



REGIONAL EMPLOYMENT BOARD  
OF HAMPDEN COUNTY, INC.

## **Precision Manufacturing Regional Alliance Project (PMRAP)**

### **Center for Advanced Precision Manufacturing Technology (CAPMT)**

#### **Update on the Feasibility Study**

## Introduction

The Precision Manufacturing Regional Alliance Project (PMRAP) project is conducting a feasibility study on the development of a **Center for Advanced Precision Manufacturing Technology (CAPTM)**. The study is being guided by the following industry-driven strategic objectives:

1. Insure that the following categories of need, as identified by the precision machining companies can be responded to in designing and implementing the Center's functional framework:
  - New Technology Development
  - Shared Engineering Services
  - Skilled Labor pipeline
  - Marketing and New Business Development
2. Increase sector communication, coherence, and commitment to collaborate to develop a broad consensus on the final functional elements of the Center.
3. Leverage the research capabilities from a broad range of regional and national educational institutions to insure that the sector's needs can be addressed in a comprehensive manner.
4. Insure that the marketing and workforce development needs of the sector, as identified in the company questionnaire, are included in the final design of the Center.

This **Update on the Feasibility Study** summarizes the work tasks in this specific project deliverable from **January 2, 2009- June 12, 2009**.

June 18, 2009



REGIONAL EMPLOYMENT BOARD  
OF HAMPDEN COUNTY, INC.

## **Precision Manufacturing Regional Alliance Project (PMRAP)**

### **Center for Advanced Precision Manufacturing Technology (CAPMT)**

#### **Update on the Feasibility Study**

##### **I. Precision Machining: An Industry within the Precision Manufacturing Sector**

The Pioneer Valley Region's precision machining cluster has a primary focus on the machining of metals products, and is part of a larger precision manufacturing sector that includes the precision manufacturing of products for the plastics, paper and electronics industries.

The Precision Manufacturing Regional Alliance Project (PMRAP) project will focus on the precision machining sector. The innovation, technology development, work products and lessons learned from the project will be transferred to and shared with the companies in the larger precision manufacturing cluster. The proposed Center for Advanced Precision Manufacturing Technology will be structured to respond to the needs of the precision machining sector as a 'core' requirement. The broader precision manufacturing cluster will be a desired target and part of the Center's conceptual tradeoff.

##### **II. Definition of Precision Machining**

Precision machining refers specifically to making parts and components to very tight tolerances and high surface finishes using innovative operations and processes. These requirements are maintained for a wide range of geometries, materials and applications. Precision machining requires high performance in areas such as: 1) machine geometry and construction, 2) motion control, 3) thermal and environmental control, 4) tooling selection and application, 6) machining strategy, and 7) real-time performance monitoring and correction.

##### **III. Description of the Precision Machining Cluster**

The high technology precision machining companies in the Region, led by the Western Massachusetts Chapter of the National Tooling and Machining Association (WMNTMA), are contract manufacturers that are primarily engaged in supplying precision mechanical components and sub-assemblies to major commercial manufacturers, aircraft engine builders, and military equipment contractors in the United States and internationally. The companies perform value-added precision manufacturing processes and operations utilizing high technology equipment and world class technology development. In calendar year 2008, the regular members of the WMNTNA experienced the following growth in employment levels and estimated gross sales:

**Estimated Gross Sales of Regular Member Companies: Adjusted for Changes in Company Membership in WMNTMA**

Year	No. of Companies	No. of Employees	Estimated Gross Sales
2005	24	899	\$108 Million
2006	29	993	\$155 Million
2007	33	1281	\$229 Million
2008	39	1386	\$252 Million
Change '07-'08	(+) 6	(+) 105 (8.2%)	(+) \$23 Million (10%)
Change '05-'08	(+) 15	(+) 487 (54.2%)	(+) \$144 Million (133%)

The dollar added value per employee was \$181,818, which is 6.1% higher than the last reported (2006) state-wide average of \$171,358. In addition, the sectors multiplier effect (4.0) generates comparable growth within their supplier and support network. This level of productivity was achieved with an 8.2% increase in the number of employees, and affirms the sectors commitment to investment in new equipment, and implementation of lean manufacturing processes.

**IV. The Strategic Organizing Principles**

The high technology precision machining companies have adopted the following strategic organizing principles that they believe will result in job retention, wealth creation, job growth, and continued economic development in the Region and in the State. These organizing principles will continue to be an important part of the strategic thinking for the development of the CAPMT:

- Record growth in their principal market areas of aerospace and defense has created a new-found confidence in the members' perception of their global competitiveness, and has provided the impetus for long-term investment decisions.
- The companies must continue to develop new partnerships, embrace new technologies and business models, seek out new markets, and build a more responsive and integrated training infrastructure that can respond to the technical skills needed by our new technology and insure the availability and sustainability of a qualified and appropriately sized workforce.
- Their ability to respond to surges in demand in their present markets, and their capacity for product and market diversification and expansion are directly tied to their access to new technology and their ability to provide applications engineering support that will reduce cost, improve lead time and enhance the quality of their parts and components.
- Transparency, sharing of new technology and operational strategies will benefit individual member companies and the precision machining cluster as a whole.
- The companies need to remain agile.

**VI. Feasibility Study- Center for Advanced Precision Manufacturing Technology (CAPMT)**

Phase 1 of the CAPMT feasibility study provided the precision machining companies the opportunity to input into the development of the initial framework of the proposed Center. The following process allowed the companies to incrementally review and analyze the development of the initial framework of the CAPMT:

Date	Review Action
October 22, 2008	DRAFT of functional framework of the CAPMT sent to companies
March 26, 2009	Steering Committee reviewed revised DRAFT of major functional elements of the CAPMT
March 26, 2009	Revised DRAFT of <b>major</b> functional elements of the CAPMT sent to companies
April 7, 2009	Companies approved the <b>major functional operating elements</b> of the CAPMT
April 7, 2009	Steering Committee notified of companies approved approval
June 11, 2009	Steering Committee authorized the project team to begin work to constitute the CAPMT as a recognized entity

As a result of this Phase 1 review process, the companies have approved the following objectives, assumptions, preliminary criteria, and **major functional operating elements** of the Center:

### **1. Objectives:**

- a. Undertake manufacturing technology development activities to assist industry in market diversification, competitiveness, quality and cost reduction measures.
- b. Provide engineering services to industry partners
- c. Improve and expand regional skilled labor pipeline.
- d. Establish marketing programs to promote partner industry and regional precision manufacturing capacity.

### **2. Assumptions**

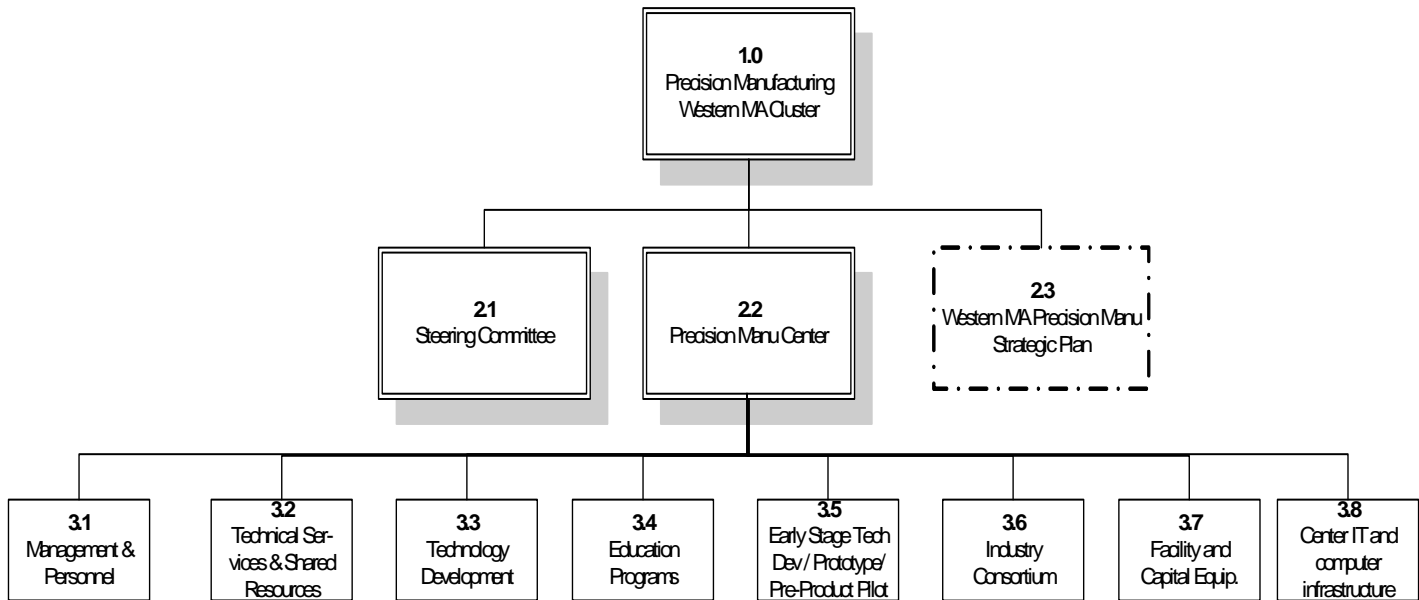
- a. The Center will be tailored primarily to service the precision machining industry.
- b. Shared resources and facilities will be used effectively, overcoming proprietary issues and competitive pressures.
- c. IP and technology commercialization will be provided by UMass Amherst as well as from other research institutions and private sources.
- d. Market demands and new applications projections will be forecasted using current and publicly available estimations.
- e. Funding assumptions will be detailed as part of the budget development.
- f. Industry “pull” side of the technology will be the dominant factor in the design of the Center and the selection of functionality/implementation.

### **3. Preliminary Criteria**

The Criteria for selecting the final functionality and operation of the Center will be determined by the needs of the industry primarily the precision machining and secondarily the precision manufacturing and will include the following elements:

- a. Fit with current strengths and maximize response to present needs of Precision Manufacturing industry in the region
- b. Maximize services for future needs of Precision Manufacturing industry in the region
- c. Leverage education/workforce training capacity of local community colleges and universities
- d. Return on Initial Investment
- e. Sustainability
- f. Maximize economic development benefits for the region.
- g. Center’s facilities and each of its associated functional elements shall have the potential to be a nationally recognized manufacturing services entity.
- h. Support of strong local champions
- i. Indirect impact on Pioneer Valley Region
- j. Facility recommendation- utilization of existing municipal infrastructure and fit within community’s growth plans
- k. If phased implementation is considered, “built out” to steady state size/operations should be done as soon as practical.

#### 4. Major Functional Operating Elements



In determining the functional elements to be included in the final design of the CAPMT, the project team has been studying various national centers for manufacturing technology to get an understanding of their design, organization, governance, and funding streams. As of June 15, 2009, the team has reviewed the following centers:

1. National Center for Defense Manufacturing and Machining (NCDMM) - Latrobe, PA
2. Center for Aerospace Manufacturing Technologies (CAMT) - Missouri University of Science and Technology, Rolla, MO.

The project team will continue to investigate additional center models and will report back to the Steering Committee and to the companies on the results of its due diligence.

#### **VII. Steps to Constitute the Center for Advanced Precision Manufacturing Technology (CAPMT)**

The Steering Committee at its meeting on **June 11, 2009** authorized the project team to investigate and seek guidance (legal, financial and otherwise) on the process and regulations necessary to constitute the Center for Advanced Precision Manufacturing Technology (CAPMT) as a recognizable entity with a scope of business that is consistent with the planned goals and objectives of the Center.

The team will report back to the Steering Committee and the companies on its work in this matter on or before October 1, 2009.