues and Organizing Principles

Based on feedback received from key stakeholders, PDC concluded that the primary issues confronting the Advanced Manufacturing cluster include: shortages in available workforce; limited access to research and development funding; need for improved transportation infrastructure in the region; regional enhancement of the industry supply chain; advocacy and action relative to political and regulatory issues; assistance with

developing certifications and in pursuing business improvement methodologies; and finally, a serious lack of industrial land in the region. Of these, there appeared to be consensus that workforce availability and research and development remain the predominant issues confronting the industry.

Need for Organization

The stakeholders interviewed were unanimous in expressing the need for a new, existing or blended organization that represents manufacturers in this region that can contribute to workforce development, research and development, innovation, supply chain enhancement, and certifications and business improvement methodologies. Alan Sprott of Vigor stated that an organization that bridges the gap between, for example, the Working Waterfront Coalition (WWC) and the Pacific Northwest Defense Coalition (PNDC) is necessary and would be ideal for the regional Advanced Manufacturing industry. Brice Barrett of PNDC was less familiar with WWC, but indicated that there is strong need to have broad-based industry representation. He felt that PNDC was being relied upon too heavily to act as the voice for the manufacturing industry by both media and local government. Eileen Drake of PCC Structural noted that Associated Oregon Industries, Portland Business Alliance, and the Oregon Business Consortium are all key organizations that support manufacturing, but went on to say that these organizations are too broad to effectively address specific manufacturing needs. She believed that an entity like Manufacturing 21 could fill this role.

IV. Summary of Observations from Key Industry Representatives

Uniqueness of Regional Advanced Manufacturing Cluster

As part of the information gathering process for the Inventory Phase for the Advanced Manufacturing Cluster, a review of the newly formed Center for Advanced Manufacturing in the Puget Sound (CAMPS) was conducted to ascertain what Portland might learn from CAMPS' respective experience, knowledge and processes. A number of the issues impacting Puget Sound manufacturers are also major issues for Portland manufacturers, such as workforce shortages, improved innovation, and the desire to enhance their regional supply chain. But one issue in particular that stands out as a major concern to a large number of the 3,000 manufacturers in the Puget Sound region, is of less concern to manufacturers in the Portland region. This issue has to do with international competition - particularly from China. The reason this is not a major issue for a large proportion of our Advanced Manufacturing firms is because this region's Advanced Manufacturing firms have developed niches that have, in some ways, insulated them from certain off-shore competition.

1. This region's manufacturers produce a) machinery that is engineered for specific tasks, b) highly engineered metal products and components of varying sizes, and c) unique metal alloys for specific applications.
2. Regional manufacturers have incorporated lean processes into their production which has improved quality and increased efficiencies. This has led to reduced production costs and faster turn-around times. They can fill customer's orders in days. Turn-around time for orders from off-shore can be weeks or months.
3. Some produce specialized items that are in some cases, too large for off-shore competition to effectively compete with in quality, price and turn-around time such as rail cars, barges, street cars, and even larger infrastructure items for bridges, dams and oilrigs.
4. An impressive number of Portland region Advanced Manufacturing companies are in the top 1% - 5% of their respective industries.

As a prime example, PCC Structural is one of the only producers, worldwide, of special blades for jet engines. Lacking competitors to measure proficiency improvements in manufacturing, they are forced to measure their proficiency improvements against their previous performances. PCC Structural is the primary supplier of jet engine blades to the more than 100 engine manufacturers located throughout the world. Some of their customers include world renowned companies such as Rolls-Royce, Pratt & Whitney, GE and Westinghouse.

Comprehensive Pre-Selection Process for Infrastructure Projects

An issue that has surfaced involves a concern about the procurement of materials and labor on major public infrastructure projects. The concern is that, under the public bidding process, too often contracts go to manufacturers, suppliers or contractors that lack the basic experience and skills to get the job done right, which often leads to cost overruns, excessive change orders, and generally inferior quality work. A way to address this would be to look at ways to pre-qualify eligible bidders up front using criteria designed to ensure they have the necessary experience and qualifications for the job.

Defunding of Machine Programs in Schools

All of the stakeholders were concerned with the diminished funding for technical and trade schools that has resulted in the cancellation of machine shop programs which previously had nurtured student interest in manufacturing careers. Considering the unique competitiveness of our Advanced Manufacturing Cluster and

the economic impact that it has on this community today and in the future, stakeholders find it imperative that we do more to once again fund these programs, and maintain a steady pipeline of knowledgeable, interested, career-minded students coming from the region's school system.

V. Next Steps

Following are the next steps in the Advanced Manufacturing Inventory Phase of the Cluster Development Process:

1. Review and refine the draft listing of Advanced Manufacturing companies, verify all contact and pertinent information on each of the businesses.
2. Identify an appropriate person to facilitate and help guide the Convene phase of the cluster development process.
3. Begin process of identifying representatives of manufacturing businesses that can articulate issues confronting manufacturers in the region as well as contribute to discussions aimed at identifying solutions.

Expectations of Convene Phase

The Inventory Phase of the cluster development process enabled a close review of leading firms, key stakeholders and the opportunity to identify and list the top organizing principles for the industry. The Convene Phase is expected to confirm some of the assumptions that were generated during the Inventory Phase and help in shaping a more focused direction by identifying cluster needs, opportunities and obstacles. The small group meetings conducted during the Convene Phase will provide an opportunity to both catalogue and examine comments in more detail.