The Herkimer-Madison-Oneida Workforce Development Board (WDB), in partnership with the NYS Department of Labor approached the Northeast Advanced Technological Education Center (NEATEC) to support them in a project that would examine the workforce needs of advanced manufacturing employers in the region.

NEATEC is a National Science Foundation funded project that partners with community colleges to develop/deploy curricula preparing students for advanced manufacturing technician positions throughout New York State and Western New England. NEATEC is sponsored by SUNY Polytechnic Institute, home to a NanoTech Complex hosting hundreds of companies engaged in research to support the growing semiconductor and semiconductor derivative industries. The project proposed by WDB complemented the mission of NEATEC by providing manufacturers’ feedback and skill set analysis in advance of curriculum development. This process ensures the relevancy of the content and success of the workforce trained.

February 28th Forum:
Manufacturers, Educational and Workforce Development providers from Oneida, Herkimer and Madison counties were invited to a forum on the SUNY Polytechnic Utica campus. A total of 70 people attended.

Participants were assigned to sit at assigned tables to ensure that there were representatives from manufacturing in each of the eight groups. Each group had a scribe who was responsible for recording the group’s discussion.

The facilitator Kate Alcott, Associate Director of NEATEC, read each of the 11 survey questions to the groups and allowed them five minutes to discuss. Educators and Workforce Development professionals were encouraged to listen to the manufacturers’ responses and not offer solutions during the discussion period.

Educational and Workforce Development professionals were asked to bring information about the current course offerings, workshops, certificate programs or initiatives that they offer. Those materials were on display in the meeting room. At the end of the Forum, participants were encouraged to talk to representatives about specific offerings. Business cards were exchanged, marketing materials were consumed and networking was observed.

Participants were told that a follow up, invitation only focus group would occur in the spring. A summary of the discussions from the eight groups was created and distributed to all attendees.
## Overview of Information Collected 2/28/17

<table>
<thead>
<tr>
<th>Manufacturing Partners:</th>
<th>Manufacturing Partners:</th>
<th>Educational Partners:</th>
<th>Workforce Development Partners:</th>
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<tr>
<td>Gold Medal Packing</td>
<td>Indium Corporation (3)</td>
<td>SUNY Poly (4)</td>
<td>Oneida Co. Workforce Dev.</td>
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<td>Empire Fiberglass</td>
<td>International Wire</td>
<td>MO BOCES (2)</td>
<td>Workforce Dev. Institute</td>
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<td>Group</td>
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<td>Revere Copper</td>
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<td>Cornell Coop Ext.</td>
<td>Working Solutions (7)</td>
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<td>Products</td>
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<td>Oneida &amp; Madison Counties</td>
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<td>Meyda Custom Lighting</td>
<td>Bartell Machinery</td>
<td>OHM BOCES (5)</td>
<td>Access VR (2)</td>
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<tr>
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<td>MGS Manufacturing</td>
<td>MVCC (4)</td>
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<td>BOCES Consortium</td>
<td>Herkimer County Industrial</td>
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<td>Brightwaters Farms</td>
<td>NY Wired for Education</td>
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<td>Titan Homes (2)</td>
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<td>Rome Free Academy</td>
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<td>AIM- Adv. Institute for</td>
<td>Manufacturing (5)</td>
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</tbody>
</table>

(#)= indicates number of representatives present

### Summary of Workforce Needs:

#### General Disciplines:
- Metallurgy
- Chemistry
- Mechanical Engineers
- Electrical Engineers
- Mechanics
- Machinists
- Draftsmen
- Information Technology
- Machine Operators-
  specifically for wire mfg.
- Tradesmen (all) HVAC,
  Plumbing, Welding, Tool & Die

#### Specific Skills:
- PLC training
- Basic Manufacturing Skills
- Safety Training
- Electrical concepts
- Auto CAD, Solid Works
- Basic mechanical concepts
- Blueprint reading
- Fine motor skills
- Reading comprehension
- Lean manufacturing
- Mechatronics

#### Soft Skills:
- Good work ethic
- Care about job-commitment, loyalty
- Show up to work-dependability
- Professionalism (especially during interview)
- Ability to communicate
- Leave phone alone!
- Positive attitude about work
- Respect for co-workers
- Leadership
- Critical thinking, problem solving, reasoning skills
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Applied math
A more detailed compilation of the groups’ responses to the questions can be found in Appendix A.

June 6th Follow up Forum:
A smaller group of predominantly educators was invited to come back to the SUNY Polytechnic campus to discuss the manufacturers’ workforce needs and to assess whether the region is currently supporting those needs. Four manufacturers, representing precision machining and semiconductor supply chain were also invited to inject the employers’ perspective into the conversation and to ensure that our analysis of needs was accurate.

With a few exceptions, the 24 attendees had attended the original gathering in February and had received/reviewed the summary of the manufacturers’ needs that had been emailed to them. We distributed a paper copy as a reminder of the survey results.

Apprenticeships:
The forum kicked off with a showing of a video from CNBC’s On the Money entitled “Fill the Gap,” referring to apprenticeships as one way to bridge the expanding manufacturing skills gap in the U.S. The video highlighted the resurgence of interest in using apprenticeship programs to fill positions. It referenced the Trump administration’s recent commitment to create 5 million apprenticeship positions over the next five years and cited a recent Commerce Department study that boasts a high ROI to employers, $1.50 return for every $1.00 spent on apprenticed workers.

Common Benefits of Apprenticeship\(^1\)

<table>
<thead>
<tr>
<th>Production</th>
<th>Workforce</th>
<th>Soft Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output during the apprenticeship at a reduced wage</td>
<td>Reduced turnover</td>
<td>Employee engagement and loyalty</td>
</tr>
<tr>
<td>Higher post-apprenticeship productivity relative to similarly tenured employees</td>
<td>Pipeline of skilled employees</td>
<td>Greater problem solving ability and adaptability</td>
</tr>
<tr>
<td>Reduction in mistakes or errors</td>
<td>Better matching of employee skills and character with employer needs and firm culture</td>
<td>Reduced need for supervision</td>
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<tr>
<td></td>
<td>Lower recruiting costs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Development of future managers</td>
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</tbody>
</table>

\(^1\) The Benefits and Costs of Apprenticeships: A Business Perspective, by Case Western Reserve and the Department of Commerce, November 2016.
Jennifer McCullough, Nate Crossett and Michael Briggs from the Workforce Development Board and Nicholas Gratch from the NYS Department of Labor spoke about their apprenticeship programs. Some of the manufacturers present had questions about the reporting and educational requirements. WDB is partnering with Tooling U-SME to provide the 144 hours/year of related training to apprentices. Apprentices can also attend local community colleges to fulfill this educational requirement.

Promoting Careers in Manufacturing:
There was a lengthy discussion about how to drive young people into apprenticeship programs and toward careers in manufacturing generally. Manufacturers in the room confirmed the “gray tsunami” that’s occurring in their workforces and recognize that the knowledge base will retire with these skilled, seasoned employees. Over the next eight years, nearly 3.5 million manufacturing jobs will be needed and it is expected that 2 million will go unfilled due to the skills gap.²

Some promotion suggestions:

- Support and promote programs like Pathways in Technology (P-Tech). Tiffany Piatkowski from Oneida-Herkimer-Madison Board of Cooperative Education Services (OHM BOCES) described her STEM focused program for high school freshman. This is an integrated high school and college curriculum where BOCES partners with Mohawk Valley Community College (MVCC) to provide students with an opportunity to obtain a high school and an accelerated associates degree within a four, five or six year period. Students can experience internships, job shadowing and mentorships with local manufacturers, tour facilities to see state of the art processes, participate in leadership, communication and problem solving skills, all while enrolled in P-Tech.

- Participate in Manufacturing Day celebration. For the past 4 years, SUNY Polytechnic has hosted an expo to shine a light on manufacturing opportunities in the State. In 2016, over 1100 middle/high school students attended from over 30 different schools. A suggestion was made to include parents in this year’s event, taking place on October 6, 2017, so they too can see the 50+ manufacturing exhibitors showcasing their products and processes. Educational partners and workforce development programs that support manufacturing careers are also invited to exhibit and share information. Having parents in attendance might reinforce the notion that today’s manufacturing jobs are not like the past.

² According to a Deloitte analysis done in 2015, based upon data from the U. S. Bureau of Labor Statistics and Gallup Survey.
Review of Workforce Needs:

- Metallurgy Chemistry- MVCC offers AS in Chemistry, SUNY Polytechnic offers chemistry and material science within their engineering programs.
- Mechanical Engineers- MVCC offers AS, SUNY Polytechnic offers Mechanical Engineering Technology and Mechanical Engineering BS degrees.
- PLC (Programmable Logic Controllers) - MVCC offers training within their Mechatronics Certificate Program.
- Certified Production Technician Training- MVCC offers a 12 week program
- Lean Manufacturing- Advanced Institute for Manufacturing (AIM), MVCC, Manufacturing Association of Central NY (MACNY), and SUNY Polytechnic offer various levels (belts).
- Trades (welding, HVAC, plumbing, drafting, electrician, carpentry, masonry) - MVCC offers a certificate, BOCES.
- Machinist- MVCC offers an assessment-based certificate in Machinist Technology.
- Electrical Engineering- MVCC offers an electrician technician certificate, AAS in electrical engineering technology. SUNY Polytechnic offers Electrical Engineering Technician and Electrical Engineering BS degrees.
- Safety Training- MVCC, Advanced Institute of Manufacturing (AIM) & SUNY Polytechnic
- Applied Math (measurements, computations, metric/standard conversions) - BOCES, MVCC, SUNY Polytechnic.

The group of educators concluded that there are courses and or programs offered in the Mohawk Valley for all of the workforce needs that were identified in the February forum. Some of the manufacturers in the room started to ask for more specific training for software used in their facility. For example, Mastercam was requested by a manufacturer who currently sends their employees to Rochester for training. Educators argued that although they might not teach that specific software, they teach something that is functionally analogous to it and once students learn the concepts from one program, that knowledge is easily transferred to another.

Equipment Used by Educators:

There was some concern raised about educators using equipment that is different from what the manufacturers are using. Dr. Andy Wolfe, Interim Dean College of Engineering at SUNY Polytechnic, spoke about the school’s new Center for Global Advanced Manufacturing (CGAM) laboratory facility that is currently under construction. It will house a host of 3D printers, a scanning electron microscope, a high end machine shop and other equipment that will be used to teach students analytical and diagnostic skills. The equipment selected is state of the art. It will be available for manufacturers to use for testing and prototyping. Although it may not be
the same equipment that a local manufacturer has on the floor, students who learn to use it can transfer those skills easily.

**Case Study-GlobalFoundries Equipment/Maintenance Technician (Appendix B)**

Participants were asked to review a job description for this position and consider if we, as educators currently provide all of the required training. This particular job was chosen because it is a good example of a high tech, non-engineering position that requires a two-year degree. There was considerable discussion about the depth of skill required for this “entry level” job. It reinforces the elevated need for training in high tech manufacturing.

**Soft Skills:**

Many observed all of the references to “soft skills” mentioned in the job description such as, ability to follow directions, work in groups, prioritize activities, train new team members, and learn new skills.

The manufacturers that we surveyed in February had a similar list of concerns regarding the emotional IQ of the employees that are applying for their jobs.

Tiffany Piatkowski from OHM P-TECH shared a list of activities she uses to develop soft skills in her students, for example:

- Mock interviews
- Team building exercises
- Communication activities
- Mentoring from industry leaders
-Reviewing phone etiquette

The group was confident that they could technically prepare a student for the GlobalFoundries job, but worried that the soft skill development would be more difficult. It is clear that educators need to identify better strategies, like Tiffany has, to prepare students for work in this highly technical, disciplined environment.
Conclusion/Database:
During both meetings, the manufacturers in the room expressed their surprise and frustration in learning, for the first time, about all of the technical programs offered in the Mohawk Valley. Although the courses, programs, and trainings are available, the manufacturers do not seem to be getting the message. Not only are these programs useful for training new employees, but manufacturers can also use outside training to promote existing employees who have increased their skill sets. This educational bounty can be accessed by going to each college, BOCES, AIM, MACNY website. Employers want a clearinghouse for this information that is simple to use.

Alice Savino, Director of WDB announced to the group that her agency will be developing a database of educational programs that will provide a consolidated resource for both educators and manufacturers to use. Michael Briggs from the WDB will be working with the Computer and Information Science Department at SUNY Polytechnic to create an online platform. The benefits of this database will be far reaching. By keeping a current, complete list of offerings, manufacturers in the region will have greater access to a workforce pipeline. Manufacturers considering a move to our region will have a clearer picture of our commitment to training their workforce.

This project illuminated the need to break down silos. Training a technical workforce for advanced manufacturing has to be a team effort. The more often we talk and listen to each other, the more prepared we will be to usher in the new workforce.
Q1) Survey respondents believe that the following manufacturing sectors are either growing or changing: Metals manufacturing, food processing, nanotechnology and advanced manufacturing
Are there other sectors you would add?
- Metallurgy Chemistry
- Micro Manufacturing
- Lab based, analytical packaging
- Woodworking

Q2) Survey respondents estimated that, in their companies, the greatest number of jobs over the next 2-3 years will be created in production, followed by support, then back office jobs, in that order.
Do you anticipate other growth areas? Please list:
- Specialty Production (Tool & Die)
- IT Support
- Marketing, Social Media
- Technical support to service machines
- Design & implementation

Q3) Over the next 2-3 years do you anticipate a shortage of qualified candidates? Generally, what are the qualifications of candidates you currently hire - High School diploma, Certificate or some other credential, Associate Degree, Bachelor’s Degree or advanced degree?
- Seeking four-year engineering degrees, applying for Machine Operator positions to get a foot in the door.
- Currently hires High School for shop, other jobs may look for degree but really education level not so important.
- Metals manufacturing industry has more of a focus on experience and application.
- Hire mid-level and train onsite or send for additional training, sometimes the experienced worker is preferred over a degree or certificate.
- High School Diploma/ some require knowledge of food safety able to be trainable.
  Company will nurture entry level, Populations that have had difficulty finding employment, would hire certificated students/IEP.
- Needs at least the TASC (GED).
- Getting many refugees applying for the food processing industry.
Some other credential (same as certificate)-10%, Bachelor’s Degree-5%(Testing Lab) 30% Pharmaceutical, High School Diploma-50-80%Pharmaceutical (Assembly), Advanced Degree 10% (Pharmaceutical).

High School Diploma. All manufacturers predominantly looking for individuals with High School diploma people with higher skills (e.g., Bachelor’s degree) last only short time.

Certificate, AS, BS, Don’t require advanced Degree, Have some training in Electrical through BOCES. Rather hire Machinist with skill.

A mix, but a need for more trained labor.

Q4) Do existing programs teach the skills you want your job candidates to have? Are there ways those skills can be taught that would better meet your needs?

- Need to find candidates that work with their hands, most young people love to work with hands but don’t pursue that trade.
- Think programs are there but confusion about where to go. Training programs are available but not always accessible due to production time loss, employment.
- Intern students are the students that aren’t seeking a career in manufacturing.
- Not enough “on the floor” Practical knowledge. Candidates have book knowledge and need to add application experience. “Teach a little, Do a little.”
- Discussed the difficulty of hiring a recent college grad who has no real world experience-Internship programs might be an answer- would need grant funding to alleviate staff/financial burden of training an intern.
- No general food safety training provided.
- No educational programs offered in this area, there is need in machine operation training.
- Start students earlier with solutions besides college.
- Engineering is taught, but lower end skills are lacking, Drafting, schematics, Auto Cad, Solid Works Mechanical Engineers sometimes have these, Electrical Engineers seldom have skill.

Q5) Manufacturers, please take the next ten minutes to tell the educators at your table, what you see as the biggest weakness in the applicant pool you are seeing now.

List:

- Mechanical Concepts
- Lack of ability to interact
- Professional skills
- Lack of preparation for interviews
- Knowledge about company
- Sense of entitlement
Leadership skills
Mechanical skills
Blueprint reading (customized)
Inspection hand held equipment (micrometers for example)
Machining basic concepts
Quality management systems & paperwork associated with it
Loyalty, commitment
Math –critical! Ex: Metrics vs. standard conversions (tape measure)
Reading comprehension
Trade skills- HVAC, electrical, auto, and plumbing
Fine motor skills
EDM- Electronic tool cutting
Better understanding of Apprenticeship programs

Q6) Manufacturers, do you provide in-house training now? If so, how extensive is it? Please describe:

- New hire orientation (confidentiality, quality safety marketing) Job shadowing for 2-8 months.
- Still searching for the best ways to pull workers along after initial orientation, need tactical experience with materials & then ability to adjust to environment.
- Orientation, gauge training-on demand or “On the Fly”.
- (AS90 100-Quality Standards), Indium (TS16949) HCCC- discussed OJT/ Indium does some partnering with refugee center, CTM- pays employees to attend classes. Indium does Dale Carnegie/APICS-Six Sigma.
- Metals-Design side (extensive) Production (informal training 6months) Pharma (Extensive training, 10/20/70 model) spending a lot of money on in-house increase of skill sets.
- OSHA.
- Respirator-recipients get certificate.
- Refresher math training.
- Technical Training.
- Crane.
- LEAN Training.
- Training Manager/ trainers signed off on each 90 days (Observe, Assist, and Provide).
- Production Trainer/mentor/testing, hands on.
- Floating-mentoring.
• Vendor Training-In house (State/Fed Funded).
• PLC, Auto CAD, Solid Works- 1 week classes/ FEA training.
• Safety.

Q7) Do you currently offer internship programs as a way to vet new employees? & Q8) Do you currently offer apprenticeship programs as a way to train employees?
Many local manufacturers reported success with internship programs resulting in many becoming full time employees or transitioning to apprenticeships. Some negatives or reasons for non-participation in internship programs are:
• Lack of personnel to supervise
• Limited financial resources
• Difficulty finding appropriate students
Many manufacturers felt they did not have sufficient information to understand the apprenticeship program and some were afraid to invite DOL into facilities-education needs to happen regarding apprenticeship programs. Employers may feel there is expense to apprenticeship.

Q9) Do you think the region needs new degree/certificate programs to meet your current and future needs? What are your suggestions?
• Programs exist but don’t draw/advertise, employers may not be aware of those that exist or what’s covered.
• Need more narrow/specialized skill and deeper training for example: Inspection tools - More certificates.
• General program for shop work- math, soft skills, safety, OSHA, DOH-possible 6 week program.
• *Basics of shop floor manufacturing, blueprint reading.
• Yes. Mechanical, Electrical 2 year degrees to begin production work in the Pharma Industry.
• College graduates having a basic understanding of LEAN manufacturing.
• Systems are probably already out there, the problem is there are no candidates - manufacturers need qualified candidates with the skill sets- can’t afford to train them after hiring.
• Mechanical/Electrical Engineering technologies, Trades.
• We need to tell manufacturers about the certificate programs to CTE (CareerTech).
• Career Ready Certificate.
• Need local students to be aware of relevant programs and job opportunities.
Parents are driving kids to college, need to push towards the Trades.

Controlled-environment agriculture.

Q10) many residents who have a college degree seek work in a field unrelated to their majors. In this region, do you see a need for more short-term training that could give applicants, lacking technical skills, the basics they need to be productive? Please describe that training:

- Basics in manufacturing
- Inspection instruments, trainers need to get into local companies to see what the product/processes/work is then train the workforce.
- Depends on job, don’t need people who are too free thinking or over educated- need to follow a pathway employer lays out (some over think and question why too much), also depends on size of company larger companies can hire more diversely qualified people.
- Co-op Programs, basic short term training in LEAN Manufacturing concepts, previous practical experience training.
- “Boot Camp” - Short term training- essential skills specific to the jobs.
- Students are lacking basic conversational skills, Indium brought in Dale Carnegie for summer interns.
- Technical- Applying the Math
- No obvious short term training program needs, but there is a need for critical thinking capability and problem solving skills.
- On the Job training is most important.

Q11) Is there a preference for either pre-hire training programs to increase the skills of the overall pool of applicants or on the job (OJT) training to train those already hired? The overwhelming answer is yes to both pre-hire training and on the job training.

There was also an overwhelming need noted for soft skills in communication and work behavior. Cell phones were cited as a problem along with lack of respect, enthusiasm and work ethic.
APPENDIX B

Job Description - GLOBALFOUNDRIES

Equipment / Maintenance Technician

Job Number: 17001173

Description

Summary of Role:
Equipment/Maintenance Technicians sustain and run the fab floor with primary responsibility of resolving equipment and process issues. Technician positions are shift positions working a compressed week of 12-hour shifts. GLOBALFOUNDRIES is a 24/7 manufacturing facility providing technician support across all shifts.

Essential Responsibilities:

- Monitor, control, and qualify state of the art 300mm semiconductor equipment
- Perform preventive and corrective maintenance activities
- React to error messages of factory systems and/or equipment
- Process wafers using defined procedures
- Review Statistical Process Control charts for process quality and react to Out of Control conditions including defect troubleshooting
- Perform visual inspections (quality check)
- Recover from process and tool interruptions
- Identify and address potential areas for improvement and optimize tool availability, cycle time, utilization and cost
- Complete all required reporting and documentation
- Understand and follow all health, safety, and environmental procedures
- Actively participate in continuous improvement processes, learning and skills development
- Strong team member, able to work well with a global team, train new team members as needed and other duties as assigned
- Perform all activities in a safe and responsible manner and support all Environmental, Health, Safety & Security requirements and programs.

Qualifications

Required Qualifications:
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- 2 Year Technical/Associates Degree in Science, Engineering, Semi-Conductor Manufacturing or a related discipline or equivalent military training/experience or 2+ years of equivalent experience

- Fluency in English Language – written & verbal

- Physical Capacity Demands -
  - Able to perform shift work on a 12-hour shift schedule; including working in a cleanroom environment per semi-conductor industry and GLOBALFOUNDRIES protocol/requirements
  - Able to wear all required clean room protective clothing and equipment throughout a 12 hour day (excluding breaks)
  - Able to lift a minimum of 30 pounds on a periodic basis throughout the shift (preventive maintenance) and/or process issues
  - Able to perform work in a standing position for majority of a 12 hour shift (excluding breaks)

Preferred Qualifications:

- Technical and Maintenance Skills with 5+ years direct experience performing Level 3 maintenance and troubleshooting on Screen CLEAN toolsets (SU3200, SU3100, SS3100, SS3200, FC3100)
- Strong technical skills and knowledge of semiconductor processing and process equipment
- Able to operate computer and system interface programs to ensure appropriate computing and analysis of production information
- Able to follow detailed instructions and procedures to complete tasks and required documentation; demonstrate solid work performance in an environment requiring high level of attention to detail and timeliness
- Strong team member, able to work well with a global team, train new team members as needed and other duties as assigned; able to handle multiple tasks simultaneously and prioritize activities
- Proficiency with software applications, Microsoft Office, as well as specific programs of SAP, MES, ASPECT; able to create reports and document procedures
- Working knowledge of Statistical Process Control methodologies & systems
- Equipment or process maintenance experience in semi-conductor manufacturing
- Familiarity with Lean processes & activities and Kaizen teams

Additional Eligibility Qualifications:
If you need a reasonable accommodation for any part of the employment process, please contact us by email at usaccommodations@globalfoundries.com and let us know the nature of your request and your contact information. Requests for accommodation will be considered on a case-by-case basis. Please note that only inquiries concerning a request for reasonable accommodation will be responded to from this email address.
An offer of employment with GLOBALFOUNDRIES is conditioned upon the successful completion of a background check and drug screen, as applicable and subject to applicable laws and regulations.

GLOBALFOUNDRIES is an Equal Opportunity/Affirmative Action employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, gender, sexual orientation, gender identity, national origin, disability, or protected Veteran status.

Manufacturing Workforce Needs and Development Assessment with special emphasis in creating a workforce pipeline

Prepared by: Barbara Ann Heegan, President & CEO The Otsego County Chamber of Commerce

Executive Summary: Overview
The Otsego County Chamber of Commerce facilitated a meeting on January 26, 2017 at the Foothills Performing Arts Center in Oneonta to discuss the needs of manufacturers in our area. The goal was to develop a roadmap to meet the educational and training needs for the next two to three years and to compile information to help design training programs and grant application to help reach regional needs. This conference was well attended with 50 area manufacturing leaders as well as educational partners. On Tuesday June 13, 2017, we met with area training providers that are offering existing programs to manufacturers.

Manufacturing workforce needs
The first question addressed was what are the sub-sectors within manufacturing that are growing/changing in workforce as we consider the next two to three years?

Manufacturers expect to see the greatest number of job openings for manufacturing technicians as technology was the most popular topic because it is constantly changing and developing. Programming, machine operation, computer skills, electronics, implementing new technology, data collection, effective sales and marketing, critical thinking are some of the
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employee skills set that are being sought to fill current and future positions. Some of the subsectors represented included the following: Machinery Manufacturing, Food Manufacturing, Pharmaceuticals, Bluestone, Forest Productions, Wood Manufacturing, Electronics, Printing and related support activities, Fabricated metal products, Packaging, Plastic and Rubber Products.

➢ The impact of an aging workforce and anticipated retirements over the next three years would have an impact for the need to recruit in the following areas: Skilled production (machinists, operators, craft workers, technicians) production support, Tool Makers, Production Managers, I.T, Lab Skills, Safety, Maintenance, Soft Skills, Microsoft Products, Welding, Human Recourses, Chemists, Quality Control, Industrial Electricians, Plant Engineering, Shift Leaders, PLC Programing industrial engineers, manufacturing engineers and planners.

Basic employability skills deficiencies among job candidates
➢ Skill deficiency noted among job candidates included the following: Inadequate basic employability skills (attendance, timeliness, work ethic), lack of basic technical training (industry certification or vocational training), inadequate math skills (percentages, metrics system, fractions), Inadequate problem-solving skills, lack of computer skills and lack of reading, writing and communication skills, leadership skills including how to be a team player.

Creating a Career Pipeline for Manufacturing
➢ During our group conversations with area manufacturers some key dialogue took place around defining what manufacturing is today as the term manufacturing seems too broad for people to understand what it means. Some perceptions of the industry is that it is boring assembly line work. This confusion of what the career options are within the manufacturing industry is not clearly defined. On that note, it was recommended across the board by industry leaders and educational partners to provide information about the industry as much as possible. It is recommended to engage students in 7th and 8th grade to provide information about the industry as much as possible. They want to know the day to day responsibilities and activities of the job, the salary, the training and education required. This information can be made available through an information hub on school websites, conversations with parents and distribute materials to students at career fairs and at guidance counselor offices.

➢ Build reciprocal relationships with local schools is key for career guidance of the manufacturing industry. If parents and students are provided with the tools and stories about the industry they can transfer knowledge to consider training and jobs that are here in Otsego County.

➢ The interest to work right out of high school and earn money to avoid college debt is attractive and brings us to training opportunities available or needed to support future advancement and education opportunities to receive this specialized training.
Area Manufacturers in Otsego County were eager to participate with area school to support the following activities to attract students to careers in advanced manufacturing. Facility tours, visit high school classrooms, internships, professional development for high school teachers, job shadowing, apprenticeships.

**Existing Training Opportunities in Region to Reduce Skills Gaps**

In meeting with the training providers, it was noted that in providing the list of training opportunities that they did not want to create hard boundaries as if these were the only trainings they would provide. All training providers have noted that they would work one on one with area manufactures to customize programs based on specific needs. Below are a few examples from training providers as a resource to our existing manufacturers.

**Training Provider Alliance for Manufacturing & Technology contact Lisa Rawcliffe (607) 206-7749**

The Alliance for Manufacturing & Technology shared that they most often identify needs by working closely with our clients to understand their current condition and future, then tailor a supportive approach that helps them meet their goals. While there is often a foundational structure to the training topic and presentation, we customize each delivery to best suit the company we are supporting. This assures content is relative to their condition and employees are more apt to relate to the skills and enhance job performance.

- **Supervisory Skills**
  - TWI methodology (Training Within Industry) – develop dynamic supervisors who will motivate staff to increase efficiencies and productivity. Empower supervisors through skills development in Job Relations, Job Instruction and Job Methods.
- **Basic Project Management** – full day session led by a Certified Project Management Professional
- **Continuous improvement methodology** –
  - Fundamentals of Lean
  - Value Stream Mapping
  - 5S
  - Quick Changeover/Setup Reduction
  - Standardized Work
  - TPM (total predictive/preventative maintenance)
  - Other topics as needed
- **Quality tools**
  - 8-step problem solving
  - FMEA (Failure Mode Effects Analysis)
  - DMAIC tools (Define, measure, analyze, improve and control)
  - Internal auditor training (ISO, AS, and other quality systems)
  - Defect reduction

Attached is an overview of The Alliance for Manufacturing and Technology for additional services
Training provider SUNY Delhi Misty Fields Assistant Director of Admissions 607-746-4546

Assistant Director of Admissions

Non-Credit Training Programs (These may be customized to meet the customer’s needs)

Electricity

Motors & Controls (Electrical Instrumentation)

Carpentry

Blueprint Reading

Welding

Automotive

Plumbing

Photovoltaic Installation

Refrigeration

Heating, Ventilation and Air Conditioning

Computer Applications (Microsoft Office, Quickbooks, etc.)

We also offer many courses through our online partner, Ed2Go. See http://www.ed2go.com/delhi/

Many courses are six weeks long and cost $95. The Career Training programs cover several months. All these are led by live instructors.

Training Provider Advanced Institute for Manufacturing Cory Albrecht Director, 315-624-9800 The Advanced Institute for Manufacturing (AIM) has a mission to provide small and medium sized manufacturers in the Mohawk Valley Region with training, consulting, and technology services that will lead to new product development, cost reductions, increased efficiency and profits. AIM is designated by NYSTAR and NIST as a Manufacturing Extension Partnership Center (MEP). MEP has 588 field locations throughout the United States and more than 1,200 technical field staff.

AIM offers the following programs and services in the six-county service area:

- Lean Manufacturing/Continuous Improvement
- ISO 9001:2015 QMS
- ISO/TS 16949 Automotive Industry Quality Management Systems
- AS9100 QMS
- Lean Six Sigma Certification
- OSHA Safety Training
- Training Within Industry (TWI)
MOHAWK VALLEY ADVANCED MANUFACTURING PLAN
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- Environmental Compliancy
- Safe Quality Food Level 1 & 2
- Hazard Analysis Critical Control Point (HACCP)
- Network & Cybersecurity
- Website Development
- Design Engineering/Prototyping
- CNC Training/Shop Math
- Customized Workforce Development Training

We also offer strategic business services that include:

- Strategic Planning
- Sales Planning
- Succession Planning
- Disaster Recovery Planning

AIM’s partnership with Fulton-Montgomery Community College, through its Center for Employer Services, offers programs to support manufacturing in areas such as, but not limited to:

- Leadership
- Management
- Supervision Training
- Microsoft Office Skills
- Sales & Customer Service Training
- Computer Applications
- Workplace Safety

Industrial Electrical Maintenance Support:

- Mechatronics
- Hydraulics
- Pneumatics

www.aim-mep.org
SME’s Tooling U Program with support of DCMO BOCES consultant Steven Palmatier

There is a program started at Corning based on an assessment of the needs in the plant. Once the assessment was completed DCMO BOCES and Steven Palmatier of Commerce Chenango explored the different online options they could use to provide online training combined with classroom labs. After looking at the websites of a number of providers and talking with them we settled on the SME’s Tooling U program which offered the largest number of courses at the best price point and included a robust administrative support package.

They chose 25 modules including basic math, algebra, geometry, trigonometry, reading mechanical drawings, mechanical inspection and courses related to thermoplastics and electrical maintenance. The students took 2 of these courses online each week with the average length of time required to complete a module being less than one hour and twenty minutes. The learning was reinforced with classroom labs where the employees could practice their skills with hands on use of tools and techniques, and plant tours to demonstrate how the class work related to operations in the facility.

Using the 600 Tooling U classes online we are building out the next “102” version of trade skills for Corning with an emphasis on drive trains, hydraulics and pneumatics and electric motors and controls. We will be teaching this in the fall along with “101” version in as somewhat shortened form.

Training Provider Otsego Northern Catskills BOCES Nick Savin District Superintendent

ONC BOCES Mechatronics/Robotics – Program Development Information

ONC BOCES component school districts have requested STEM programming to support the interests of their students in our diverse and competitive economy. Also, in numerous venues over the past three years Otsego County manufacturers, County of Otsego Industrial Development Agency (COIDA) / Otsego Now, Otsego County Chamber of Commerce and the component schools within the ONC BOCES have requested that we develop and offer an advanced manufacturing course to high school students. The skills gap in this area of workforce development has been cited as needing attention.

To address these requests, ONC BOCES is currently developing a mechatronics/robotics course to support area manufacturing. Should we be able to secure funding to build an instructional space, a mechatronics/robotics course will be offered as soon as September 2018.

This two-year program will encompass a broad range of knowledge, skills and experiences in the field of advanced manufacturing. Students will learn theory and application in the diverse aspects of mechatronics through class instruction, laboratory experiences, internships and career exploration, while also fulfilling requirements for high school graduation. Students will be expected to cross-train in existing CTE programs such as welding, information technologies, building trades, and/or engineering. Our goal is to develop student interest and aptitude to
provide a foundation of skill sets that can easily serve this broad field, as well as supporting further post-high school or college-level training.

To facilitate the success of a Mechatronic/Robotics program, ONC BOCES has established collaborative relationships with relevant industry partners. They have provided input into curriculum, application skills, lab experiences, internships and professional training. Higher education partners will provide articulation agreements and college credit where appropriate, as well as a bridge between high school and post-high school training. Collaborative relationships include:

1. **College Partners**: SUNY Delhi and Hudson Valley Community College (HVCC) currently have mechatronics programs leading to degrees. They have been providing curriculum and program assistance. SUNY Broome is a partner and is currently in the development stages of offering a mechatronics program. College credit agreements are currently being discussed. SUNY Oneonta, Syracuse University and SUNY Cobleskill are current partners providing physics, calculus and college English courses/credits respectively to our high school students.

2. **Lehigh Technical Center (LTC), Lehigh PA** – LTC has an established mechatronics program. They work with and supply a workforce for Hershey, Bausch and Lomb, and Nestle. They work collaboratively with Carbon County Community College and their mechatronics program. They have been providing advice, guidance and curriculum support as we develop our program.

3. **Industry Supplier Partner** – Allegany Educational Systems has been an important partner, providing advice on equipment that supports advanced manufacturing instruction. This company has been very important in the establishment and support of the Lehigh Technical Center advanced manufacturing program.

4. **Industry/Business Partners**: ONC BOCES has numerous industry/business partners that support each of our CTE programs. Specific partners for mechatronics/robotics include Astrocom, Mallinckrodt, Chobani, Unisom and Cooperstown Bat Company.

SUNY Delhi and HVCC are experiencing great demand for their Mechatronics graduates, with nearly all having jobs waiting upon graduation. Implementation of a BOCES secondary program in mechatronics/robotics will prepare students for success, whether moving immediately into the workforce or pursuing post-high school training. While STEM related curricula exists in all CTE programs, neither ONC BOCES nor our surrounding BOCES offer a dedicated program in advanced manufacturing.

A mechatronics program will require significant space. The application aspect of this coursework requires that “assembly line” structures remain over long periods of time.
In closing, many manufacturers are working on trying to reduce the skills gaps by providing internal employee training and development programs, seeking external and certification programs, and outsourcing some of the functions. It was agreed collectively by the collaborative partners to prioritize communication efforts to make sure that students and displaced workers know of the opportunities in Manufacturing by sharing the information with educators. If the educators share the information, they are part of the solution to create action. During the focus group across the board in each of the manufacturing companies, they shared they each have 2-3 current openings for entry level positions to professional engineers. That is an estimate of 150 job openings that need to be filled in our area. Each of the manufacturers expressed they are experiencing growth and plan to add jobs. Over the net 2-3 years due to planned retirements and sector growth, there is a potential of having 300 job openings. Therefore, the need for a skilled workforce in the areas described in this summary are in high demand.

Mohawk Valley Advanced Manufacturing
Fulton, Montgomery, and Schoharie Counties

The purpose of the Mohawk Valley Advanced Manufacturing Development Project was to develop solutions to education and training needs for Advanced Manufacturing businesses that would ensure maximum growth of those businesses. The process was designed to ensure that employers played a lead role in helping the workforce system and its training providers in designing, developing, and implementing programs that will meet emerging and anticipated needs. Since most of the Advanced Manufacturing concerns in Fulton, Montgomery, and Schoharie Counties can be defined as small businesses, it was important that the decisions regarding the identification of training needs and the solutions be driven by small businesses.

The Small Business and Enterprise Council groups companies as: small (less than 100 employees) medium (100 to 500 employees) and large (500 +). The federal government defines small as fewer than 500 (making 99% of all businesses in the US defined as “small”)

The activities of the FMS WDB project included:

- Identifying small and medium advanced manufacturing businesses and related industries such as Distribution Centers in the three-county area;
• Identifying other stakeholders including FMS Workforce Development Board Members, Chief Local Elected Officials, training institutions, chambers of commerce, community based organizations, organized labor, and technical education;
• Promoting the project to a larger community audience;
• Convening stakeholders;
• Sharing best practices;
• Tapping expertise of training providers;
• Developing solutions;
• Developing a plan of action;

Methods used to collect information:

• January 26: a 2-hour information session and interactive workshop to inform community stakeholders, businesses, and training providers about the project, including expectations for the project. The meeting also included an initial identification of employer needs and training provider offerings. Community stakeholders included economic development, county government, FMS WDB Board Members, and community action organizations.
• March 3, 2017: a 2-hour follow up meeting to review and combine related needs, prioritize employer needs, expertise needed, expertise available and from whom.

Identifying Business Needs: In the initial meeting on January 26, a flip chart activity was used to identify the weaknesses of current job applicants, the challenges of current employers, education and training requirements, training required from training providers, and what’s needed from Workforce Boards. These were not ranked in any way, but were gathered in round-robin format with a discussion at the end of each activity: "Greatest Weaknesses of Current Applicants", "Greatest Challenges of Current Employers", "Education and Training Requirements", "Needed from Training Providers" and "Needed from Workforce Boards". A list was then distributed to all participants for review prior to the follow-up meeting.

The follow-up meeting was held on March 3, with the intent of prioritizing the needs, from the perspective of the employer, as well as the ability to meet those needs, from the perspective of the training providers. The results of the previous meeting, by category, were prioritized by dot voting. Dots were color coordinated by employers and training providers. Each employer representative could use any or all of their dots on any given need. Training providers could also use their dots in the same way. Many employers used all of their dots on one or two items that they felt were most important to them. Training providers did the same with their dots. One of the most telling points that came out of this is that what employers felt were their greatest needs were not always what training providers had to offer. In another activity, there
was a facilitated discussion about "What Employers Need" and "What the WDB Can Provide." A chart is attached to this report.

**Identifying Best Practices/Success Stories that Could be Replicated under a Sector Strategies Approach:**

The Hamilton-Fulton-Montgomery BOCES and Fulton-Montgomery Community College sponsors two HFM PTECH Early College High School Programs in our area. One focuses on Advanced Manufacturing and FMS is very fortunate that this program has strong ties to members of our manufacturing community. Not quite two years ago, our HFM PTECH Early College High School Program students and teacher worked with a local manufacturer to develop an online repair manual and a phone app for employees. In the past, all of this knowledge resided in the “head” of one employee. If that employee was not in the plant, no repairs could be made to machinery. Now, through use of an app on the employee’s phone, there is a repair manual in “hand” instead of just someone’s head.

Without this program, the potential skills of these students would have gone basically untapped, and the needs of a local employer would have continued unmet.

The Fulton, Montgomery, and Schoharie Counties Workforce Development Board, Inc. as grant recipient and fiscal agent for a 4-Workforce Board partnership was recipient of a USDOL Workforce Innovation Grant "Steps up to STEM." The intent of the grant was to demonstrate the ability to build a career path within a specific business through a combination of activities such as Pre-Hire Classroom Training, On-the-Job Training, and Customized Training. A contract is written with an employer to defray part of the cost of wages or training while the employer agreed to upgrades and wage increases at the successful completion of each step. One success story follows:

A three-step participant was working at a textile mill as a machine and building maintenance worker, where he had serviced machinery and assisted in maintaining the building and grounds for five years. Due to the loss of an experienced, long term technician, the participant had an opportunity to advance into a machine technician position through the upgrade On-the-Job Training program. He received a raise with the promotion. His training included: installing production machines and the plant facility’s equipment, basic machinist duties and operation, machinery mechanical and electrical repairs, pneumatic and hydraulic repairs and installation, reading and interpreting equipment manuals and work orders, troubleshooting and diagnosing problems, plumbing maintenance, use of electric meters, and detection of faulty machinery/manufacturing operations and reporting issues to the supervisor.

Steps 2 and 3 consisted of customized training where the participant attended the local community college and completed 2 courses per semester: Industrial Automation and Robotics 1 and Industrial Automation and Robotics 2. The first course studied the theory and operation of devices and systems
that are used in industrial controls, including the fundamentals and applications of automation and robotics. He was trained to troubleshoot and repair systems that contain devices such as photoelectric sensors, inductive and capacitive proximity sensors, timing circuits, relays, pneumatic and hydraulic solenoids, and basic controls. The second course (Step 3) involved the study of sensors and actuators by studying the theory, programming and operation of devices and systems that are used in industrial controls, including closed loop control, PID (proportional–integral–derivative) controller, PLC’s (programmable logic controllers) using ladder logic, robotics, HMI’s (human machine interface), and SCADA (supervisory control and data acquisition) systems. It also included DC and AC motor controls, servo systems, and coordinated motion control systems. The trainee found it very helpful and exciting to attend classes and then return to work and actually practice what he learned.

He received an additional raise upon completion of each course. He continues to work for this employer. There is an unmet demand in our area for maintenance technicians with the ability to work with automated and robotic equipment in our region making these skills all the more valuable. In this case, the employer was able to keep a valuable employee and by promoting from within, built employee loyalty.

This multi-step training concept is most telling in light of the activity “Greatest Challenges of Current Employers” were one employer revealed that he was reluctant to promote from within because of the concern that if he promoted a good employee from within, he was losing them in a spot that he was already confident of their abilities. He preferred to hire from outside, but that was not promoting employee loyalty and employees were more apt to look for jobs elsewhere.

**Tapping into the Expertise of Training Providers:**

We reached out to our HFM PTECH Early College Program regarding three projects that were suggested by business partners:

- A video on preparing for interviewing,
- A video on Careers in Advanced Manufacturing, and
- Presentations to elementary and middle school students about STEM and Advanced Manufacturing.

They are in the process of considering which of these projects to pursue.

SUNY Cobleskill, Fulton-Montgomery Community College, and the Workforce Development Institute all indicated a willingness to take current offerings and make them more business friendly as well as to develop short term training to meet business needs.
Workforce Development Needs
Mohawk Valley Food & Beverage Manufacturing Sector
Findings from Regional Roundtable Discussions

Executive Summary

As part of a grant-funded Workforce Development Board effort to better understand manufacturing workforce development needs across a nine-county area in New York’s Mohawk Valley, food and beverage processors were invited to participate in “roundtable discussion” sessions held in Cobleskill, NY and Rome, NY in the spring of 2017. Follow-up discussions were held with several processors via phone. Participating processors ranged from a large co-packing entity with a coast-to-coast clientele radius to small sole proprietor food companies with NY 20-C Commercial Kitchen licensures. Key themes that emerged from these discussions include:

- Because of higher demand from direct-to-consumer, wholesale or contract packing clients/venues, food and beverage processors in the region are expanding and as a result will require additional employees over a five-year planning horizon
  - Expansion plans typically include both growth in operation scale and product/service diversity
  - Food and beverage manufacturers forecast equally significant growth in “downstream” employment opportunities including those with specialty retailers, restaurants, wholesalers and agro-tourism operations
  - Larger operations rely heavily on “temp agencies” for new employees
- Perceptions among educated working-age populations about the menial and potentially manual nature of food/beverage processing jobs often results in less-than-adequate applicant pools
- Business owners and managers lack leadership/management know-how to motivate workers to optimal performance and to adequately address human resource-related problems/conflicts in the workplace
  - Small business owners face time and resource constraints for adequate management/leadership training and may be too “possessive” with their businesses to give employees the flexibility or independence to grow professionally and contribute meaningfully to improving operations
- Business owners and managers cite “soft skills” and professionalism as the primary deficits in job applicants or current employees and the most pressing need for workforce development; specific “soft skills” programming needs include:
  - Professional communication/interaction in the workplace
  - Work ethic and responsibility
Customer service

While food and beverage manufacturers provide on-the-job technical skills training and are willing to hire candidates without pre-existing technical know-how, most expressed keen interest in hiring workers with technical credentials in:

- Food safety and sanitation (HACCP or GMP certification, for example)
- Process engineering
- Workplace safety
- Back-office management/organization
- Inventory management
- Management software/Record Keeping applications (such as Excel or QuickBooks)
- E-marketing and website development

- Food and beverage manufacturers largely expressed willingness and capacity to provide additional compensation to current or would-be employees with relevant technical training

- Small and medium-scale food and beverage manufacturers cite inability to pay for external employee training opportunities and consider the risk of newly-trained employees leaving the business as significant

- Expansion of already large processing/co-packing systems naturally means enhanced automation, a lower worker-to-fixed-capital ratio and often more significant regulatory hurdles; in addition, automation demands more advanced worker skills

- Existing employees, especially those 45 and older, often struggle to adapt to changes in technological or regulatory parameters in the workplace

Advanced Institute for Manufacturing
At Mohawk Valley Community College

Mohawk Valley Inventory of Sector-Based Workforce Strategies

Plan: Based on the guidelines in the Inventory of Sector-Based Workforce Strategies 2016, we surveyed advanced metals manufacturers in a seven-county region including: Herkimer, Oneida, Schoharie, Otsego, Madison, Fulton and Montgomery. The survey questions are contained in this report. Our goal was to determine, based on the survey responses, what workforce training is needed in this seven-county region and how to proceed from that point forward.

Survey participants: We identified approximately 65 precision metals manufacturers in the region and sent them the survey.

Survey Responses: Approximately 13% of the manufacturers completed the survey. Most questions allowed for more than one selection.

Survey Questions and Responses:

1. How many employees do you currently have?
2. Over the next 2-3 years, how many new employees do you anticipate hiring?
   0-10: 80% of responders
   11-50: 20% of responders

3. List the top three industries that you serve.
   The following industries were listed by survey takers:
   Aviation, Space, Transportation, Power Generation, Oil and Gas, Energy, Mining
   Fabrication, Construction, Design/Build Manufacturing, Pump Components
   Broadband RF Communications, Restaurant Supply, Firearm, Wire and Cable, Lawn and Garden,
   Home Users, Tire

4. Sales Projection Growth for the next 2-3 years
   1%-10%: 50% of responders
   11%-25%: 20% of responders
   25%+: 20% of responders
   Stay the same: 10% of responders

5. To what do you attribute the growth? (Multiple Answer)
   Expanded Service Area - 55%
   New Products or Services - 55%
   Technological Advantage - 22%
   Other answers included:
   Investment in new equipment and machinery
   Stated lack of competition or economic changes

6. Over the next 2-3 years, in what areas do you see the greatest need for jobs? (Multiple Answer)
   Production: 90%
   Design and Implementation: 40%
   Technical Support to Service Machines: 30%
   Specialty Production (Tool and Die): 30%
   Other Answers included:
   Qualified Machinists
   Welders
   CNC Machinists

7. What qualifications will you be looking for in future employees? (Multiple Answer)
   4 Year Degree or Higher: 30%
   2 Year Degree or Certificate: 30%
   Prior Experience: 90%
   High School Diploma/GED: 40%
   Prefer OTJ Training to Degree: 50%
   Career and Technical School Certification (BOCES): 80%
8. What training or education programs would prepare prospective or current employees to meet your needs? (Multiple Answer)
   - Machine Operation Training: 100%
   - Inspection Tools/Math Skills: 90%
   - Shop Floor Basics: 90%
   - Apprenticeships/Internships/Co-Op: 60%
   - Drafting/Schematics/Blueprint Reading: 60%
   - LEAN Manufacturing/QMS: 60%
   - Engineering Software: 50%
   - OSHA Training: 50%
   - Mechanical/Electrical Engineering Technologies: 50%
   - Information Technology/Cybersecurity: 20%
   Other Answers Included:
   - Welding

9. What do you see are the biggest weaknesses in the present applicant pool? (Multiple Answer)
   - Work Ethic: 90%
   - Mechanical and Machining Concepts: 70%
   - Blueprint Reading: 60%
   - Reading Comprehension/Math Skills: 50%
   - Soft Skills: 40%
   - Leadership Skills: 30%
   - Trade Skills: 20%
   - Lack of Interview Preparation: 20%
10. What sort of in-house training do you currently provide? (Multiple Answer)
   New Hire Orientation: 70%
   OSHA/Safety Training: 70%
   Technical Training: 70%
   Floating/Mentoring: 40%
   LEAN Training: 30%
   Vendor Training: 10%
   PLC, AutoCad, SolidWorks In-House: 10%
   Boot Camp, Short Term, Specific: 10%

11. Which Training Method Do You Prefer?
   On-The-Job Training: 20%
   Pre-Hire Training: 10%
   Combination Of The Two: 70%

12. How do you recruit new hires? (Multiple Answer)
   Word of Mouth: 90%
   Job Finder Websites: 70%
   Newspaper Ads: 40%
   Job Fairs: 30%
   College Recruitment: 20%
   Headhunter: 20%
   Other Answers Included:
   Temp Services

13. What skills do your employees need to advance to the next level of competency within your company? (Multiple Answer)
   Cross-Training: 90%
   General OTJ Training: 80%
   Additional Industry-Specific Certifications: 30%
   Additional Education: 10%

14. On a scale of 1 – 5, how would you rate soft skills (communication skills, work ethic, enthusiasm, people skills, respectfulness, etc.)
   5 – Absolutely Important: 80%
   3 – May Be Important: 20%

General Comments:

“We have found Millennial’s work ethic and attendance to be lacking.”
“We need employees with eye hand coordination. Also, CNC lathe operators and programmers.”
“There is a need to better inform schools and parents that there are good jobs in manufacturing”
“There is a need to raise the integrity of jobs in manufacturing”
Conclusions:
The companies surveyed represent the typical size with less than 50 employees. All are planning to hire more employees and most are expecting increased sales. The biggest demand for workers will be in production jobs with machine operator level skills. Prior experience is the most valued qualification and although there will be some need for college degrees, the lack of a high school diploma or equivalency does not present a barrier for employment. Training needs are highest in operator, shop math and shop floor basics which correspond with the demand for operator level workers. Work ethic tops the list of biggest weaknesses of the applicant pool with mechanical and blueprint reading also rated as lacking. New hire, OSHA, and technical training is offered internally by the companies. Recruitment is diversified in approach.

Observations:

**Production/Machine Operation/Shop Floor Basics:** Prospective employees need to be familiar with machine operation, use of measuring tools, blueprint reading, and machine technologies. In a majority of cases, prior experience is preferred over a college degree. Technical certificates or industry-specific certificates with hands-on training are more valuable to the employers and will enable new employees to more quickly adapt to the environment. We need to design short-term training programs that will give prospective employees real-time, hands-on-experience so that they can get into the job market faster and be more productive faster.

**Apprenticeships/Internships:** Programs should be made available but at no cost to the employer. We need to identify funding that will place prospective employees into positions where they will be learning real world skills in real factory environments, not classrooms.

**Soft Skills:** This is a very important component of the employee training process. Work ethic, communication skills, cell phone use, basic courtesy, all these areas need to be communicated clearly to prospective employees so that they will be able to assimilate into the work environment. The high importance of soft skills is indicated; however, a breakdown of specific soft skills required may shed more light on the issue of work ethic and other needs especially if more information can be obtained about skills such as problem solving and critical thinking.

**Limited Education Concerns:** If a high school diploma or equivalency is not required, the basic shop math and blue print reading is essential and could be a barrier for employment. We have identified a possible correlation between not finishing high school and not learning the basic work ethics that employers in the region are requiring. An employee who has limited education, may require remedial level training for job entry and on the job training as it relates to math and reading.
## Sector Strategies Meeting

### March 3, 2017

### Greatest Weaknesses of Current Applicants

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<tr>
<th>From the Perspective of Employers</th>
<th>Training and other Assistance that Organizations May Provide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft skills and work ethic</td>
<td>Technical skills</td>
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<tr>
<td>Technical skills</td>
<td>Initial interview expectations</td>
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<tr>
<td>Breaking cycles of UI and PA</td>
<td>Job Seeking, Soft skills and Work Ethic</td>
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<tr>
<td>Cultural</td>
<td>Basic Computer Skills</td>
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<td>Aging population</td>
<td>Assistance with Recruiting Younger Workers</td>
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<td>Multigenerational</td>
<td>Understanding a Multi-Generational Workforce</td>
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<td>Initial interview expectations</td>
<td>Transportation Assistance</td>
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<td>Lack of basic computer skills</td>
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### Greatest Challenges Faced by Employers

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<tr>
<th>From the Perspective of Employers</th>
<th>Training that Organizations Provide</th>
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<tbody>
<tr>
<td>Personal/social issues</td>
<td>Don’t promote because difficult to replace</td>
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<td>Needing to replace older/retiring workers</td>
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<tr>
<td>Lack of succession planning</td>
<td>Supervisory training</td>
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<tr>
<td>Unions fear change/limit employers</td>
<td>Soft Skills (Inc. personal/social Issues)</td>
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<td>Leadership/management changes</td>
<td>Succession Planning</td>
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<tr>
<td>Multigenerational workers</td>
<td>Supervising a Multigenerational Workforce</td>
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<td>Lack of supervisory training</td>
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### What is Needed from Training Providers

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<tr>
<td>Image of manufacturing as a career</td>
<td>Soft Skills (Inc. Realistic Expectations)</td>
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<tr>
<td>Hands-on Training</td>
<td>Pipeline of Younger Workers</td>
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<td>Educating jobseekers on realistic expectations</td>
<td>Presenting Manufacturing as a Career</td>
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<td>CNC Training Program</td>
<td>Hands-on Training</td>
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<td>Basic computer skills</td>
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<td>Affordable, On-Demand Programs for Transitioning Adults</td>
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<td>CNC Training Program</td>
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Appendices
MOHAWK VALLEY ADVANCED MANUFACTURING PLAN
Appendices

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<tr>
<th>What is Needed from Workforce Boards</th>
<th>What Employers Need</th>
<th>What the WDB can Provide</th>
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<tbody>
<tr>
<td>Bringing multiple businesses together for training</td>
<td>Access to funding for customized training for current employees</td>
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<td>Funding for customized training for current employees</td>
<td>Bringing multiple businesses together for training</td>
<td></td>
</tr>
<tr>
<td>Recruitments with match and pre-screening</td>
<td>Recruitments with pre-screening and match</td>
<td></td>
</tr>
<tr>
<td>Pipeline of younger workers</td>
<td>Sequential training</td>
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<tr>
<td>Pipeline of younger workers</td>
<td>Lunch and learn sessions</td>
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<td></td>
<td>Identify common technologies</td>
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</tbody>
</table>

**QUESTION 1**

Survey respondents believe that the following manufacturing sectors are either growing or changing: Metals manufacturing, food processing, nanotechnology and advanced manufacturing
Do you agree? ____YES____ (yes/no)

*Are there other sectors you would add?*

*(Table 1)* Indium Corp, NY Wired, River Hawk,
Indium- Metallurgy Chemistry needed, growing; Seeing Entry level Operators, mechanics

River hawk – Machine tools steady, shaky the last 4 years, need those who understand the technology of making things available workforce = hired, left area, aging out.

*Food Production- Some, Nano –Questionable, Advanced Manufacturing – definitely

*(Table 2)* Riverhawk, Hartman Enterprises, Advanced Tool

Metals Manufacturing- Supply chain

Nano- Supply stream for industry

*Support Service for Metals Manufacturers*, big changes in Machine Technology
(Table 3) CTM, Indium Corp

CTM- sees Nano Slowing down And Growth in Metals manufacturing, Food Processing, and advanced manufacturing. Manufacturers concerned about employees retiring and a lack of qualified entry employees to back fill.

*Specialty Metals Manufacturing- # of Manufacturers bringing processes back into the country, Indium anticipates growth in Nano as everything is getting smaller. Both agreed that their definition of Nano is to see things get smaller, not necessarily true “Nano”

(Table 4) RiverHawk, Mallinckrodt Pharmaceuticals, Chobani

Advanced machinery, automation in the metals industry

*Micro-manufacturing is a step prior to Nanotechnology, it is happening right now and the skills to support this needs to be addressed.

(Table 5) MGS Wire/Cable, AIM, F.X. Matt Brewery

MGS- Mechanical Engineers, Electrical Engineers, Draftsmen, Trades, Aging Workforce, can’t fill positions. In Food Processing skill set demands are changing and industry is not growing.

*Add Machinery Manufacturing, Machinery Automation, skill sets in all Manufacturing areas is changing, evolving.

(Table 6) Indium Corp, Hartman Enterprises, Revere Copper Products

Revere Copper Products-is seeing growth/dropped brass/metal manufacturing is growing

Indium Corp-These fields are growing; Changes- applied math needs to be enforced, computers now doing some of the tool making, new hires are seeing, reading and met comprehension?

*Primary manufacturing/ Oneida is seeing growth

(Table 7) Advanced Tool, Sturges Manufacturing, Gehring Tricot Corp
Sturges-Webbing making-60%, Sutico- Delaware County, Titan Home-Manufacturing

*Pharmaceutical Manufacturing- Lab Base, Packaging, Analytical

(Table 8) Empire Fiberglass Products, Inc., Titan Homes, International Wire

Empire Fiberglass Products- the Fiberglass field has expanded & advanced in materials used. A production method hasn’t changed but technology behind it has.

*High School education is predominant requirement, but need advanced skill sets such as CAD, and still need production workers, individuals with good work ethic (Machinist, basic trade skills, Maintenance Mechanics, basic math skills)

(Table 9) Bartell Machinery

Bartell Machinery-Tire, Wire, Oil and gas

*Need people to support Electrical/Mechanical Engineers, Machinist, Assembly; Replace retiring-finding Engineers to come to area is tough, need PLC training.

(Table 10) Falvo Manufacturing, Brightwater Farms LLC, Riverhawk Company

Yes

*Woodworking

QUESTION 2

Survey respondents estimated that, in their companies, the greatest number of jobs over the next 2-3 years will be created in production, followed by support, then back office jobs, in that order.

Do you agree?
MOHAWK VALLEY ADVANCED MANUFACTURING PLAN
Appendices

*Do you anticipate other growth areas? Please list:

(Table 1) Indium Corp, NY Wired, River Hawk,
Agree. Production

*Indium Corp- Can take small engine repair, can’t find employable individuals who will show up, can’t generalize age. Specialty Production (Tool & Die)

Riverhawk Company- Change needed in social attitude (just a job) not a passion.

(Table 2) Riverhawk Company, Hartman Enterprises, Advanced Tool
Agree. Riverhawk Company is very engineering driven.

*IT Support (Marketing, Social Media, etc.)

(Table 3) CTM, Indium Corp
Agree. Production/Support/Quality-more integrated

1. Production is largest growth area
2. Support-engineers quality
3. Back Office
*All employees need to be integrated-each person does more

(Table 4) RiverHawk, Mallinckrodt Pharmaceuticals, Chobani
Agree. Production 70%, Support 20%, Office 10%

*Expected growth is 10-20% in jobs.

(Table 5) MGS Wire/Cable, AIM, F.X. Matt Brewery
Agree. Production- anyone who touches the process.

*How do you reach the people in their 30’s & 40’s- retrain, educate them on what opportunities they would have?

Weakest link- Young people being discouraged from going into manufacturing
MOHAWK VALLEY ADVANCED MANUFACTURING PLAN
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(Table 6) Indium Corp, Hartman Enterprises, Revere Copper Products
Support staff at Revere has decreased, floor staff has increased, Revere likes to hire from BOCES, still looking for individuals with advanced skills.
Needs are: A work Ethic/Professional skills
Cornell hears: No respect for the job
Growth Areas- Engineering & IT

(Table 7) Advanced Tool, Sturges Manufacturing, Gehring Tricot Corp
Agree. Production-Entry Level, Support- Skill Based-Mechanical
*Inventory/Shipping/Quality

(Table 8) Empire Fiberglass Products, Inc., Titan Homes, International Wire
Agree. Sales precede production
* Production will be most important; both support e.g. (?) will be important

(Table 9) Bartell Machinery
Agree. In this Order
*Production Technical support services to start up machines. Need PLC training; Lacking design & implementation

(Table 10) Falvo Manufacturing, Brightwater Farms LLC, Riverhawk Company
Agree. Entry-Level Production specifically

QUESTION 3
Over the next 2-3 years do you anticipate a shortage of qualified candidates? ___ (Yes or no)
Generally, what are the qualifications of candidates you currently hire- High School diploma, Certificate or some other credential, Associate Degree, Bachelor’s Degree or advanced degree?

*Do you think that will change?

(Table 1) Indium Corp, NY Wired, River Hawk,
Indium-Seeking 4 year engineering degrees, applying for Machine Operator positions to get a foot in the door.

BS & higher = more mobile population, as manufacturing has gotten smaller, young people don’t look to enter the field.

(Table 2) Riverhawk Company, Hartman Enterprises, Advanced Tool

Yes. Currently hires High School (Other characteristics work ethic etc., more important than education) for shop, other jobs may look for degree but really education level is not so important.

*No-Critical Thinking Attitude- These prevent company growth

(Table 3) CTM, Indium Corp

Yes. High School Diploma, Military-Credential depends on position, Good work ethic/Certificate program fine for production, quality could be higher

*No. Both target candidates from BOCES- have skill level they need. Need replacements for Journey Workers.

(Table 4) RiverHawk, Mallinckrodt Pharmaceuticals, Chobani

Yes. Metals manufacturing industry has more of a focus on experience and application. Math and communication skills as important in this area as the degree. Current deficiency

*No.

(Table 5) MGS Wire/Cable, AIM, F.X. Matt Brewery
Yes. Hire mid-level and train onsite or send for additional training, sometimes the experienced worker is preferred over a degree or certificate.

*No.

(Table 6) Indium Corp, Hartman Enterprises, Revere Copper Products, Cornell Cooperative Extension

Yes. Qualifications-Firm

*Gold Metal Packing- High School Diploma/ some require knowledge of food safety requirements, able to be trainable, will they stay? We will nurture entry level, Populations that have had difficulty finding employment, would hire certificated students/IEP.

Revere Copper Products- Needs at least the TASC (GED)

Cornell- Getting many refugees for the food processing industry

(Table 7) Advanced Tool, Sturges Manufacturing, Gehring Tricot Corp

Yes.

*Some other credential (same as certificate)-10%, Bachelor’s Degree-5%( Testing Lab) 30% Pharmaceutical, High School Diploma-50-80%Pharmaceutical (Assembly), Advanced Degree 10% (Pharmaceutical)

(Table 8) Empire Fiberglass Products, Inc., Titan Homes, International Wire

Yes. High School Diploma. All manufacturers predominantly looking for individuals with High School diploma people with higher skills (e.g. Bachelor’s degree) last only short time (stop gap in jobs).

*Titan Homes-$16/hr. poor quality of applicants (poor work history), 50% turnover rate (overall)

International wire-45% turnover rate (mostly new employees)

(Table 9) Bartell Machinery
Yes. Certificate, AS, BS, Don’t require advanced Degree, Have some training in Electrical through BOCES. Rather hire Machinist with skill.

*No. Lacking degreed Engineering

(Table 10) Falvo Manufacturing, Brightwater Farms LLC, Riverhawk Company

Yes. A mix, but a need for more trained labor.

QUESTION 4

Do existing programs teach the skills you want your job candidates to have? _____ (yes/no)

Or, if not, are there ways those skills can be taught that would better meet your needs?

(Table 1) Indium Corp, NY Wired, River Hawk

No. Need to find candidates that work with their hands, most young people love to work with hands but don’t pursue that trade.

(Table 2) Riverhawk Company, Hartman Enterprises, Advanced Tool

Yes. Think programs are there but confusion about where to go. Training programs are available but not always accessible due to production time loss, employment.

(Table 3) CTM, Indium Corp

No. Soft skills-Put down phone be respectful, take hat off, Interview skill- this generation struggles to interact with co-workers; Intern students are the students that aren’t seeking a career in manufacturing

*Cell Phones are a huge issue, both mentioned hiring by attitude- positive attitude critical.
(Table 4) RiverHawk, Mallinckrodt Pharmaceuticals, Chobani

No. Not enough “on the floor” Practical knowledge. Candidates have book knowledge and need to add application experience. “Teach a little, Do a little”

(Table 5) MGS Wire/Cable, AIM, F.X. Matt Brewery

No. Discussed the difficulty of hiring a recent college grad who has no real world experience. Internship programs might be an answer- would need grant funding to alleviate staff/financial burden of training an intern. Soft skills- not being taught- work ethic, dependability, job expectations, etc.

(Table 6) Indium Corp, Hartman Enterprises, Revere Copper Products, Cornell Cooperative Extension

Gold Metal-Food training & safety definitely needed, this is a big change, no general food safety training provided.

Revere- Machine training. DOL provides grants for OJT training, money is out there.

(Table 7) Advanced Tool, Sturges Manufacturing, Gehring Tricot Corp

No. Soft skills missing-Communications, work ethics, dress, no social media, business references, basic math.

(Table 8) Empire Fiberglass Products, Inc., Titan Homes, International Wire

No. International Wire- no educational programs offered in this area, there is need in machine operation training between International Wire, Owl Wire, Kris-Tech.

(Table 9) Bartell Machinery
Yes and No. Engineering is taught, but lower end skills are lacking. Drafting, schematics, Auto Cad, Solid Works. Mechanical Engineers sometimes have these, Electrical Engineers seldom have skill. Soft skills- lack of social skills, don’t interact well, don’t participate in meetings. Will send to Carnegie to learn skills, Work with MACNY for leadership training.

(Table 10) Falvo Manufacturing, Brightwater Farms LLC, Riverhawk Company

No. Soft skills for Entry level, efficient job interview skills, start students earlier with solutions besides college.
QUESTION 5

Manufacturers, please take the next 10 minutes to tell the educators at your table, what you see as the biggest weakness in the applicant pool you are seeing now.

List:

(Table 1) Indium Corp, NY Wired, River Hawk
1. Mechanical Concepts
2. Lack of ability to interact
3. Professional skills
4. Lack of preparation for interviews
5. Knowledge about company
6. Those with more life experience have a reality check
7. Less sense of entitlement
8. Need basic concept of competitions

(Table 2) Riverhawk Company, Hartman Enterprises, Advanced Tool
Leadership, Mechanical skills, blueprint reading (customized); Inspection hand held equipment (micrometers for example); machining basic concepts; quality management systems & paperwork associated with it. Management (see question 3) Loyalty, commitment.

(Table 3) CTM, Indium Corp
Lack of qualified candidates to backfill vacancies, math –critical, trade skills- HVAC, electrical, auto, and plumbing- fine motor skills.
EDM: Electronic tool cutting -leadership -Forman/Supervisor
Manufacturers concerned about employees retiring and a lack of qualified entry employees to backfill.

(Table 4) RiverHawk, Mallinckrodt Pharmaceuticals, Chobani
Practical knowledge, weak math skills, better understanding of Apprenticeship programs, communication skills, “not just a warm body” “need a warm body that can think”
(Table 5) MGS Wire/Cable, AIM, F.X. Matt Brewery

**Electrical controls** - Programming higher level troubleshooting, Machinery automation controls, Mechanical engineering (CAD), Machinery design, Equipment design, welding, Mechanics. **Soft skills** - Communication skills, work ethic, interaction with co-workers, working under pressure. Application theory - Soft skills, cross functional education. Concrete skills are lacking.

(Table 6) Indium Corp, Hartman Enterprises, Revere Copper Products, Cornell Cooperative Extension

**Weaknesses** - Professional skills, math/computation skills, calibrate skills, fine motor coordination, electricians cannot be found, skilled trades (tool & die, machinists/welding), plumbing, butchering skills ($18-22 per hr.), reasoning skills

(Table 7) Advanced Tool, Sturges Manufacturing, Gehring Tricot Corp

**Metrics vs. standard conversions (tape measure) reading comprehensive**, communications, ethics, language, harassment, behavior.

(Table 8) Empire Fiberglass Products, Inc., Titan Homes, International Wire

Math skills (at high school level), Work Ethic (steady work history), critical thinking and common sense, soft skills such as customer service & working with others.

(Table 9) Bartell Machinery

**Lack of soft skills** as described in Question 4, getting people to our area, desire to come to region.

(Table 10) Falvo Manufacturing, Brightwater Farms LLC, Riverhawk Company

**Soft skills, desire to work, work ethic**, general work experience, **product evaluation, basic manufacturing skills**

**Question 6**
Manufacturers, do you provide in-house training now? ______ (yes/no)

(Table 1) Indium Corp, NY Wired, River Hawk
Yes. Indium Corp-New hire orientation (confidentiality, quality safety marketing) Job shadowing for 2-8 months.
RiverHawk-still searching for the best ways to pull workers along after initial orientation, need tactical experience with materials & then ability to adjust to environment.

(Table 2) Riverhawk Company, Hartman Enterprises, Advanced Tool
Yes. Orientation, gauge training-on demand or “On the Fly”.

(Table 3) CTM, Indium Corp
Yes. CTM (AS90 100-Quality Standards), Indium (TS16949) HCCC- GD’/Art Rapp (OCWD) discussed OJT/ Indium does some partnering with refugee center, CTM- pays employees to attend classes (grant thru HCCC) for GD’T, Indium does Dale Carnegie/APICS-Six Sigma. CTM has some issues with Refugees (high security due to some of the military contracts)

(Table 4) RiverHawk, Mallinckrodt Pharmaceuticals, Chobani
Yes. Metals-Design side (extensive) Production (informal training 6months) Pharma (Extensive training, 10/20/70 model) spending a lot of money on in-house increase of skill sets.

(Table 5) MGS Wire/Cable, AIM, F.X. Matt Brewery
Not formal-tailored to each individual and what they need, might send the employee out for additional training. F.X. Matts-Send people out for training, invest a lot of time and money but not structured or methodical. Short OJT training-Production, Admin- No training, expected to hit the ground running.

(Table 6) Indium Corp, Hartman Enterprises, Revere Copper Products, Cornell Cooperative Extension
Revere Copper Products- Leadership & interpersonal skills training:
OSHA
Respirator-recipients get certificate
Refresher math training
Technical Training
Crane
LEAN Training

Indium Corp- Many of the same trainings as Revere, Tuition support

(Table 7) Advanced Tool, Sturges Manufacturing, Gehring Tricot Corp

Yes.
Pharm Industries- Training Manager/ trainers signed off on each 90 days (Observe, Assist, and Provide)
Production Trainer/mentor/testing, hands on
Floating-mentoring

(Table 8) Empire Fiberglass Products, Inc., Titan Homes, International Wire

Yes.
Titan- Safety Training; cross training (new skills sets) not a formalized program though.
International Wire-Leadership training; OJT
Empire Fiberglass- Safety/Hazmat; OJT; industry-standards 6 week program; specific training based on particular products

(Table 9) Bartell Machinery

Yes. Workplace violence & safety, Orientation Training, Safety training (MSOS, OSHA, Hazardous, Lockout, Tag out).
Vendor Training-In house (State/Fed Funded)
PLC, Auto CAD, Solid Works- 1 week classes/ FEA training
Grand funding for - **Six Sigma, Green Belt, LEAN manufacturing**, MACNY training

**Table 10** Falvo Manufacturing, Brightwater Farms LLC, Riverhawk Company

Yes. Intense for good **safety**, 4 hour Employee safety /equipment training, rely on trade associations for additional, main cost is time.
QUESTION 7 & 8

Do you currently offer internship programs as a way to vet new employees? Why or Why not?

*Do you currently offer apprenticeship programs as a way to train employees? Why or Why not?

(Table 1) Indium Corp, NY Wired, River Hawk

Yes.

Indium- Paid internships over summer, 12 weeks-10 interns, R & D, Technical support, etc., not currently running apprenticeship, only informal/ workers who are training in-house

Riverhawk- 1-4 interns each summer (Mechanical, Electrical)

Yes. Apprenticeship in machine ship mismatched between needs and partnership with Ed community (Takes time, a lot of work) Too few see as a job, not a career

(Table 2) Riverhawk Company, Hartman Enterprises, Advanced Tool

Don’t have personnel available to put time into

Supervise- would be interested.

Express Employment says out of 50 Companies they service only 5 offer internship experiences

*No

(Table 3) CTM, Indium Corp

Yes.

Indium_ does 10-12 internships per year-usually they have 400 + applicants-hire many after internship

CTM has 2 internship programs- One summer for college students- College Core, also has interns from MVCC.
*No. Fear of inviting DOL into facilities-education needs to happen regarding apprenticeship programs. Employers may feel there is expense to apprenticeship

(Table 4) RiverHawk, Mallinckrodt Pharmaceuticals, Chobani

Yes/No

Mallinckrodt Pharma- Very active Internship program with RIT and Clarkson. Looking to learn more and engage with a local Apprenticeship program.

Meyda- No formal approach either.

(Table 5) MGS Wire/Cable, AIM, F.X. Matt Brewery

No. Internships are difficult because of the burden manpower and financial resources.

*Yes. Machine shops, welding, and electrician-nothing formal

No formal program from either manufacturer at our table

F.X. Matt- Not at this time, longevity of their workforce is 22 years

Granny’s Kitchen, Deiorio’s, Remington Arms- would benefit from apprenticeships.

(Table 6) Indium Corp, Hartman Enterprises, Revere Copper Products, Cornell Cooperative Extension

Yes. Indium- Starting to evaluate Apprenticeships

No. Revere Copper- Full apprenticeship- Tool Maker (Students need to see it), Electrician, Mechanic.

(Table 7) Advanced Tool, Sturges Manufacturing, Gehring Tricot Corp

Yes. Interns-become full time/ Quality Lab, Apprentice- Technical/ Management, Temp Agency- 8-12 week (Mechanics)

(Table 8) Empire Fiberglass Products, Inc., Titan Homes, International Wire
Yes. Empire Fiberglass- regularly takes on CAD interns who often stay on board, *Apprenticeships are extended internships.

No. International Wire- offers internships that primarily go to family members of employees, *No apprenticeship program as it portrays union shop.

(Table 9) Bartell Machinery
Yes. Took 12 Interns and transitioned 8 of 12 into Apprenticeship,
*Yes. 35% of Interns/mentorships typically become Apprenticeships

(Table 10) Falvo Manufacturing, Brightwater Farms LLC, Riverhawk Company
Yes. Offered for ag Production, few takers, not in past for woodworking, but interested in going forward.
*No. unable to find right people

QUESTION 9

Do you think the region needs new degree/certificate programs to meet your current and future needs?

*What are your suggestions?

(Table 1) Indium Corp, NY Wired, River Hawk
Yes. Programs exist but don’t draw/advertise employers may not be aware of those that exist or what’s covered.
*Mechatronics-Lab

(Table 2) Riverhawk Company, Hartman Enterprises, Advanced Tool
Yes. Need more narrow/specialized skill and deeper training for example: Inspection tools.
*More certificates
(Table 3) CTM, Indium Corp

Yes. General program for shop work- math, soft skills, safety, OSHA, DOH-possible 6 week program.

*Basics of shop floor manufacturing, blueprint reading

(Table 4) RiverHawk, Mallinckrodt Pharmaceuticals, Chobani

Yes. Mechanical, Electrical 2 year degrees to begin production work in the Pharma Industry.

*College graduates having a basic understanding of LEAN manufacturing

(Table 5) MGS Wire/Cable, AIM, F.X. Matt Brewery

Systems are probably already out there, the problem is there are no candidates.

Manufacturers need qualified candidates with the skill sets- can’t afford to train them after hiring.

*Mechanical/Electrical Engineering technologies, Trades

(Table 6) Indium Corp, Hartman Enterprises, Revere Copper Products, Cornell Cooperative Extension

We need to tell manufacturers about the certificate programs to CTE (CareerTech)

(Table 7) Advanced Tool, Sturges Manufacturing, Gehring Tricot Corp

Yes. Career Ready Certificate.

(Table 8) Empire Fiberglass Products, Inc., Titan Homes, International Wire

Yes. Titan Homes- None, but need local students to be aware of relevant programs and job opportunities.
No. International Wire- Consultants with several BOCES & MVCC about programs, but no particular changes to new curriculum.

(Table 9) Bartell Machinery
Yes. Parents are driving kids to college, need to push towards the Trades.

(Table 10) Falvo Manufacturing, Brightwater Farms LLC, Riverhawk Company
Yes, Controlled-environment agriculture.

QUESTION 10

Many residents who have a college degree seek work in a field unrelated to their majors. In this region, do you see a need for more short-term training that could give applicants, lacking technical skills, the basics they need to be productive? _____ (yes/no)

Please describe that training:

(Table 1) Indium Corp, NY Wired, River Hawk
Depends on expectations.

NY Wired-introduces NOAD, introductory workforce courses that can be taken on line (15 Hours) Basics in manufacturing (Amatrol manufacturing skills)
(Table 2) Riverhawk Company, Hartman Enterprises, Advanced Tool
Yes. Inspection instruments, trainers need to get into local companies to see what the product/processes/work is then train the workforce.

(Table 3) CTM, Indium Corp
Yes. Depends on job, don’t need people who are too free thinking or over educated- need to follow a pathway employer lays out (some over think and question why too much), also depends on size of company larger companies can hire more diversely qualified people.

(Table 4) RiverHawk, Mallinckrodt Pharmaceuticals, Chobani
Yes. Co-op Programs, basic short term training in LEAN Manufacturing concepts, previous practical experience training.

(Table 5) MGS Wire/Cable, AIM, F.X. Matt Brewery
Yes. “Boot Camp” -Short term training-essential skills specific to the jobs.

(Table 6) Indium Corp, Hartman Enterprises, Revere Copper Products, Cornell Cooperative Extension
Students are lacking basic conversational skills, Indium brought in Dale Carnegie for summer interns.

(Table 7) Advanced Tool, Sturges Manufacturing, Gehring Tricot Corp
Yes. Technical- Applying the Math

(Table 8) Empire Fiberglass Products, Inc., Titan Homes, International Wire
No obvious short term training program needs, but there is a need for critical thinking capability and problem solving skills.
(Table 9) Bartell Machinery

Yes. Selling a lot of machines to newly built companies. Production is coming back, companies having trouble finding staff.

(Table 10) Falvo Manufacturing, Brightwater Farms LLC, Riverhawk Company

No. On the Job training is most important.

QUESTION 11

Is there a preference for either pre-hire training programs to increase the skills of the overall pool of applicants or on the job (OJT) training to train those already hired?
Yes/no, to pre-hire training?
Yes/no, to OJT training?
Yes/no, to both?

(Table 1) Indium Corp, NY Wired, River Hawk

Because of proprietary nature of work training on the job will always be necessary.
Indium Corp- Turnover =either manufacturing is not for me or can’t meet work standards, reliability. We set up small ramp up scenarios to prepare workers to move to new platforms

(Table 2) Riverhawk Company, Hartman Enterprises, Advanced Tool

Yes. Must have

(Table 3) CTM, Indium Corp

Yes to both. OJT for incumbent workers, Pre-Hire training- 2-4 weeks (not extensive)

(Table 4) RiverHawk, Mallinckrodt Pharmaceuticals, Chobani

55
Yes to both. Combination of OJT and Pre-hire

(Table 5) MGS Wire/Cable, AIM, F.X. Matt Brewery
Yes to both. Depends both can be desired, a combination of both
Engineering-Pre-hire
On the floor- OJT

(Table 6) Indium Corp, Hartman Enterprises, Revere Copper Products, Cornell Cooperative Extension
Yes. To OJT training

(Table 7) Advanced Tool, Sturges Manufacturing, Gehring Tricot Corp
Yes. Pre-hire training and OJT training
Basic skills or advanced if required, depends upon the job, equipment training-by the manufacturer.

(Table 8) Empire Fiberglass Products, Inc., Titan Homes, International Wire
Yes to Pre-Hire training- Titan Homes
Yes to OJT training-International Wire, Empire Fiberglass Products

(Table 9) Bartell Machinery
Yes to Pre-hire training (But no way to get this)
Yes to OJT Training-Need
Yes to both- ideally will come together

(Table 10) Falvo Manufacturing, Brightwater Farms LLC, Riverhawk Company
Yes. OJT training
Executive Summary

As part of a grant-funded Workforce Development Board effort to better understand manufacturing workforce development needs across a nine-county area in New York’s Mohawk Valley, food and beverage processors were invited to participate in “roundtable discussion” sessions held in Cobleskill, NY and Rome, NY in the spring of 2017. Follow-up discussions were held with several processors via phone. Participating processors ranged from a large co-packing entity with a coast-to-coast clientele radius to small sole proprietor food companies with NY 20-C Commercial Kitchen licensures. Key themes that emerged from these discussions include:

- Because of higher demand from direct-to-consumer, wholesale or contract packing clients/venues, food and beverage processors in the region are expanding and as a result will require additional employees over a five-year planning horizon
  - Expansion plans typically include both growth in operation scale and product/service diversity
  - Food and beverage manufacturers forecast equally significant growth in “downstream” employment opportunities including those with specialty retailers, restaurants, wholesalers and agro-tourism operations
  - Larger operations rely heavily on “temp agencies” for new employees
- Perceptions among educated working-age populations about the menial and potentially manual nature of food/beverage processing jobs often results in less-than-adequate applicant pools
- Business owners and managers lack leadership/management know-how to motivate workers to optimal performance and to adequately address human resource-related problems/conflicts in the workplace
  - Small business owners face time and resource constraints for adequate management/leadership training and may be too “possessive” with their businesses to give employees the flexibility or independence to grow professionally and contribute meaningfully to improving operations
- Business owners and managers cite “soft skills” and professionalism as the primary deficits in job applicants or current employees and the most pressing need for workforce development; specific “soft skills” programming needs include:
  - Professional communication/interaction in the workplace
  - Work ethic and responsibility
  - Customer service
- While food and beverage manufacturers provide on-the-job technical skills training and are willing to hire candidates without pre-existing technical know-how, most expressed keen interest in hiring workers with technical credentials in:
Appendices

- Food safety and sanitation (HACCP or GMP certification, for example)
- Process engineering
- Workplace safety
- Back-office management/organization
- Inventory management
- Management software/Record Keeping applications (such as Excel or QuickBooks)
- E-marketing and website development
  - Food and beverage manufacturers largely expressed willingness and capacity to provide additional compensation to current or would-be employees with relevant technical training
- Small and medium-scale food and beverage manufacturers cite inability to pay for external employee training opportunities and consider the risk of newly-trained employees leaving the business as significant
- Expansion of already large processing/co-packing systems naturally means enhanced automation, a lower worker-to-fixed-capital ratio and often more significant regulatory hurdles; in addition, automation demands more advanced worker skills
  - Existing employees, especially those 45 and older, often struggle to adapt to changes in technological or regulatory parameters in the workplace

Participating Food & Beverage Manufacturers and Related Entities

- Brooks Bottling Co., LLC—Oneonta, NY
- F.X. Matt Brewing Co./Saranac Brewery—Utica, NY
- Beech-Nut—Amsterdam, NY
- Green Wolf Brewing Co.—Middleburgh, NY
- Wellingtons Herbs & Spices—Schoharie, NY
- Toonie Moonie Organics—Fly Creek, NY
- Weathertop Farm—Sharon Springs, NY
- MOS Delicious—Sharon Springs, NY
- Sap Bush Hollow Farm—West Fulton, NY
- Serious Brewing Co.—Howes Cave, NY
- Cobleskill Auxiliary Service, SUNY Cobleskill—Cobleskill, NY
- The Center for Agricultural Development & Entrepreneurship—Oneonta, NY
- Copper City Brewing Co.—Rome, NY
- Various members of the Northeast Dairy Producers Association

Food & Beverage Sector Challenges/Threats

Despite unanimously cited prospects for business expansion among participating food and beverage manufacturers, the sector faces significant challenges that will undoubtedly amplify with growth. Among larger, well-established contract manufacturers, these include:
MOHAWK VALLEY ADVANCED MANUFACTURING PLAN
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- The necessity of increased automation and resulting complexities of worker re-training and worker adaptation
- Lack of profitability associated with but high demand from low-volume co-pack clients
  - Many individuals seeking co-packing arrangements are not large enough to meet current minimum volume requirements and have historically been turned away
  - To meet this significant potential demand, co-packers must invest in more flexible equipment and adjust operational strategies
- Lack of formal Human Resources departments/functional areas to explicitly address workforce issues
- Less-than-competitive compensation for skilled workers (electricians, plumbers, maintenance)
- Lack of leadership training/preparation opportunities for upper- and middle-managers, which translates to:
  - A “divided culture” between management and labor
  - Less-than-optimal “buy in” from labor
  - Undue time spent dealing with worker-related issues on a piecemeal basis
- Reliance on “temp agencies” for unskilled labor
- Deficiencies, primarily in soft skills, among workers at all levels

Among smaller processors, perceived challenges and threats include:

- Translating small-batch recipes to large volume production
  - The “scaling-up” process and relationships with co-packers often result in changes in palatability
- Customer perceptions of the loss of “artisanal” and “local” characteristics of products once producers contract with out-of-area co-packers with growth in demand
- Lack of flexible equipment and space at large co-packing establishments
  - Large co-packers are often not set up to produce products that contain high proportions of solids or require ingredients that do not easily store
- Difficulty in finding part-time and full-time employees and seeming lack of interest among local residents
- Deficiencies, primarily in soft skills, among workers at all levels

Reported Workforce Deficits and Training Needs

Without exception, the food and beverage manufacturers participating in this study cited scale and scope expansion plans over a five-year horizon. Unfortunately, both large and small manufacturers currently struggle to identify prospects for part-time and fulltime positions and this problem will
undoubtedly become more significant as more employees and more full shifts (Matt Brewing, Brooks Bottling) are required with growth.¹

All large processors claimed exclusive or partial use of temporary agencies for filling unskilled laborer positions. Small companies rely on local and word-of-mouth marketing for hiring these types of positions, often to no avail. Aggregated, producers report that less than 50% of employees hired for unskilled positions stay on the job for more than 6 months. Two large producers suggested that certain types of skilled positions are often difficult to fill because starting wages do not match those offered to plumbers, electricians, technicians and others in construction and other industries. This is not the case with “product specialist” positions—the actual brewers, food scientists and/or product development personnel that work for food and beverage manufacturers. Because of their importance to brand consistency and product safety for all of these firms, these professionals are well compensated and rarely leave their jobs to take other positions. Most respondents expressed keen interest in hiring from among at-risk populations including veterans, displaced women and ethnic minorities but none are consistently able to find and target these people.

As reported by processors large and small, the “cultural” problem underlying the perceived lack of interest in employment with food and beverage manufacturing firms is the assumption that these are “factory” jobs with low pay, physical demands and no opportunities for advancement. In reality, the opportunities for advancement, especially with larger firms, seem ample. In addition, workers at one of the largest producers in the group (Matt Brewing) are unionized, which affords them higher starting wages and more worker protections than what might be available at similar skill levels elsewhere².

At a management level, both large and small firms ubiquitously struggle with a lack of resources. Specifically, none of these firms have dedicated Human Resources offices or professionals. Instead, considerable owner/manager time is devoted to resolving conflicts among workers or otherwise dealing with employee-related issues. Companies have also not invested in leadership, sensitivity or other training for managers, who have most often been promoted over time to their current position. As a result, managers have insufficient skills for (1) encouraging/motivating workers with the prospects of advancement/promotion; (2) developing incentive programs to reward productivity; (3) facilitating a sense of “ownership” and “team” among low-skill workers; (4) resolving cultural conflicts that arise between long-established (older) and new (younger) workers; (5) relaying the company’s “story” and culture to employees to generate buy-in and work ethic; (6) discouraging “clique-building” and self-imposed segregation among the workforce; (7) effectively instilling workplace safety principles; (8) easing the transition of older employees into new automation or regulatory realities; and (9) implementing and operating “lean” manufacturing systems with full employee understanding and buy-in.

Without exception, food and beverage manufacturers cited deficiencies in soft, not technical, skills as their most pressing challenge with existing and would-be employees. Maintenance, plumbing,

¹ Two participants indicated that they have participated in job fairs in the past with hundreds of prospects but NO hires.
² Workers emanating from temporary agencies at Matt Brewing progress to $18 - $20 per hour within two years of hire and have potential to accelerate into “skilled” jobs
electrician, IT and other technician positions AND “product specialists” are hired with existing technical skills and typically have to spend only a small amount of time learning how to translate those skills to a particular firm’s systems. Technical know-how required of more unskilled positions is taught on the job at relatively low cost to the employer, as these tasks are largely repetitive and can be learned quickly (line work, for example). Though none provided examples or evidence of past effort, companies suggested that most external technical skill training programs would prove too costly for them to subsidize their employees’ training. Further, large manufacturers shared concerns that incoming or current workers with enhanced technical credentials may choose to search for other positions, thereby negating the company’s investment in training.

Despite perceived challenges with affordability and investment return, ALL manufacturers keen interest in hiring and willingness to adjust compensation for employee prospects with the following technical credentials:

- **Food safety and sanitation**
  - Particular interest in Hazard Analysis and Critical Control Points (HACCP) training, Good Manufacturing Practices (GMP) training, Training for Intervention Processes (TIPS) education (for brewers only—this is designed specifically for safe service and sale of alcohol), and ServSafe certification (for food handlers and food managers)

- **Process engineering**
  - This was suggested as potentially important only by one large firm; process engineering would include training in generic processing facility equipment, processes and layout and exposure to “lean” operating systems that seek to minimize work-in-process and component inventories

- **Workplace safety**
  - This was noted by nearly all participants and includes specifically basic first aid, safety around chemicals and hot materials and precautions around heavy fixed and other machinery
  - Two large employers noted that workers often perceive that jobs and the work setting are more hazardous than they are in reality and that programmed safety training might alleviate these concerns.

- **Back-office management/organization**
  - This is relevant to small-scale food and beverage manufacturers whose employees are more often “Jacks of all trades”; just as useful for managers/owners as employees

- **Inventory management**

- **Management software/ Record Keeping applications (such as Excel or QuickBooks)**
  - This is also most relevant to small-scale manufacturers and would prove just as useful for managers/owners as employees

- **E-marketing and website development**
  - This is also most relevant to small-scale manufacturers and would prove just as useful for managers/owners as employees.
This skill-set is of considerable interest among small-scale producers since their in-house marketing prowess is seemingly severely limited; many owners cited lack of time and energy available for extensive marketing work.

Soft skill deficiencies, however, are of most significant concern to these manufacturers. They contribute to worker turnover, reduced productivity, workplace morale and inefficient use of management time. Problems most commonly described by manufacturers among incoming and current employees include:

- Work ethic and energy
- Immediate focus on advancement as opposed to good performance
- Tendency for young people to “mingle” and want to work in groups; difficulty working for long periods of time without interpersonal communication
- Lack of communication between different age or ethnicity groups
- Workers only interested in parts of their job, with deficient performance in other parts
- No personal “ownership” of the company’s product, brand or image
- Lack of customer relations skills and negative attitude
- Lack of organizational skills
- Lack of self-esteem and confidence
- Tendency to bring personal lives into the work environment

Proposed Solutions: Vacancy Filling and Employee Search Processes

Given the unanimously cited challenges of identifying adequate pools of prospective employees for unskilled and some skilled positions, effort must be made in the region to (1) elevate food and beverage manufacturing as a viable career choice for young people; and (2) lower the search cost for prospective employees.

To the first point, focus group participants suggested opening up manufacturing facilities in the region to school and collegiate group tours and developing programming for integration in middle- and high-school curricula that builds linkages between food and beverage products and the processes required to make them. In NY, innovative “P-Tech” high school programs use project-based learning to accelerate students to both a high school diploma and an Associate’s degree, usually in an agricultural or STEM-related field. A mechanism for sharing food and beverage manufacturing-related problems/projects among manufacturers and P-Tech teachers could be developed in the region and would constitute direct exposure of students to the types of opportunities and challenges faced in food and beverage-oriented systems.

To the challenge of lowering employee search costs, regional colleges and high schools could build more robust job position announcement processes/tools within their institutions and on their websites. Though the capacity for private employers to post position openings on collegiate websites largely exists, the same cannot be said of all secondary school districts in the region. A more interactive approach whereby instructors and school administrators are able to provide applicant/candidate ratings via a streamlined system would also be beneficial to employers.
For accessing other and potentially at-risk populations, more robust lines of communication between employers and Community Action Program, Workforce Development and other agencies are required. Pairing these efforts with in-house mentoring programs (between seasoned and new employees) might ensure that workers transition seamlessly out of potentially challenging life situations.

**Proposed Solutions: Enhancing Managerial Acumen**

Given that lack of formal managerial training impacts food and beverage manufacturers’ operations in myriad and costly ways, these firms are willing to invest resources to ensure that managers are equipped and flexible enough to deal with operations and human resources challenges. To that end, SUNY Cobleskill and other regional colleges can collaborate to develop a “Management Academy”, comprised of both traditional in-person and online programming. Due to managers’ time constraints, programming must be accelerated and capable of generating significant learning outcomes in very little time.

Because such programming would be non-credit bearing, fee structures can be flexible and would be designed to cover only instructor and minimal overhead costs. Instructor pools would be drawn from current Business Administration faculty at participating colleges, retired managers and SCORE, a volunteer association of retired business professionals and others who provide no-cost mentoring to businesses and entrepreneurs.

College students enrolled in Business Administration, Agricultural Business Management or other programs could contribute to program implementation as program interns (or otherwise receive academic credit). Their roles may include curriculum development, role-playing for in-person training, management of online registration and program components and the like. This is a low-cost approach that also generates valuable experiential learning outcomes for the students.

Completion of training through the proposed “Management Academy” might facilitate traditional credit, grant and other funding streams for these businesses as they seek to expand. Program assessment would include measures of increased workplace safety, worker satisfaction, employee retention and other metrics that directly suggest management competency.

**Proposed Solutions: Technical and Soft Skill Training for Employees**

SUNY Cobleskill and other regional colleges currently offer non-credit bearing programming relevant to the technical needs/deficiencies enumerated above. This currently includes HACCP training, ServSafe certification and website development. Mohawk Valley Community College has offered to develop more tailored curricula for their existing electrical/mechanical technician programming that might speak to the needs of food and beverage manufacturers. Unfortunately, these programs are materials- and facilities-intensive and are therefore not inexpensive. Manufacturers may ultimately remain unable to subsidize these experiences for their employees and new hires.

However, soft skill training may prove less resource intensive and as described above, it is seen as considerably more important to food and beverage manufacturers. Agencies and educational institutions in the region should first inventory existing soft skill/professionalism-training programs available in the U.S. and vet whether any of them are adaptable to this region and economic sector.
Colleges rarely offer formal programming in soft skills and professionalism but it would prove worthwhile to assess what might be available there for aggregating into an online or traditional accelerated program that would be available to employers for new hires and existing workers (fee-based).