2013 Update to the Membership
“Get involved...it’s worth it!”

TECHNICAL EDUCATION CONFERENCE
March 11, 2013
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Acknowledging the Current Situation

The inaugural MACWIC meeting was held in February 2012, and the audience heard the call for action from large and small manufacturers as well as vocational and community college educators. Two-thirds of the audience was manufacturers, representing 12,000 employees and $4 billion in sales revenue.

The impetus for the meeting hinged on the key workforce challenges that manufacturers are facing:

- An aging workforce
- Rapid changes in technology require more math and science, better writing and communications skills, and someone who can learn all the time
- Low enrollment in vocational high school Machine Tool Technology programs
- It takes years to develop replacements for highly skilled and experienced workers

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<tr>
<th></th>
<th>2000</th>
<th>2006</th>
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<tbody>
<tr>
<td>Manufacturing</td>
<td>40.5%</td>
<td>49.6%</td>
<td>53.9%</td>
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<tr>
<td>All other industries</td>
<td>36.1%</td>
<td>41.4%</td>
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<td>Difference between manufacturing and all other industries (% point)</td>
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Source: American Community Survey, Public Use Files, 2006, 2010, Tabulations by Center for Labor Market Studies and Dukakis Center for Urban and Regional Policy, Northeastern University

Though manufacturing is a vital sector of Massachusetts’ economy, and jobs are well-paying, the pipeline is not generating sufficient qualified candidates. Not enough are entering and graduating from programs at community colleges and vocational schools. Those that do graduate are not all entering the industry. To that point, in 2011 community colleges graduated:

- Engineering Technologies/Technicians 599
- Engineering 69
The Call to Come Together

The questions were asked:

- Can we agree that there are things that can be done?
- Do we understand the challenges and what makes it difficult to address our workforce challenges?
- When we invest in human capital, what are the risks and do we know how to recognize the benefits?

In order to take control of the future, it was apparent that it would be advantageous to work as a collaborative. By stepping up to step forward together, we can achieve that which we can’t achieve individually.

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<th>Industry</th>
<th>Employment</th>
<th>%</th>
<th>Average Weekly Wages</th>
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<td>100%</td>
<td>$1,493</td>
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<td>Fabricated Metal Product Mfg.</td>
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<td>Food Manufacturing</td>
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<td>Printing and Related Support Activities</td>
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Steering Committee Sets the Course

Chair: Thomas A. Wesley, Director, Strategy and Operations Excellence, Waters Corporation

The stage was set that provided the spark for the Steering Committee to take charge and set the course for the organization for its first year. In its first meetings, the committee agreed that a clear goal, problem statement and objectives were necessary to keep MACWIC unified and headed in a central direction. Further discussion identified the lack of interest in manufacturing jobs. This led to fleshing out the need for educating parents about the good jobs in manufacturing and the income related to various pathways, as well as providing the general population an updated view of manufacturing and careers offered.

Dialing in to the main workforce challenge, the committee concluded that a "grow your own" approach would be most effective. This solution should consider a method that will enable the organization to participate actively in sustaining and continuing the cycle of skill improvement and career path advancement.

The “grow your own approach” would include these elements:
1) Leverage existing resources to elevate current skill sets and attract people to manufacturing.
2) Take the existing people in our organizations and provide them with the appropriate skills upgrades to allow them to move into needed skill areas.
3) Backfill the created position openings with new hires that are basically prepared to enter the workplace.
4) Enable people with minimum skills who will represent a teachable fit that can then move through the organization.

The alternative is to hire what is available and see if it works. A proactive approach has a higher probability for success.

With these thought sessions behind them, the Steering Committee recognized that MACWIC was poised to be a tactical organization, and thus identified three objectives:
- Short-term: Leverage existing resources, “scalable, tactical response to today’s needs.”
- Mid-range: Manufacturing Academy, focus on critical skills
- Long-term: Fill the pipeline
Through continued discussion, the committee determined that many manufacturers are not aware of the resources available to them, as well as what the lay of the land is for workforce development. Resource map: prepare gap analysis as relates to the workforce and education committees needs assessments.

This draft was presented to the membership at the May quarterly meeting and approved. The Steering Committee also announced that the following tasks had been accomplished during MACWIC’s first 90 days:

- Multi-level training tiers were identified, comprising a five-tier manufacturing career pathway
- Workforce credentialing completed, with articulation at Quinsigamond Community College as an option
- Manufacturers survey completed regarding incumbent worker skills needs
- Veterans training plan approved and MACWIC members to have first interview opportunities

In September the Steering Committee reaffirmed the organization’s purpose.

“We are a company led network made up of active employer participants working collaboratively to identify common issues and challenges and implement solutions relating to:

- Common business and workforce problems
- Best practices in sustaining talent and catalyzing talent pipelines

...allowing members to:

- Make positive and lasting impact on their businesses
- Participate in growing innovative member partnerships from the ground up
- Network with a broad range of businesses and industry leaders

Our continuing goals:

- To offer MACWIC membership a broad range of skills training options, coupled with a credentialing system and a defined career pathway mechanism to build skills beyond the entry level threshold
- To fill the pipeline of talent for the future generations of manufacturing operations.”

Following these rallying statements, the Manufacturing Skills Academy Network (MSAN) was announced and launched. MSAN is supported by MACWIC member companies, partners, and individuals committed to developing 21st century manufacturing talent. It is staffed by member
companies to upgrade the skills of the current workforce and intended to maintain Massachusetts’ global competitiveness. Initial classes will be held at the MassMEP Offices in Worcester, and future courses will also be held at member companies.

The first year concluded with Waters Corporation sharing that it has prioritized MACWIC and MSAN as part of its Corporate Sustainability Program. Waters recognizes that long-term growth and sustained performance is heavily dependent upon maintaining a highly talented and renewable workforce in Massachusetts. Accordingly, Waters is collaborating to provide access to in-house training as well as in-kind support to collateral activities. This demonstrates Waters’ belief that the private sector holds responsibility for its own success as a member of a broader community.

A membership goal for 2012 was set at growing MACWIC to represent companies that employed 15,000. That goal was met by October and at the December meeting the Steering Committee reported membership of 80+ members (Companies, Educational Institutions, Government, Non-Profits), 16,500 employees, $5.3B in revenue. Early marketing activities include the MACWIC website which can be found at www.MACWIC.org. MACWIC can also be found on www.facebook.com/MACWIC and www.twitter.com/MAC_WIC.

The MACWIC journey continues. Moving into 2013, the Steering Committee has identified early goals for preparing a Visioning Document, Membership Kit and Marketing Plan.
Education/Training Committee

Chair: Bryant Laflamme, Precision Machining & Automated Manufacturing Instructor, Assabet Valley Regional Technical High School

This committee focused its work on credentialing and long term solutions, whereas the Workforce Committee focused on tactical initiatives to address the current need for qualified employees.

The Education Committee began by asking: What do we want in a skilled person? Given that Massachusetts manufacturing encompasses a variety of niche markets, they agreed that are core competencies that serve all regardless of niche. They also agreed that basic STEM knowledge is the requisite base. With that in mind, the committee conducted a survey of MACWIC members that would allow them to determine these core competencies.

This committee was charged with creating a standard set of stackable credentials which utilize existing educational resources. This will reduce the cost to hire by creating industry standard skills levels and can be replicated across the state. Healthcare provides a good example. Costs for hiring are very low in this industry because of the certification levels that are standard. If a healthcare organization wants to hire a CNA or LPN, for example, they know what they are getting because the position requirements are standardized. Manufacturing has not yet benefitted from this approach.
With early work at establishing levels completed, the certification pathway was embraced by DESE and incorporated into the “Frameworks” for vocational training statewide. In order to ensure consistent curriculum, the committee recommended identifying and/or producing curriculum for each module in Levels 1 and 2.

The next step was to establish and revise exams according to industry needs and trends. They set sights on starting with creating an exam that will cover the Level 1 and Level 2 standards. Student exams will take place at their schools and be proctored by industry professionals. Certifications will be issued, with each certification numbered and traceable to an individual. The first exams will be given in May 2013.

Committed to continuous improvement and sustainability, the process established allows for tracking student progress and collecting data to continue to develop relevant curriculum and revise exams.
Workforce/Manufacturing Skills Academy Network (MSAN) Committee

Chair: Amy Ackroyd, Vice President of Human Resources, TRU Corporation

The Workforce Committee focused on tactical initiatives to address the current need for qualified employees. Resources were identified that can provide access to new hires through Veteran’s training that is giving veterans basic manufacturing skills, and the MassMEP HiB grant that is training CNC operators. MACWIC members are provided a link to access recent candidates resumes on STEMPower.org.

Additional resources that can be utilized to “skill up” the incumbent workforce include the Workforce Training Funds Grants and the Hiring Incentive Training Grants. MACWIC companies were polled about the interest in being part of a collaborative Workforce Training Fund Grant. This enables smaller companies to join forces to access training opportunities that they may not be able to access individually.

Recognizing that on-boarding new hires can set the stage for success when done thoughtfully, members learned about the 8/7/6 Guide. This system gives assistance for manufacturers to create their own customized OJT process:

1) Establishes on-boarding protocol for new employees
2) Defines competencies associated with a job description
3) Breaks the competencies into tasks
4) Prioritizes the tasks for maximum skill acquisition
5) Establishes a time line
6) Validates the training process

The outcome is that when OJT is combined with the credential system you will significantly reduce the amount of time and money manufacturers spend recruiting and training employees.

Upon completing these early goals, the Workforce Committee turned its energy to establishing the Manufacturing Skills Academy Network (MSAN). The committee renamed itself as the MSAN Committee. This innovative concept has emerged as a training initiative staffed by member companies to upgrade the skills of the current workforce to keep up with rapidly changing technology and maintain Massachusetts’ global competitiveness.
Classes were initially scheduled in central Massachusetts (Worcester) and have also been established in the northeast region (Billerica). Plans are also in place to launch classes in southeastern MA.

Classes are comprised of 4-hour modules, with the subject matter dictating the number of modules offered. Course topics offered to date include:

<table>
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<tr>
<th>Course Topic</th>
<th>Modules</th>
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<tbody>
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<td>Shop Math*</td>
<td>2</td>
</tr>
<tr>
<td>Blueprint Reading*</td>
<td>2</td>
</tr>
<tr>
<td>Metrology &amp; Quality Inspection*</td>
<td>4</td>
</tr>
<tr>
<td>CNC Mill Concepts &amp; Hands-On*</td>
<td>5</td>
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<tr>
<td>G Code for Mills*</td>
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<tr>
<td>CNC Lathe Concepts &amp; Hands-On*</td>
<td>5</td>
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<tr>
<td>G Code for Lathes*</td>
<td>1</td>
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<tr>
<td>Statistical Process Control</td>
<td>2</td>
</tr>
<tr>
<td>Geometric Dimensioning &amp; Tolerancing</td>
<td>2</td>
</tr>
</tbody>
</table>

Completion of all asterisked modules (Shop Math, Blueprint Reading, Metrology & Quality Inspection, G Code for Mills, G Code for Lathes, CNC Mill Concepts & Hands-On, CNC Lathe Concepts & Hands-On — 80 hours total) will qualify for a MACWIC Level 2 Certification.
Pipeline Committee

Chair: Gabor Hajos, Vice President, Operations, Curtis Industries

An opportunity presented itself to MACWIC. Worcester Technical High School (WTHS) Machine Tool Technology was facing declining enrollments in its Machine Tool Technology program (<10 per 400 students). With few incoming students indicating interest in the program, pressure to reallocate resources was increasing, despite the need for young people with these skills within the manufacturing community. An Ad Hoc Committee was formed in June 2012 as a partnership between WTHS and MACWIC. Discussion ensued that dug into root causes and countermeasures, and resulted in a targeted approach to improve enrollment numbers. The targeted approach included:

Focused Marketing: Mini-Explorer Week
- Mini-Explorer presentation rehearsed w/feedback
- Students received welcome package/letter August 22
- Career paths (salary, education, job level): Unlock Your Potential in Today’s Manufacturing World
- Applied Manufacturing Technology Certification Pathway
- Today’s Advanced Manufacturing in Central Massachusetts
- Links to multi-media Machine Technology videos: How Machine Tools and Manufacturing helped someone’s dreams become reality!
- Multiple Success Stories (w/flash drive)
- Machine Tool Technology students selected for special assignment
- Tours of WPI and Nypro
- Industry supported Open House
- Parents also received information package/letter

This approach resulted in increasing exploratory enrollment to 64 students as of September 10, 2012. This included 34 original students, 30 additional change forms signed, and additional change forms in process. The next challenge will be retention. The goal is to maintain contact and interest in Machine Tool Technology by continued activities and enhancements that are in planning stages.

Examples of the letters sent to Students and Parents are included here.
These links show what it’s like to be part of today’s advanced manufacturing.

Edge Factor  
http://www.edgefactor.com/

AMP it up!  
http://ampitupma.com/

Advanced Manufacturing in Central MA  
http://www.youtube.com/watch?v=rTA68FO4Fx4

Is Manufacturing Here to Stay?  
http://www.youtube.com/watch?v=Z_eygKncYiU

Manufacturing Jobs Today  
http://www.youtube.com/watch?v=WsDsComFTxc&feature=relmfu

Basic Manufacturing Skills  
http://www.youtube.com/watch?v=hZLvK_ZqDZ8&feature=relmfu

Learn More About Manufacturing Jobs and Careers  
http://www.youtube.com/watch?v=_Zwdr8WZzLk&feature=relmfu
Sample Exploratory Letter

Worcester Technical High School
Precision Machining & CNC Automation Department
1 Skyline Drive
Worcester, MA 01605

Dear ____________________________,

Mr. Hurley and Mr. Cummings would like to take this opportunity to thank you for exploring the “MT” – Precision Machining & CNC Automation department. It has been our pleasure to show you the various machining projects, and to train you in the use of CNC Machining, CAD/CAM software, and Automated Manufacturing. We have enjoyed this opportunity, and hope you have too.

It is our hope that you will consider a career in Advanced Manufacturing/Machining, as the current job market and manufacturing opportunities are endless. Several area machining and manufacturing companies are seeking our students, and are paying great wages.

We look forward to answering any additional questions you may have, and giving you and your parents/guardians the opportunity to get to know us, and what we do in Precision Machining & CNC Automation.

You and/or your parents/guardians may contact us directly anytime at (508) 751-7526 or (508) 799-1992. We also look forward to meeting you and your parents/guardians at our annual Open House on Wednesday, November 14th from 6:00-8:00 P.M.

Please be sure to check out the following website and review the videos online to give you an exciting view into today’s manufacturing opportunities: www.edgefactor.com

Sincerely,

Mr. Hurley & Mr. Cummings
Precision Machining & CNC Automation
Sample Student Letter

Dear Worcester Technical High School Student,

Welcome to the Class of 2017!

The staff at Worcester Technical High School's Machine Tool Technology program would like to thank you for selecting them as one of your 6 exploratory choices.

During your exploratory phase, you have been pre-selected to participate in a hands-on demonstration with one of our machining centers.

A career in machine tools and the many interrelated disciplines in manufacturing can be FUN, very rewarding, and help someone’s dreams to become reality!

Did you know that our mayor has asked us to design the key to the city, and that we recreated the historic key from its original design in our Machine Technology Department? See how the Mayor of Worcester recognized our WTHS students at http://www.necn.com/06/19/12/Worcester-students-design-the-key-to-the/landing_newengland.html?blockID=727332&feedID=4206

In another example, see how machine tools and manufacturing helped someone’s dreams to become reality and allow them to snowboard again at http://edgefactor.com/edgefactorshow/episode3.

Machine Tool Technology is the only program that allows you to be a hands-on high-tech craftsman, while preparing you to work with a variety of materials (e.g., metals, plastics, ceramics), opening a career path to almost any industry, such as Aerospace, Medical, Defense, Healthcare, Technology, Renewable Energy, and other in-demand markets.

Advanced Manufacturing in Central Massachusetts has again become a viable career option with good opportunities offering competitive salaries. The Machine Tool Technology program at Worcester Technical High School can provide you with the foundation for your future, and help make your dreams come true! The opportunities are vast, and we look forward to your exploration of the potential available to you at Worcester Technical High School, and your participation in our hands-on demonstration with the Machine Technology Department. For more information, or answers to questions you may have, feel free to contact me at WTHS via telephone at (508) 799-1992, or by e-mail at HurleyM@TechHigh.us.

Sincerely yours,

Michael Hurley, Department Head, Machine Technology

Cc: Brian Cummings, Instructor

Sample Parent Letter

Dear Parent of a Worcester Technical High School Student,

[Student’s full name] has selected Machine Tool Technology as one of their 6 options during the exploratory phase.

Advanced Manufacturing in Central Massachusetts has again become a viable career option with good opportunities offering competitive salaries. But in order to grow one must have the skills, creativity and necessary training to get the job done right. The opportunities are vast, the potential is there and the jobs are waiting for skilled workers.

- Manufacturing is one of the largest employment sectors in Central Massachusetts.
- The impact of the Baby Boom generation leaving the workforce will leave a chasm of job opportunities waiting to be filled.
- Advanced educational and training opportunities will grow your career, advance your skill set and increase your earning potential.
- Work with high-tech machinery and cutting edge software to help build the future in the Aerospace, Medical, Defense, Healthcare, Technology, Renewable Energy and other in-demand markets.
- Work in exciting areas such as Engineering, Quality Assurance, Sales, Marketing and more.
- Work in a creative environment, build a rewarding career and gain a sense of accomplishment.

For example, see how machine tools and manufacturing helped someone’s dreams to become reality and allow them to snow board again at http://edgefactor.com/edgefactorshow/episode3. Experience in advanced manufacturing at the high school level will provide your [son/daughter] with a unique advantage if they chose to pursue a career directly after high school or continue on to higher education, as demonstrated by the chart on the next page.

Currently there are xxxxx jobs open in advanced manufacturing in Central Massachusetts.

There are many options for careers in manufacturing, and the Machine Tool Technology program at WTHS can provide a solid foundation for that successful future where dreams can become reality. For more information, or answers to questions you may have, feel free to contact me at WTHS via telephone at (508) 799-1992, or by e-mail at HurleyM@TechHigh.us.
Sincerely yours,

Michael Hurley, Department Head, Machine Technology

Cc: Brian Cummings, Instructor

Who Will *Teach* the Next Generation of Voc-Tech Manufacturing Students?

Speaker: Clem Fucci, Manufacturing Technology Dept. Chairperson, Westfield Vocational Technical High School

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**Machine Tool Technology Enrollment 2012-2013**

*Grades 10 through 12*

- Blackstone Valley Regional Vocational Technical
- Chicopee
- Franklin County Regional Vocational Technical
- Greater Fall River Regional Vocational Technical
- Greater New Bedford Regional Vocational Technical
- Leominster
- Nashoba Valley Regional Vocational Technical
- Northampton-Smith Vocational Agricultural
- Old Colony Regional Vocational Technical
- Pittsfield
- Somerville
- Southeastern Regional Vocational Technical
- Springfield
- Westfield
- Worcester

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Resources for Manufacturers

Massachusetts Office of Business Development
http://www.mass.gov/hed/economic/eohed/bd/

Helping companies create and retain jobs, as well as promote private investment in our state. We facilitate simplified, timely access to a host of governmental and non-governmental resources and incentive programs that will help businesses grow faster and stronger in Massachusetts. Provides services through nine regional offices across the Commonwealth, helping companies navigate and access the technical, human, financial, training, educational, and site finding resources necessary to expand or locate in Massachusetts.

10 Park Plaza, Suite 3730,
Boston, MA 02116
Main number: 617-973-8600
Fax number: 617-973-8554

Regional Contacts:

Central and North Central
Rosemary Scrivens, Regional Director
Massachusetts Office of Business Development
89 Shrewsbury Street, Suite 300,
Worcester, MA 01604
Phone: 508-792-7506
Fax: 508-792-7532
Email: rosemary.scrivens@state.ma.us

Greater Boston
Rich Pellagrini, Regional Director
Massachusetts Office of Business Development
10 Park Plaza, Suite 3730,
Boston, MA 02116
Phone: 617-973-8537
Fax: 617-973-8554
Email: Rich.Pellagrini@state.ma.us
Massachusetts Office of Business Development

Metro West
Arthur Robert, Regional Director
Massachusetts Office of Business Development
Innovation Building, Mass. Tech Collaborative
75 North Drive, Westborough, MA 01581
Phone: 508-439-5685
Fax: 617-973-8554
Email: Arthur.Robert@state.ma.us

Northeast
Peter Milano, Senior Regional Director
Massachusetts Office of Business Development
360 Merrimack Street, Building 5
Lawrence, MA 01843
Phone: (978) 970-1193
Email: Peter.Milano-sea@state.ma.us

Pioneer Valley and Berkshires
Mike Vedovelli, Senior Regional Director
Massachusetts Office of Business Development
1350 Main Street, Suite 110
Springfield, MA 01103
Phone: 413-733-5357
Fax: 413.755.1349
Email: Mike.Vedovelli@state.ma.us

Southeast and Cape and the Islands
Buddy Rocha, Regional Director
Massachusetts Office of Business Development
275 Martine Street, Suite 201
Fall River, MA 02723
Phone: (508) 730-1438
Fax: (508) 730-2702
Email: Buddy.Rocha@state.ma.us
Smaller Business Association of New England  
http://www.sbane.org/  
Provide a legislative voice for small business at the state and federal levels and to make practical information available to help business owners grow their companies.  
1601 Trapelo Road, Suite 212  
Waltham, MA 02451  
Voice (781) 890-9070  
Fax (781) 890-4567  
info@sbane.org

Workforce Training Fund  
www.mass.gov/lwd/employment-services/business-training-support/wtfp/  
The Workforce Training Fund is a state fund enacted into law in July 1998 and financed entirely by Massachusetts employers. Its purpose is to provide resources to Massachusetts businesses and workers to train current and newly hired employees.

Associated Industries of Massachusetts  
http://www.aimnet.org/  
Promote the well-being of its members and their employees and the prosperity of the Commonwealth of Massachusetts by: improving the economic climate of Massachusetts, proactively advocating fair and equitable public policy, providing relevant, reliable information and excellent services.  
Corporate Office  
One Beacon Street  
16th Floor  
Boston, MA 02108  
Phone: 617.262.1180  
Hotline: 800.470.6277  
Fax: 617.536.6785
MassDevelopment
www.massdevelopment.com/

MassDevelopment works with businesses, nonprofits, and local, state, and federal officials and agencies to strengthen the Massachusetts economy. Through these collaborations we help create jobs, increase the number of housing units, eliminate blight, and address factors limiting economic growth including transportation, energy, and infrastructure deficiencies.

Offering a wide range of finance programs and real estate development services, MassDevelopment supports economic growth, development, and investment across all sectors of the Massachusetts economy: public and private; commercial, industrial, and residential; and nonprofit, including healthcare, educational, cultural, and human service providers. Our staff works in collaboration with private- and public-sector developers, businesses, and banks to identify investors and leverage public and private funds to support economic growth.

MassDevelopment
160 Federal Street
Boston, MA 02110
(800) 445-8030

Massachusetts Growth Capital Corporation
http://www.mcdfc.com/

Create and preserve jobs at small businesses, women and minority owned businesses, and to promote economic development in underserved, gateway municipalities and low and moderate income communities.

529 Main Street
Schrafft Center, Suite 1M10
Charlestown, MA 02129
Tel: 617-523-6262
Fax: 617-523-7676
Small Business Development Centers
http://www.msbdc.org/

Provides one-to-one free comprehensive and confidential services focusing on, business growth and strategies, financing and loan assistance as well as strategic, marketing and operational analysis. In addition, low cost educational training programs are offered across the state targeted to the needs of small business.

State Office
Tillson House
University of Massachusetts
23 Tillson Farm Road
Amherst, MA 01003-9310
413-545-6301 | Fax: 413-545-1273

Massachusetts Manufacturing Extension Partnership, Inc.
http://www.massmep.org/

MassMEP helps companies to grow and innovate as a Next Generation Manufacturer
We believe that an innovative, successful manufacturing base is the key to higher paying jobs and a higher quality of life in the Commonwealth.

In order to grow, manufacturers in Massachusetts, and across the country, need to achieve world-class performance in at least some of the key Next Generation Manufacturing (NGM) areas. The NGM framework of strategies are a roadmap that will drive manufacturing growth and innovation into the 21st Century. The five essential NGM strategies are:

- Systemic Continuous Improvement
- Workforce Strategies
- Sustainability
- Technology Acceleration
- Global Supply Chain

All areas critical to to help your company to strategically grow. Call MassMEP today and grow your company into the future.

100 Grove Street, Suite 108
Worcester, MA 01605
508-831-7020
Massachusetts Division of Apprentice Standards
http://www.mass.gov/lwd/labor-standards/das/

Agency responsible for promoting, developing and servicing registered apprenticeship programs in the Commonwealth of Massachusetts.

Manufacturing Advancement Center, Inc.
http://www.massmac.org/

An organization founded to increase the competitiveness of advanced manufacturers in New England. We collaborate with employers and educational institutions to improve manufacturing in Massachusetts.
100 Grove Street
Worcester, MA 01605
Phone: (508) 831-7020
Fax: (508) 831-7215
Email: info@massmac.org

MACWIC
http://macwic.org/

Dynamic alliance of next-generation companies that work in a concerted effort to identify workforce-related business needs and to drive solutions. The MACWIC will provide a baseline for strategy development and subsequent action that will enable the alliance to adapt, succeed and profit in an ever-changing business environment.

100 Grove Street, Suite 108
Worcester, MA 01605
Phone: (508) 831-7020
Fax: (508) 831-7215
Email: info@massmac.org
Straight to CNC: Manual vs. CNC

Speaker: Professor Torbjorn Bergstrom, Operations Manager
Worcester Polytechnic Institute Manufacturing Laboratories

They say that a Swiss machinist apprentice starts with a piece of steel, a file, and a micrometer and they are told to make a cube. I don’t know the truth of this assertion, but it has a sort of elegance. It provides the apprentice insight into measurement and metal removal. It also lets them appreciate the ease of using a milling machine later in their training to complete the same task in minutes. This brings to mind books, like Ivanhoe, where we can almost feel what it is like to grow up in a feudal castle and go through the steps from page to squire and then knighthood or even apprentice, journeyman, and master.

When I started teaching students to program and operate machine tools, I was tasked with taking engineering students and enabling them to use the equipment to make something they have designed. I wasn’t given 7 years to take them through an apprenticeship program or even 7 months to train them; I was given 7 weeks and only four hours a week of lab time. We started on the first day making chips in a CNC lathe.

I knew that the “old-timers” insisted that students first understand how to use a manual machine before operating a CNC tool. They argued that you needed to have a feel for the process with your hands on the handles controlling the feed; feeling the cutting forces; and vibrations of the process. Since these were the “old-timers” that taught me, I believed them. The problem was I hadn’t used a manual machine tool for 10 to 15 years and could barely remember how to turn it on thus it wouldn’t have been safe for me to teach them with a manual machine.

In that first 7-week term the students and I taught each other how to program and use the machines. In the seven years since that first day I have had a hand in the instruction of thousands of students, most of them engineering students, although recently we’ve been using the engineering students to help train CNC operators and setup technicians.

The system we have developed involves the use of standalone multimedia teaching lessons that any pair of students can step through the series of lessons taking turns in the role of student and instructor. The lessons are intended to teach safe use of the equipment and to allow the students to become familiar and comfortable with the controllers and setup procedures.
The theory is that this system enables us to use students to teach each other the simple aspects of programming and using the equipment helps the staff to help them understand more complex and nuanced issues dealing with complex fixturing and complicated tooling and tool path selection. The reality is the students end up handling the most complex setups with very little help as the staff members tend to be interrupted too often to concentrate on anything complex.

Through the years I’ve traveled to meetings and met with instructors from all over the world. The training methods we’ve developed are frequently a topic of discussion. We almost always get to the question of the missing value of our students not getting a chance to feel the cutting forces through the handles. In the beginning, I was a little defensive when taking these questions because it seemed there may be some validity. In all of these meetings we would tour the local teaching institutions and local manufacturing facilities. I began to notice quickly that in the only places I saw row after row of manual machine tools was in the schools. Frequently the manual machines had been donated to the school by a company that was closing or upgrading to CNC equipment.

With that realization forming in my mind, I began to look critically at our teaching methods and their lack of manual machine tools. The arguments for starting with manual always revolved around the idea that machinists need to have a feel for the process to understand the influence of changes in feed, speed, and depth of cut. They will tell you that you need to have this feel for the process to truly understand what is going on and make good parts. It reminds me of a story I heard about a WWI fighter pilot visiting a Messerschmitt factory at the beginning of WWII and telling the engineers that the first thing they need to do is remove the cockpit glass so the pilots can feel the wind in their faces. If the pilots can feel the wind, they will know how fast they are going.

All of the CNC machine tools I’ve used have a power meter so I quickly began to discount the wind in the face / feel the force arguments. It is not hard to convince the students that power is directly related to cutting force. The other argument I’ve heard returns us to the feudal system. You will appreciate the easier methods more if you’ve done the work the hard way. This argument even extends to the discussion of teaching G-code or CAM first. One of my colleagues likes to point out that this is like saying you need to ride a horse from Boston to Worcester before you can appreciate the Mass Pike.

If we look critically at the real need and the value we can add to our students we need to consider the types of jobs they are doing and the type of equipment they will be using. Just because I learned it that way doesn’t mean I should teach it that way. In my experience starting with CNC is faster, safer, and creates qualified machinists that meet the needs of today’s industry. Auto technician training doesn’t start with the Model T.
LEAN MANAGEMENT In The FAST LANE

Seconds make or break the NASCAR pit crew. And teamwork means the difference between winning and losing. The same is true in Manufacturing. Come learn the basics of a NASCAR pit stop and how to apply these concepts to your workplace environment.

Attend this unique event to experience:
- Standardized Work
- Continuous Improvement
- Teamwork
- Metrics and Measurement

Each topic includes examples which demonstrate its use and application in the world of NASCAR racing. This is a unique opportunity to introduce or rejuvenize your lean initiative and culture.

“This was a very positive activity with lots of potential” said Tim McMahon, Lean Manufacturing Leader for OFS, Fitel. “I would highly recommend this event to others who are interested in further developing their lean concepts and teambuilding activities. Thompson Speedway is also an excellent venue for this event.”

For Further Information or to Register Your Team Contact:
Dick Ayers at 339-227-9607;
Kathie Mahoney at 508-831-7020
or kathiem@massmep.org

Event can be held at Thompson Speedway, Stafford Speedway or on site at your company.
Edge Factor

Keynote Speaker: Jeremy Bout
Host/Producer/ Executive Producer

What is Edge Factor?

Edge Factor is inspiring the next generation of skilled manufacturers by producing inspirational and action packed films that tell manufacturing stories and make the manufacturers the heroes. To correspond with these exciting episodes, we are developing interactive educational resources, called EDU Factor.

Why Edge Factor?

Before Edge Factor, I worked for 12 years as a CNC programmer. I quickly realized how difficult it was to explain what I did, why it mattered and how it contributed to the world. The majority of the general public has a very limited understanding of how critical manufacturing is to our economy. The future of North America depends on people realizing that manufacturing is the backbone of our economy.

I decided to use my passion for art and media to unlock the awesome world of manufacturing to the public. In June 2010, Edge Factor was born.

Jeremy Bout
Producer, Host of Edge Factor

www.edgefactor.com

About Jeremy:

Jeremy Bout is an independent producer who focuses on new-media content creation. His ability to merge digital technology with new media projects has opened opportunities across the continent. The diversity of the projects have ranged from shooting on the tracks with the Joe Gibbs NASCAR team to creating videos with Grammy winning musicians in Nashville.

Jeremy spent 12 years in design and tool engineering. With his versatile background in film, media and manufacturing, Jeremy is able to produce creative films that tell real life manufacturing stories and show the manufacturers to be the heroes.
From the creators of Edge Factor comes the edu FACTOR series, "Launchpoint": a fast paced, high impact video series. In these 15 episodes, recent graduates tell their stories of success. This series will equip the next generation with unique insights on educational and career pathways students can emulate as they consider how to launch their own rewarding career in manufacturing.

**EACH EPISODE PROVIDES INSIGHTS ON:**

- What attracted the graduate to a career in manufacturing?
- What was their educational pathway?
- What opportunities did they have before and after graduating?
- What was their on the job training process?
- What does their job entail? What are some of their daily tasks?
- Statistics on the wages and financial benefits.
- What future opportunities are available for them in their field?

**WHY "LAUNCHPOINT" YOU ASK? THE ANSWER IS SIMPLE:**

- For a student and their parent to make the decision that manufacturing will become their career choice, they need to know the incredible opportunities in front of them. We believe the best way to inspire them to take the next step is to show them pathways they can emulate. They need simple footsteps to follow. This series will provide details in the context of real people who are sold out in their career pathway, giving students the push they need to launch their career.
edu FACTOR 2013: Products

How can HTEC Massachusetts Get Involved?

In 2013, Edge Factor is planning to produce a 15 episode “LaunchPoint” series, featuring 5 different U.S. locations with 3 episodes produced in each location.

Edge Factor proudly invites HTEC Massachusetts to partner with us and collaborate with your local manufacturing community to have Massachusetts as one of the five exclusive locations that the “LaunchPoint” series will feature in 2013.

At a cost of $15,000 per episode, the total cost for these 3 productions will be $45,000. We recognize that this cost is more than any single organization can cover, but we believe by the collective power of the industry, we can make this happen. For HTEC Massachusetts to ensure that Massachusetts is included in the 2013 series, you will be responsible to raise $5000 per episode, for a total of $15,000 for three episodes. Edge Factor is working with other industry leaders to fund the balance of the support for this initiative. We will select which locations will be included in the series based on their financial commitment to the plan outlined in this document. This decision is based on a first-come, first-serve basis.

How can HTEC Massachusetts use these videos?

HTEC Massachusetts will have a fully licensed copy of the “LaunchPoint” episodes you sponsor for recruitment and marketing purposes. As the owner of this video series, Edge Factor reserves the sole right to distribute the “LaunchPoint” series to our networks across North America.

How will Edge Factor use these videos?

Edge Factor is working and planning with leading educational organizations to distribute the “LaunchPoint” series. With the collective power of these educational networks, Edge Factor can reasonably expect these cutting-edge episodes to be distributed to nearly 1,000,000 students in 2014.

(continued)
edu FACTOR 2013: Products

Where will these episodes be shown?

**In the classroom:** Edge Factor is creating a series of distribution networks that we estimate within the next few years will reach close to 1,000,000 students on an annual basis. Through a subscription process, technical colleges, curriculum developers, and training centers around the world will be able to access the edu FACTOR products. We are currently in close discussions with PLTW, HTEC, Dream It. Do It., SME, Tooling U and others in regards to the best distribution methods of these products within each of their networks.

**5 Key Locations:** As part of the agreement with each of the 5 Location Partners, they will be using and promoting these videos in their state. Each of them will have a plan on locations and events that they will promote their involvement including websites, events and news coverage for the candidates.

**Television Series:** As Edge Factor continues to build our network of distribution, we are currently in close discussions that will make it possible to show these episodes at various state level television stations. Details coming soon.

**What makes the LaunchPoint series unique:**

This series is not only useful as a resource for recruiting students today, but also can be used for years to come. We estimate edu FACTOR products will be used in Community Colleges, High Schools, Middle Schools and other training venues. The “LaunchPoint” series truly is evergreen programming which adds value to the sponsor for their investment in this series and will have a lasting impact on the future of manufacturing.

**For additional information please contact:**

Jeremy Bout, Producer
Edge Factor
jbout@edgefactor.com
Studio Line: (905) 563-9547
Cell: (905) 401-3035
www.edgefactor.com
All About MACWIC

Let’s work together to leverage the significant resources that reside within our manufacturing community.

Vision and Mission

The MACWIC is a dynamic alliance of next-generation companies that work in a concerted effort to identify workforce-related business needs and to drive solutions.

The MACWIC will provide a baseline for strategy development and subsequent action that will enable the alliance to adapt, succeed and profit in an ever-changing business environment.

- Build a company-led network that is committed to active participation to identify common issues and challenges and seek synergistic solutions.
- Create a talent pool to meet current and future workforce needs.
- Develop relevant deployable curriculum in partnership with Workforce Training Service Providers, Technical High Schools, Community Colleges and Universities.
- Increase availability of technical training resources.
- Become recognized as the body that initiates and directs effective efforts with local and state government.
Benefits of Membership

The Manufacturing Advancement Center Workforce Innovation Collaborative is a dynamic alliance of next-generation companies that will work in a concerted effort to identify workforce-related business needs and to drive solutions.

The following objectives will provide a baseline for strategy and subsequent action that enable the alliance to adapt, succeed and profit in a, dynamic, ever-changing business environment:

- Build a company-led network that is committed to active participation to identify common issues and challenges and seek synergistic solutions.
- Create a talent pool to meet current and future workforce needs.
- Develop relevant deployable curriculum in partnership with Workforce Training Service Providers, Technical High Schools, Community Colleges and Universities.
- Increase availability of technical training resources.
- Become recognized as the body that initiates and directs effective efforts with local and state government.

The time for solutions and a unified voice is now. Workforce skills shortages are significant and expected to grow over time. Employers are facing the reality that a critical level of experienced workers has retired and the tribal knowledge that exists on the shop floor falls far short of being able to replace the lost knowledge and expertise. Massachusetts has identified the importance that advanced manufacturing has in the state’s economy and its path out of current economic doldrums. Never has there been a better time for this alliance to gain momentum because it has the ear of our state’s officials.

Who Should Join: Manufacturers, Technical Educators, Industry Association Representatives, Workforce Development Professionals

Benefits of Membership:
- Solve common business and workforce problems
- Share best practices
- Catalyze the talent pipeline
- Make a positive and lasting impact on your business future and the future of Advanced Manufacturing in Massachusetts
- Participate in growing an innovative member partnership from the ground up
- Network with other business and industry leaders
By-Laws

Article I. Name
The name of this organization shall be the Manufacturing Advancement Center Workforce Innovation Collaborative (MACWIC).

Article II. Purpose and Goals
The MACWIC is a dynamic alliance of next-generation companies that work in a concerted effort to identify workforce-related business needs and to drive solutions. The following objectives will provide a baseline for strategy and subsequent action that enable the alliance to adapt, succeed and profit in an ever-changing business environment.

The goals of this Collaborative shall be:
- Build a company-led network that is committed to active participation to identify common issues and challenges and seek synergistic solutions.
- Create a talent pool to meet current and future workforce needs.
- Influence the development of relevant, deployable curriculum in partnership with Workforce Training Service Providers, Technical High Schools, Community Colleges and Universities.
- Increase technical training resources.
- Become recognized as the body that initiates and directs effective efforts with local and state government.

Article III. Structure
The MACWIC shall be guided by a Steering Committee of MACWIC members. The Steering Committee will develop and oversee MACWIC policies, finance, public relations and continuity. Sub-committees will include Education/Training, Manufacturing Skills Academy Network (MSAN), Pipeline and any others as deemed necessary to achieve MACWIC goals.

Article IV. Membership
Members include manufacturers, education and technical training providers, industry association representatives, and workforce development professionals. Memberships will be renewed annually by execution of an updated Memorandum of Agreement.

Article V. Fiscal Year
The fiscal year shall be July 1 through June 30.
Membership Application

1. Goals
   - Build a company-led network that is committed to active participation to identify common issues and challenges and seek synergistic solutions.
   - Create a talent pool to meet current and future workforce needs.
   - Develop relevant deployable curriculum in partnership with Workforce Training Service Providers, Technical High Schools, Community Colleges and Universities.
   - Increase technical training resources.
   - Become recognized as the body that informs and directs initiatives with local and state government.

2. Purpose of This Memorandum
   This Memorandum of Agreement (MOA) outlines the agreement between the partners of the Manufacturing Advancement Center Workforce Innovation Collaborative (MACWIC). The MACWIC is a dynamic alliance of next-generation companies that work in a concerted effort to identify workforce-related business needs and to drive solutions. The MACWIC will provide a baseline for strategy development and subsequent action that will enable the alliance to adapt, succeed and profit in an ever-changing business environment.

3. Term
   This MOA shall be in affect from February 16, 2012 and shall end on February 15, 2013. This MOA may be terminated by the Steering Committee prior to the effective end date.

4. Partners
   Partners include manufacturers, education and technical training providers, industry association representatives, and workforce development professionals.

5. Roles and Expectations of Partners
   The members of the Collaborative in addition to the general terms and conditions agree to:
   - Sign an MOA that confirms agreement to be an active member.
   - Agree to attend quarterly Collaborative meetings.
   - Join and participate in one sub-committee and attend (or send a proxy to) at least 3 quarterly meetings, schedule TBD by chair.
   - Respond to surveys that will generate data trends in hiring, technology and other business-related issues relevant to the Collaborative’s goals.

Authorized Signature_______________________________________ Date: ______________
Contact Information (all correspondence regarding MACWIC business will be sent to this person)

Name _____________________________________________________________

Title _______________________________________________________________

Company___________________________________________________________

Phone _____________________________________________________________

Email ______________________________________________________________

Number of Employees (if not a manufacturer, please enter 0): ______________

Please rank your sub-committee in order of preference: 1 for your first choice and 2 for your second choice.

__ Steering Committee
__ Education/Training Committee
__ Manufacturing Skills Academy Network (MSAN) Committee
__ Pipeline Committee

Would you consider being a Committee Chair / Co-Chair?      ____ Yes   ____No

PLEASE RETURN SIGNED COPY OR JOIN ON MACWIC.ORG:

EMAIL    lisao@massmep.org
FAX      508-831-7215
MAIL     Lisa Derby Oden
          Manufacturing Advancement Center
          100 Grove St., Suite 108
          Worcester, MA 01605
Manufacturing Skills Academy Network

The Manufacturing Skills Academy Network (MSAN) is supported by MACWIC member companies, partners, and individuals committed to developing 21st century manufacturing talent.

This innovative concept has emerged as a training initiative staffed by member companies to upgrade the skills of the current workforce to keep up with rapidly changing technology and maintain Massachusetts’ global competitiveness.

Skill areas can include the following and are not limited to these skills:
- Basic Manufacturing Skills
- Geometric Dimensioning and Tolerancing
- CNC Operator Skills
- Lean Management

Classes are comprised of 4-hour modules, with the subject matter dictating the number of modules offered. Course topics offered to date include:

- Shop Math* 2 modules
- Blueprint Reading* 2 modules
- Metrology & Quality Inspection* 4 modules
- CNC Mill Concepts & Hands-On* 5 modules
- G Code for Mills* 1 module
- CNC Lathe Concepts & Hands-On* 5 modules
- G Code for Lathes* 1 module
- Statistical Process Control 2 modules
- Geometric Dimensioning & Tolerancing 2 modules

Completion of all asterisked modules (Shop Math, Blueprint Reading, Metrology & Quality Inspection, G Code for Mills, G Code for Lathes, CNC Mill Concepts & Hands-On, CNC Lathe Concepts & Hands-On — 80 hours total) will qualify for a MACWIC Level 2 Certification.

Classes are scheduled in central Massachusetts (Worcester) and have also been established in the northeast region (Billerica). Plans are also in place to launch classes in southeastern MA.
Applied Manufacturing Technology Certification Pathway

There is something in this package that works for every individual, both new hire and incumbent worker, and every manufacturer struggling to effectively develop a skilled workforce in a cost effective manner.

The reality of manufacturing is that it is a very diverse sector with broad, hard to define skills needs. However, there are core skills sets that have been identified by the Manufacturing Advancement Center Workforce Innovation Collaborative membership.

The Applied Manufacturing Technology Certification Pathway is an advanced manufacturing certification program that serves two main purposes. One is to add value and merit to the industry to encourage individuals to consider careers in advanced manufacturing. The second is to create a standard instruction set and evaluation process (which is continuously improved) so that employers readily understand the skill set of an applicant, therefore reducing the cost of hire.

This program is designed and influenced by industry leaders, implemented and monitored by an organization with a deep knowledge of the industry, and utilizes existing regional: vocational-technical high schools, community colleges, private and semi-private organizations to deliver training.
Three and a half years after the Great Recession officially ended, unemployment in the United States remains stubbornly high. Yet many employers still struggle to fill certain types of vacancies, especially for so-called middle-skill jobs—in computer technology, nursing, high-skill manufacturing, and other fields—that require postsecondary technical education and training and, in some cases, college math courses or degrees. Currently in the U.S., about 69 million people work in middle-skill jobs, representing roughly 48% of the labor force.

No aggregate estimate of the shortage of middle-skill workers exists, but the number is expected to grow substantially as more baby boomers retire. The problem is most acute in the utilities and aerospace sectors—50% to 60% of whose workforces are eligible to retire by 2020 or likely to leave for other reasons—but it affects other industries as well. Although the U.S. Bureau of Labor Statistics doesn’t publish estimates of job openings by skill category, combining government data on education and training requirements leads labor market experts to estimate that as many as 25 million, or 47%, of all new job openings from 2010 to 2020 will fall into the middle-skill range. (See the exhibit “The Middle-Skills Employment Landscape.”) Shortages of workers for these types of jobs are already undermining U.S. competitiveness and causing firms to shift their operations abroad. Figuring out how to train people to fill those well-paid jobs could help remedy the wage stagnation gripping the country and close the growing gap between high- and low-income households.

The big obstacle is execution. For the past three decades, U.S. businesses and government have focused on overhauling K–12 science, math, and reading education and on addressing persistently high dropout rates in inner cities (see “Rethinking School,” HBR March 2012). We certainly recognize the need for such reforms, but progress has been too slow to remedy the looming skills shortages.

With political gridlock and a focus on deficit reduction likely to continue in Congress, the federal government probably won’t launch major new education and training initiatives anytime soon. It’s more likely that Congress will cut already-limited job-training and other non-entitlement programs. This would extend the weakness in federal support for job training since 1995. Indeed, as the U.S. population has grown since then, funding on a per capita basis has sharply declined.
Why Good People Can't Get Jobs: Chasing After the 'Purple Squirrel'
Published: June 20, 2012 in Knowledge@Wharton

http://knowledge.wharton.upenn.edu/article.cfm?articleid=3027

Wharton management professor Peter Cappelli’s most recent book -- Why Good People Can't Get Jobs: The Skills Gap and What Companies Can Do About It -- has inspired a reaction from just about every group with a stake in today's workforce: employers, employees, recruiters, academics and media commentators. Cappelli debunks the oft-repeated argument from employers that applicants don't have the skills needed for today's jobs. Instead, he puts much of the blame on companies themselves -- including their lack of information about hiring and training costs -- and on computerized applicant tracking systems that can make it harder, not easier, to find qualified job candidates.

Staying Power II
September 2012

http://www.northeastern.edu/dukakiscenter/manufacturing-report-card-staying-power-ii-released/

The Dukakis Center released our latest report on the manufacturing sector in Massachusetts. Staying Power II is a follow-up study to our first study on the manufacturing sector conducted back in 2007. As with the first report, what our research found is that the manufacturing sector is more robust and resilient that is commonly perceived. Productivity continues to increase at a rate much faster than the rest of the economy. Manufacturing remains the sixth largest sector of the state’s economy and yet represents the second largest sector in terms of size of payroll.

Also, as we uncovered in 2007, we forecast that there will be over 100,000 job openings in the manufacturing sector over the next decade in Massachusetts based on the plans of firms to grow along with projected retirements in the workforce.

And yet we cannot take the positive news for granted. There remain a number of challenges, particularly the ability of firms to recruit skilled craftsmen and other critical positions. We need to do more to improve training in order to provide a sufficient workforce for the current and future needs of manufacturing. The Commonwealth’s Advanced Manufacturing Collaborative has engaged hundreds of industry leaders along with government and nonprofit leaders to address the set of most important challenges and opportunities facing the sector.
Locating American Manufacturing: Trends in the Geography of Production
May 2012, Brookings Institute
Susan Helper, Timothy Krueger, and Howard Wial

http://www.brookings.edu/research/reports/2012/05/09-locating-american-manufacturing-wial

Metropolitan Statistical Areas

Franklin County
Hampden County
Hampshire County

Worcester County

Norfolk, Plymouth,
Suffolk, Middlesex,
Essex Counties (MA)
Rockingham, Strafford
Counties (NH)

Manufacturing Jobs as a Percent of All Jobs
Worcester

Rank 15

<table>
<thead>
<tr>
<th>Manufacturing Jobs as a Percent of All Jobs</th>
<th>Percent of Manufacturing Jobs Classified as &quot;very high-tech&quot;</th>
<th>Percent of Manufacturing Jobs Classified as &quot;moderately high-tech&quot;</th>
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<tr>
<td>10.9%</td>
<td>23.3%</td>
<td>16.6%</td>
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</tbody>
</table>

Average Annual Wages | $66,898

Change in Jobs, Q1 2010 to Q4 2011 | 1.3%
Springfield

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<th>Category</th>
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Rank 38

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Boston

Rank 54

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<th>Percent of Manufacturing Jobs Classified as &quot;very high-tech&quot;</th>
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<td>40.4%</td>
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<td>Change in Jobs, Q1 2010 to Q4 2011</td>
<td>0.5%</td>
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Percent of Manufacturing Jobs Classified as "very high-tech"

- Worcester: 23.3%
- Springfield: 9.7%
- Boston: 40.4%

Percent of Manufacturing Jobs Classified as "moderately high-tech"

- Worcester: 16.6%
- Springfield: 14.0%
- Boston: 13.3%

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<th>Springfield</th>
<th>Boston</th>
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<td>$82,415</td>
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<tr>
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Taking the Next Step to Develop Manufacturing Skills

By Jack Healy, Director of Operations, MassMEP

Twenty five years ago, I had the opportunity to visit two Japanese automotive transplants located in Anna, Ohio and Lexington, Kentucky to study their very productive manufacturing methodologies. Both organizations have continued to evolve and they have been recognized for achieving productivity levels of at least 95% of those located in Japan. This has led to the conclusion that whatever the faults of the US educational system, on-the-job training can compensate for educational deficits.

What was not widely recognized was that both organizations, at that time, made a two-year college degree a prerequisite for employment throughout their plants. Possessing such an extensive skill base obviously made for a much easier development of their productive manufacturing cultures in each of their respective organizations.

As President of a Massachusetts manufacturing firm at that time, I viewed having such a prerequisite degree for my own firm of 250 employees something of a dream. Lacking an existing credentialed talent base or a supportive community college system, the manufacturing community, along with my own firm, were reduced to hiring "the willing," regardless of educational levels.
While we’ve made progress, the Massachusetts manufacturing community still has a ways to go. According to the recent findings in the *Staying Power II Report Card on Manufacturing in Massachusetts 2012* report, compiled by the Center for Urban and Regional Policy School, approximately 40% of our entire workforce has a high school or less education level.

"In 2005, 33 percent of the workforce had at least a BA; five years later, that number is 39 percent. Younger workers joining the industry are coming in with more education, taking the place of older retiring workers who were much less likely to have gone beyond high school."

This finding and the fact that high-technology enterprises, such as medical devices and navigational and electronic instruments, are growing sectors and require higher levels of education for their new hires have contributed to the increase in education. In addition, hiring for much of the basic unskilled manufacturing assembly jobs, once the core of manufacturing, has become relatively unimportant. Nearly one-sixth of team assemblers work for employment agencies, which furnish workers to other companies on an as needed basis*, and as such are not included in the state's manufacturing sector's employment numbers.

Massachusetts' ability to provide a large number of well-paying jobs for those with less than a 4-year college education is in decline but may accelerate with the growth of the state's Advanced Manufacturing sector. The current skills gap of hundreds of manufacturing positions going unfilled, coupled with continued demands for improved productivity, have brought approximately a quarter of the state's manufacturers to a level of awareness that they must now become personally involved with resolving this problem that is jeopardizing the growth of our industries.

The *Staying Power II Survey* asked the firms in the survey for their recommendations for "what they thought were the most important initiatives that might be undertaken by industry itself, by their own firms, and by the state."

The following recommendations were made (and percentage of respondents who thought that these recommendations were very important or extremely important). As stated in the survey,

1. Working with school or community college instructors to incorporate industry standards into curriculum — 30.3%
2. Creating a certificate in manufacturing technology — 27.5%
3. Serving a mentors/advisors at selected vocational schools or community colleges — 27.4%
4. Speaking to parent organizations/student groups about careers in manufacturing — 24.7%
5. Contributing machinery, tools, or other materials to schools — 21.0%
6. Exhibiting at education, career, and technology fairs — 19.7%
7. Instituting company sponsored educational scholarships — 14.2%
8. Hiring vocational/community college teachers to train your employees — 11.6%
The survey also found that at least a third of the respondents are not willing to become involved in any of the recommended programs that may address this problem, either because they believed that they were not useful or because they did not have the resources or time to participate. While this is a significant segment of the manufacturing community, we have seen that there is a general willingness of manufacturers within the state to collaboratively participate in addressing their industry’s skills gap. Thus was born the Manufacturing Advancement Center’s Workforce Innovation Collaborative (MACWIC).

MACWIC is an industry-led collaborative that in less than a year’s time has established an acceptable skills credentialing system and established an articulation agreement with Quinsigamond Community College. Quinsigamond is recognizing and supporting the applicability of the MACWIC skills standard as part of the school’s degreed program in Applied Manufacturing Technology. Many economists attribute the differences in productivity of countries to their labor and capital markets, which makes collaborations like the MACWIC essential to support the necessary development of productivity in our labor markets.
Manufacturing in Massachusetts Has Jobs
Next Generation Manufacturer Newsletter, August 2012

There are 485 open production positions in central MA
National media outlets have been reporting conflicting information about the state of US manufacturing. Some reports indicate that the rate of growth is slowing. Others indicate that manufacturing growth will outpace the general economy. Some see good news, others see indicators that we are entering another stagnant period.

One thing that has remained steady is the demand for skilled production workers. We have an aging workforce that is retiring in record numbers (10,000 per day nationally), rapidly changing technologies aimed at increasing productivity, and a broken pipeline that is unable to replace workers due to low enrollment in vocational programs.

In June 2012, the Manufacturing Advancement Center Workforce Innovation Collaborative (MACWIC) surveyed its member companies and asked them about projected job openings for 2013 and if the inability to find skilled workers was hampering their ability to grow. MACWIC companies are located throughout MA but are concentrated in the central MA/Worcester County area. Together they represent about 5.5% of the total MA manufacturing employment.

MACWIC members identified 485 anticipated openings for calendar year 2013. Most of these positions were for production level, shop floor jobs. Ninety-one (91%) percent of the respondents indicated that the reason they need to fill these positions was due all or in part to growth, not attrition.

Figure 1. The inability to fill shop floor positions will cost MA manufacturers $1.5 Billion in lost sales opportunities in 2013.

<table>
<thead>
<tr>
<th></th>
<th>MACWIC</th>
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<tr>
<td>Anticipated production open-</td>
<td>485</td>
<td>8,948</td>
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<tr>
<td>Cost of lost sales opportunities</td>
<td>$81 Million</td>
<td>$1.5 Billion</td>
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<tr>
<td>Number of manufacturing</td>
<td>47</td>
<td>7,485</td>
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<tr>
<td>Number of employees</td>
<td>14,048</td>
<td>258,900</td>
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</tbody>
</table>

Eighty-two (82%) of central Massachusetts manufacturers say that the inability to find skilled workers is inhibiting their growth strategy. (cont. pg 38)
Manufacturing in Massachusetts Has Jobs (continued)

Finding Solutions
The Manufacturing Advancement Center Workforce Innovation Collaborative is a dynamic alliance of next-generation companies that work in a concerted effort to identify workforce-related business needs and to drive solutions. The MACWIC’s 60+ members represent over 14,000 MA manufacturing employees and 8% of the state’s GSP.

As a founding member of the MACWIC, MassMEP is able to connect member companies with trained individuals that are available for hire. Several levels of training are available and there are currently two state and federally funded initiatives. Training participants receive MACWIC recognized credentials and may be eligible for community college credit.

New Hire Opportunities
Veterans Training
This course trains veterans in basic foundation skills enabling them to qualify for employment in the precision manufacturing sector, raise awareness, and encourage entry into manufacturing job opportunities. Ultimately, these basically trained individuals will be well positioned to enter the workforce as productive workers and will be prepared for a continuum of future technical training and on-going career opportunities.

Advanced CNC Skills Training
The multi-phased training program provides certification for each trainee as well as a clearly defined career path. This program provides well-qualified employees to manufacturers who are ready to hire them.

Program Content
- 80 hours of foundation level (MACWIC Level 2) manufacturing skills training
- 100 hours of advanced CNC skills training at Worcester Polytechnic Institute
- 40 hours of MasterCAM x6 at Worcester Technical High School
- 10 hours OSHA General Industry card
- Florida Institute of Technology Lean to Green Certification
- $10/hour for 18 weeks ($7,200/person) wage reimbursement to offset OJT costs

Call the MACWIC at 508-831-7020 for more info about new hire programs and assistance. Membership and credential information may be found at http://www.macwic.org.
Massachusetts Executive Office of Labor and Workforce Development
http://www.mass.gov/lwd/

For questions related to labor and workforce development, policies, workforce investment and other key issues:

One Ashburton Place
Suite 2112
Boston, MA 02108
Tel: 617-626-7122
Fax: 617-727-1090

Commonwealth Corporation
http://www.commcorp.org/

Commonwealth Corporation builds career pathways for youth and adults in Massachusetts to prepare for high demand jobs in the state’s knowledge and innovation economy. We work in partnership with business, labor, education, workforce and community-based organizations and government to carry out this mission.

We focus our work in a few priority areas: sector partnerships, youth and young adult pathway-sand regional workforce development capacity. These areas of focus each use our in-house research and evaluation and program development capacity to build a high performance system among workforce and education partners in every region of the state.

2 Oliver Street, 5th Floor
Boston, MA, 02109
Phone: 617.727.8158
Fax: 617.242.7660

One-Stop Career Centers
http://www.mass.gov/lwd/employment-services/career-services/career-center-services/

34 One-Stop Career Centers throughout the Commonwealth of Massachusetts form the foundation of the state’s delivery system for employment and training services for job seekers, employers, and their workers.
Massachusetts Department of Veterans’ Services  
http://www.mass.gov/veterans/

Massachusetts Executive Office of Housing and Economic Development  
http://www.mass.gov/hed/

Massachusetts Clean Energy Center  
http://www.masscec.com/  
Dedicated to accelerating the success of clean energy development and implementation—while creating high-quality jobs and long-term economic growth in Massachusetts.

55 Summer Street, 9th Floor Boston, MA 02110  
Phone: 617-315-9355 | Fax: 617-315-9356  
info@masscec.com

Massachusetts Executive Office of Elementary and Secondary Education  
http://www.doe.mass.edu/

Massachusetts Vocational-Technical High Schools  
http://www.doe.mass.edu/cte/  
(Attached file)

Massachusetts Community Colleges  
http://www.masscc.org/

Worcester Polytechnic Institute  
http://www.wpi.edu/  
Create and convey the latest science and engineering knowledge in ways that are most beneficial to society.
4-year Colleges  
http://www.massachusetts.edu/system/stcclinks.html - MA Public Higher Education  
http://www.masscolleges.org/ - Independent Colleges

National Institute of Standards and Technology  
www.nist.gov Part of the U.S. Department of Commerce, NIST is one of the nation's oldest physical science laboratories. Congress established the agency to remove a major handicap to U.S. industrial competitiveness at the time—a second-rate measurement infrastructure that lagged behind the capabilities of England, Germany, and other economic rivals. Today, NIST measurements support the smallest of technologies—nanoscale devices so tiny that tens of thousands can fit on the end of a single human hair—to the largest and most complex of human-made creations, from earthquake-resistant skyscrapers to wide-body jetliners to global communication networks.

Society of Manufacturing Engineers  
http://www.sme.org/  
The mission of SME is to acquire and distribute manufacturing knowledge among its members and the broader manufacturing community. Recognized globally as the premier source for manufacturing knowledge, education and networking.  
MA Chapters: http://www.sme.org/Tertiary.aspx?id=14436

Association for Manufacturing Excellence  
http://www.ame.org/  
North America's premier organization for the exchange of knowledge in Organizational Excellence through the implementation of techniques such as Lean Tools, Leadership, Lean Product Development. Lean Supply Chain and Lean Accounting.

3701 Algonquin Rd., Suite 225  
Rolling Meadows IL 60008-3127  
USA  
Tel: 224-232-5980  
Fax: 224-232-5981  
Email: info@ame.org
National Innovation Marketplace
http://innovationsupplychain.com/usa/

Helps Companies, Communities, Colleges & Citizen Inventors INCREASE Innovation Speed & DECREASE Risk by accelerating Innovation Supply Chain Connections

UMASS Innovation Institute
http://www.umii.umass.edu/

UMII is an important new channel at Massachusetts’ flagship public research university for industry-sponsored basic and applied research, collaborative partnerships, and technology translation to industry.
UMass Innovation Institute
University of Massachusetts Amherst
217 Arnold House
Amherst, MA 01003-9304
umii@umass.edu
(413) 577-8644

Corporate Value Metrics
http://www.corporatevalue.net/

Dedicated to helping you maximize the value of your business. Each week, we’ll bring you actionable ideas, tools, and insights, designed to help you maximize your business value. You can access instructional newsletters written by industry-leading specialists, webinars on timely topics, local seminars that will dive deeper into operational, financial, and strategic topics, and our flagship service – the Value Opportunity Profile™. We are committed to being your one-stop resource for maximizing corporate value.

4 Bellows Road
P.O. Box 167
Westborough, MA 01581
Office: 508-870-5805
Western Mass. National Tooling and Machining Association
http://www.wmntma.org/

Promote the precision manufacturing industry and foster an environment where member companies profit from involvement with the Association. Our work is focused on providing critical business intelligence to our members that will shape their strategy and help them master their chosen markets.

Boston Tooling and Machining Association
http://www.bostontooling.org/

Promote the precision custom manufacturing industry in the region and to provide our members with the services and information that will assist them in the successful operation of their businesses. Members located in Eastern Massachusetts, New Hampshire, and Maine.

Precision Machined Products Association
http://www.pmpa.org/

International trade association representing the interests of the precision machined products industry. While PMPA consists mainly of North America based manufacturers, its members also operate facilities in various industrial markets around the globe.

Advanced Manufacturing Collaborative

Center for Manufacturing Technology
http://www.customtrainingcenter.com/

Full service training facility specializing in Machine Shop Training. In addition to Machine Shop training our curriculum offers certificate based training and specialized programs.
30 Nashua Street

Woburn
MA 01801
Phone: 781.933.0049
Fax: 781.935.3904
Email: admissions@customgroupusa.com

MCDI
http://mcditraining.com/

Providing educational and vocational training opportunities and to offering supportive services that prepare individuals for personal growth and economic self-sufficiency.

Massachusetts Career Development Institute, Inc.
140 Wilbraham Avenue
Springfield, MA 01109
Phone: 413-781-5640 Ext. 270 or 230
Fax: 413-736-2452
Admissions@mcditraining.com
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Vocational Technical Schools with Machine Tool Technology

Assabet Valley Regional Vocational School * www.assabettech.com
Bay Path Regional Vocational Technical High School * www.baypath.tec.ma.us
Blackstone Valley Regional Vocational Technical High School * www.valleytech.k12.ma.us
Bristol-Plymouth Vocational Technical High School * www.bptech.org
Chicopee Comprehensive High School * www.chicopeeps.org/CCHS/index.cfm
Dighton-Rehoboth Regional High School * www.drregionalorg/dighton-dohobothhigh
Diman Regional Vocational Technical High School * www.dimanregional.org
Franklin County Technical School * www.fcts.org
Gloucester High School * www.gloucesterschools.com
Greater Lowell Technical High School * www.gltech.org
Greater New Bedford Vocational Technical High School * www.gnbvt.edu
Leominster Center for Technical Education * www.leominster.mec.edu/cte.htm
Montachusett Regional Vocational Technical School * www.montytech.net
Nashoba Valley Technical High School * www.nashobatech.net
North Shore Technical High School * www.nsths.net
McCann Regional Technical High School * www.mccanntech.org
Old Colony Regional Vocational Technical High School * www.oldcolony.us
Pathfinder Regional Vocational Technical High School * www.pathfindertech.org
Putnam Vocational Technical High School * www.sps.springfield.ma.us
Shawsheen Valley Technical High School * www.shawsheen.tec.ma.us
Smith Vocational and Agricultural High School * http://smith.tec.ma.us
Somerville High School * 617-625-6600
South Shore Regional Vocational Technical High School * www.ssvotech.org
Southeastern Regional Vocational Technical High School * www.sersd.org
Taconic High School * http://www2.pittsfield.net/groups/ths
Tantasqua Regional High School Technical Division * www.tantasqua.org
Westfield Vocational Technical High School * www.wvths.org
Whittier Regional Vocational Technical High School * www.whittier.mec.edu
William J. Dean Technical High School * www.hps.holyoke.ma.us/dean.htm
Worcester Technical High School * www.techhigh.us
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MA Workforce Board (WIB) Association Overview

The Massachusetts Workforce Board Association is a business-led organization that represents the members of Massachusetts’ 16 regional workforce boards, and provides leadership in developing a collective vision of the workforce development system in the Commonwealth. The Association’s members include employers, representatives of labor, higher education, business and industry associations, economic development and workforce organizations.

The Workforce Investment Boards (WIBs) of Massachusetts provide workforce development leadership in their communities. These business-lead WIBs have the critical role of governance and oversight of the federal and state resources that support the regional network of One-Stop Career Centers and education and training investments in their regions. Workforce Board membership consists of private-sector businesses working in concert with labor, education, and the public sector to design effective, demand driven workforce development services for job seekers and employers. To keep business competitive and to sustain economic growth, our 16 WIBs:

- Identify changing workforce needs as part of the regional economic development strategy
- Develop strategic responses to the labor market and industry
- Work to build a comprehensive workforce system in response to the demands of the marketplace, workplace, and workforce
- Focus on accountability, customer satisfaction, and measurable results.

From Massachusetts Workforce Board Association - www.massworkforce.com
# Massachusetts Workforce Board Directors

## Contact Info

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<th>Organization Name</th>
<th>Contact</th>
<th>Address</th>
<th>Phone</th>
<th>Email</th>
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</thead>
<tbody>
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Trident Machine Tools, Inc.
www.hfotrident.com

We are a full service distributor for Haas Automation, Inc., the largest machine tool builder in the United States. Haas Automation manufactures a full line of CNC vertical and horizontal machining centers, mini mills, super mini mills, CNC lathes, rotary tables and 5C indexers as well as toolroom products with the Toolroom Mill and Toolroom Lathe line. Haas machine tools and rotary products are built to deliver high accuracy, repeatability and durability. Since our founding in 1994, we have installed more than 3500 machine tools in New England.
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Society of Manufacturing Engineers
Student Chapter 25
We are a company led network made up of active employer participants working collaboratively to identify common issues and challenges and implement solutions relating to:

- Common business and workforce problems
- Best practices in sustaining talent and catalyzing talent pipelines

...allowing members to:

- Make positive and lasting impact on their businesses
- Participate in growing innovative member partnerships from the ground up
- Network with a broad range of businesses and industry leaders

Our continuing goals:

- To offer MACWIC membership a broad range of skills training options, coupled with a credentialing system and a defined career pathway mechanism to build skills beyond the entry level threshold
- To fill the pipeline of talent for the future generations of manufacturing operations.