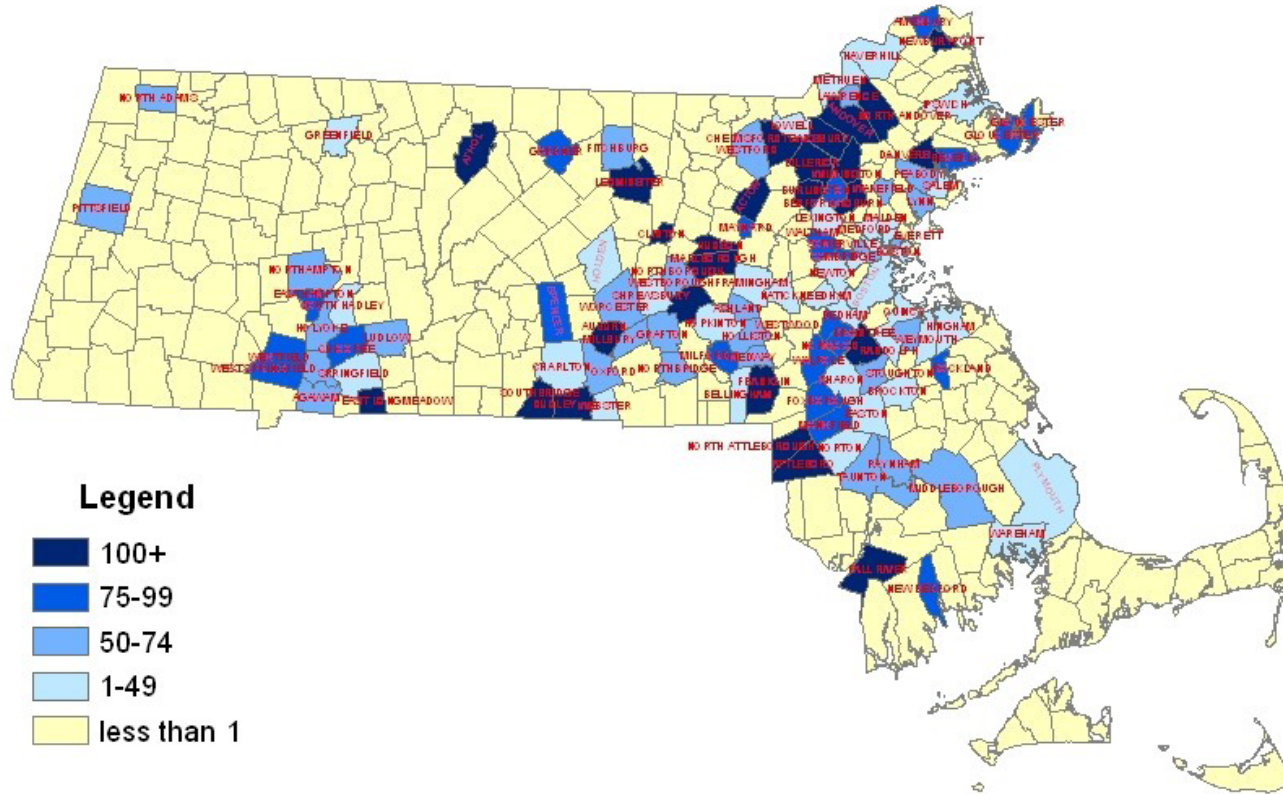


# Precision Manufacturing Regional Alliance Project (PMRAP)

Presentation to  
Patrick D. Gallagher, Director  
National Institute of Standards & Technology  
September 27, 2010

# Manufacturing Employment per 1,000 Residents



Source: 2002 Economic Census

# Pioneer Valley - Regional Overview

- Springfield - Birthplace of the Industrial Revolution
- Manufacturing remains the third largest employer in the region after healthcare and retail
- Precision Manufacturing – 1,100 companies employing 28,000
  - Machining
  - Plastics
  - Paper & Packaging
  - Electrical/Electronic Components & Assemblies

# Background - RENEW

- RENEW – Regional Priority Grant – 2006-2008
  - Focus – Create a working partnership among the members of the Western MA Chapter of the National Tooling & Manufacturing Association, regional vocational/technical high schools and community colleges, and the Regional Employment Board of Hampden County, Inc.
  - Unmet Needs –
    - Address the talent pipeline issues of the precision machining manufacturers in the Pioneer Valley
  - Approach
    - Build partnerships with voc-tech schools
    - Join Machining/Manufacturing Councils within schools to drive curriculum and rebuild image of manufacturing as a career choice

# Background - PMRAP

- PMRAP – Project Award – 2008-2011
- Focus -Expand partnership to include UMass Amherst, Springfield Technical Community College, Holyoke Community College, Economic Development Council of Western Massachusetts
- Organizing issue - Changing market place creating new demands on suppliers
- Unmet Needs –
  - Talent
  - Technical assistance to address manufacturing bottlenecks and improve management capacity
  - Manufacturing Technology to enhance competitiveness
  - Information to enter expanded markets

# PMRAP Objectives

- **Strengthen partnerships** among sector companies and with local organizations to address current industry-wide issues, including workforce development and identification of new market opportunities.
- **Improve industry capability to engage new markets** by enhancing its infrastructure for technology development and integration through Technology Innovation Forums and a pilot Technology Transfer Program in partnership with UMass Amherst.
- **Directly improve industry capacity for innovation** by providing applications engineering support to assist firms in adopting new technologies, improving productivity, and expanding advanced manufacturing process, enabling companies to move up the supply-chain and tailor new manufacturing applications directly to growth markets, including medical devices, laboratory instrumentation, and clean energy.
- **Assess the feasibility of developing a Center for Advanced Precision Manufacturing Technology** that will serve as a sustainable industry “focal point” to provide services and lead growth initiatives

# Approach

- **User Needs Analysis focused on Precision Machining, as pilot to broader Precision Manufacturing Initiative**
- **Talent**
  - Expanded Voc-Tech Program
    - Regional Precision Manufacturing Advisory Council
  - Incumbent worker training at STCC
    - Certificate Program in Mechanical Engineering Technology
- **Market Expansion**
  - Market Opportunity Forums – understand emerging requirements & opportunities
  - Export market information – WISER – Holyoke Community College
  - Marketing Program w/ Western Mass EDC
- **Technical Assistance**
  - Technology Applications & Innovation Engineering Support
- **Technology & Innovation to enhance competitiveness, expand markets**
  - Innovation Forums - Exchange between companies and academic community
  - Technology Development/Tech Transfer Pilot Projects
- **Sustainability**
  - Feasibility assessment – Center for Advance Precision Manufacturing Technology

# Outcomes - Growth

Year	Number of Companies	Number of Employees	Sales
2005	24	899	\$108 MM
2006	29	993	\$155 MM
2007	33	1281	\$229 MM
2008	39	1386	\$252 MM
2009	36	1201	\$222 MM

# Workforce Development

## Incumbent Employees Training- October 2006-May 2010

Enrolled	Completed	Completion %
1176	1004	85%

## New Pipeline Skills Training October -2007-January 2009

Enrolled	Completed	Employment
40	34	31

## Machine Tool Technology Enrollment

2006	198
2009	287

# Technology Innovation and Applications Engineer

- Located at Springfield Technical Community College
- Shared Resource to Precision Machining Companies
  1. Tooling, Fixturing and Machining Technology
  2. Work Process Improvements
  3. Quality Assurance, Process Control and Inspection
  4. New Materials Technology
- Liaison with UMass Faculty/Researchers
- Coordinating Technology Transfer Project with Industry-University Partners

# Certificate Program at STCC

- New 1 Year Certificate Program in Mechanical Engineering Technology
- Informed by Technology Transfer Projects
- Focus on New Technology and Improving Manufacturing Processes
- Pathway to Associate and Bachelor's Degree

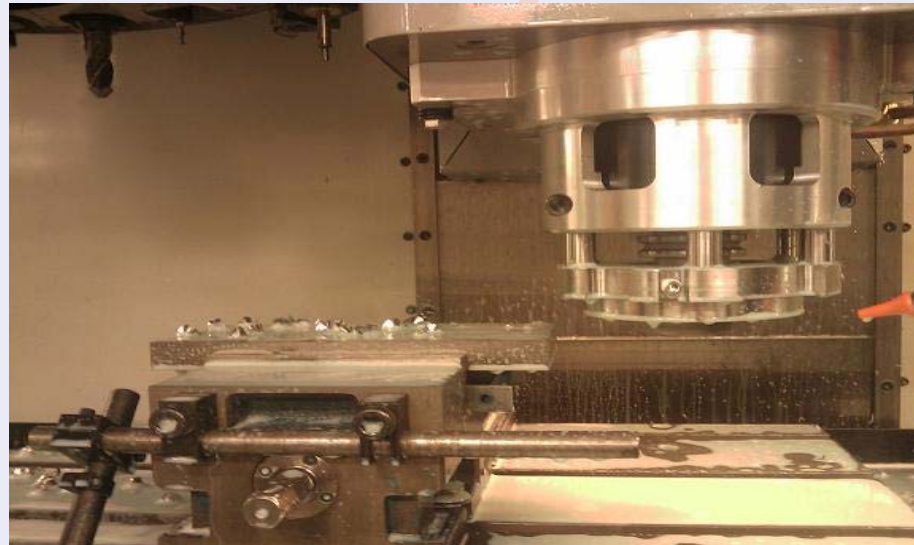
# Technology Innovation Forums

- Provide the precision machining companies and faculty researchers at UMass with an opportunity to exchange information about industry technology needs and relevant research/discoveries.
- Forums: Participating Companies:18  
Company Representatives:35
  1. Non Metallic Machining and Processing Technologies
  2. Manufacturing Process Optimization
  3. Cryogenic Machining
  4. Metals and Composites Interfaces
  5. Operational Process Improvement in a Changing Manufacturing Environment
  6. Cooperative Business Networks

# PMRAP Technology Transfer

## Cryogenic Machining (Milling)

Research Team: WMNTMA Companies, REB, UMass, STCC, Air Products & Chemicals



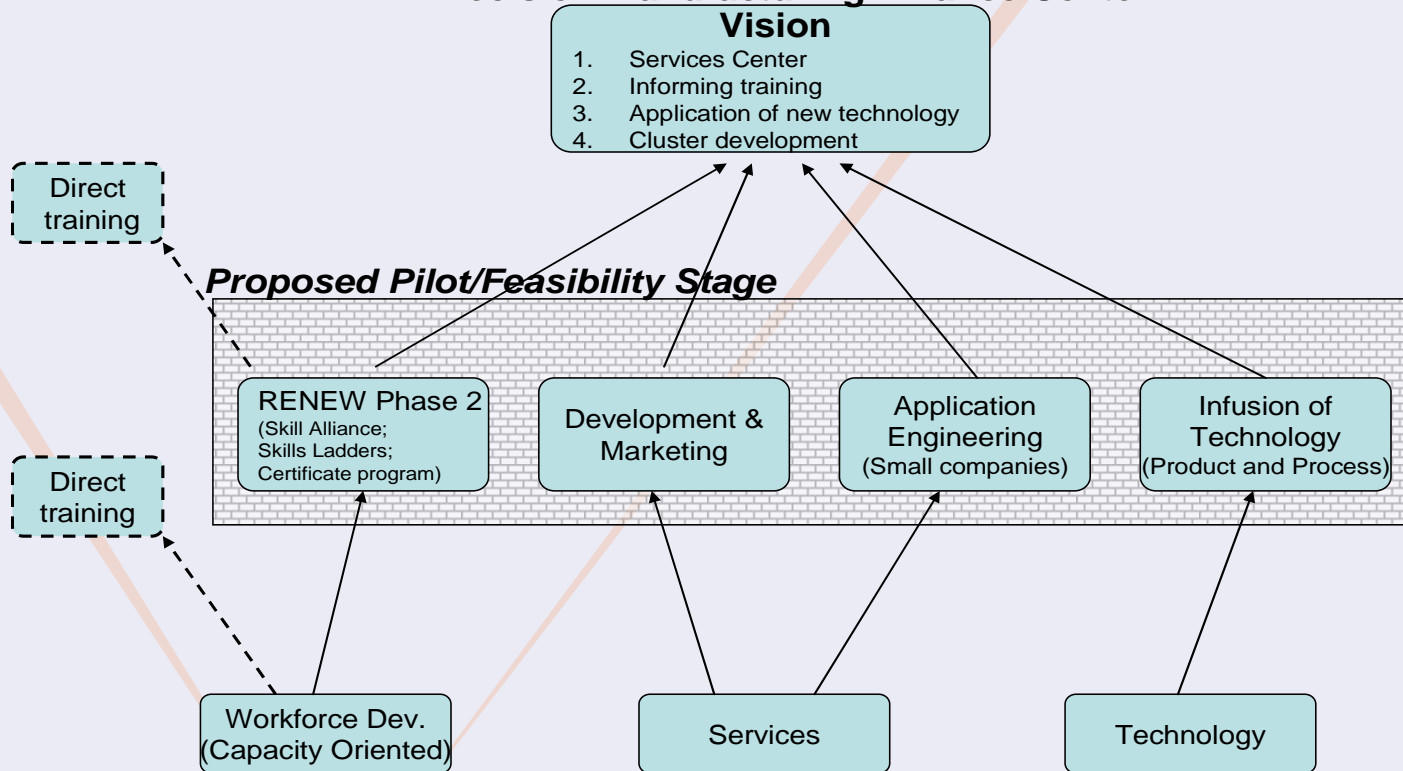
# NSF-PFI Technology Research Projects

## UMass and Individual WMNTMA Companies

1. Polymer-Metallic Interfaces
2. Machining of Polymer Gels
3. Telescoping Mast Design
4. Roll to Roll Embossing of Micro and Nano Features onto Polymeric Films
5. New Implant Materials for Total Knee/Hip Replacement Surgery

# Massachusetts Center for Advanced Precision Manufacturing Technology Inc.

## PV Precision Manufacturing Alliance Center



# Key Challenges

- Can we expand the existing partnership to include the broader precision manufacturing sector in the region?
- How do we sustain the partnership over time?
  - Center for Advanced Precision Manufacturing Technology
- How do we effectively leverage other state and federal resources?
  - MMEP
  - SBDC
  - Capital Assistance (Mass Development, Mass Growth Capital Corporation, etc.)
  - SBIR/STTR
- How do we build on this experience to enhance manufacturing competitiveness across Massachusetts?

# PMRAP Partners

- Regional Employment Board of Hampden County, Inc. (REB) - (Lead Agency)
- Western Massachusetts Chapter of the National Tooling and Machining Association (WMNTMA)
- Western Massachusetts Economic Development Council of (EDC)
- World Institute of Strategic Economic Research (WISER) at Holyoke Community College (HCC)
- University of Massachusetts at Amherst (UMass)
- Springfield Technical Community College (STCC)
- Six (6) Technical High Schools in Hampden, Hampshire and Franklin Counties