



## **REGIONAL TALENT PIPELINE STUDY**

### **REPORT TO THE GREATER CAPITAL REGION WORKFORCE INVESTMENT BOARDS**



## **Executive Summary**

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June 30, 2009

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**REPORT TO THE GREATER CAPITAL REGION**  
**WORKFORCE INVESTMENT BOARDS**

Prepared for

**The Four Greater Capital Region Workforce Investment Areas**

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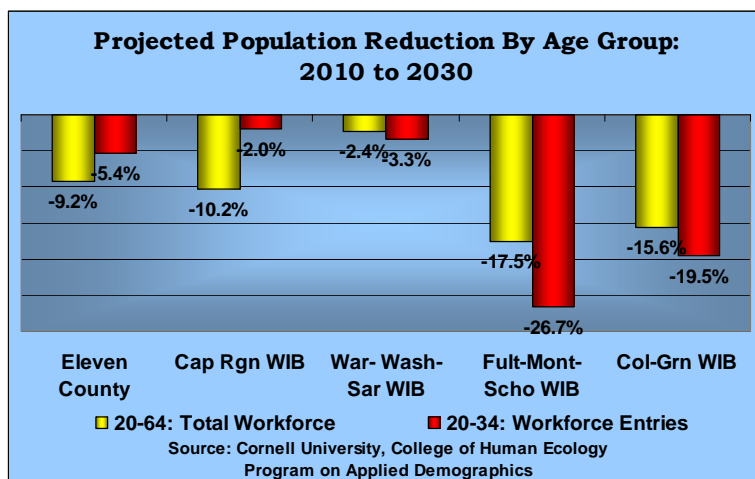
This Talent Pipeline Report was made possible through a regional grant from the New York State Department of Labor to the Fulton, Montgomery, and Schoharie Workforce Development Board on behalf of the Greater Capital Region WIBs. The New York State Department of Labor retains all rights to this Report.

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## Executive Summary

The jobs are coming.  
But we won't have the people with the skills to fill them.  
That's the disconnect!

The world economy is undergoing a significant transformation and the Capital Region is not immune. Our economic mix is changing in ways similar to the rest of the nation – moving away from heavy industry to more of a service and “knowledge” economy. But we in northeastern New York face special challenges -- trends and features that are not found in many other regions. The coming of the GlobalFoundries chip fabrication plant in Malta is the most visible part of this change, but there are also a growing number of small high-tech manufacturers, emerging biotech, nanotech, and green energy companies, and the development of an advanced construction industry related to clean room construction and renewable energy.



The demand for skilled workers is increasing, but there is data to show that the supply is not. Population projections indicate that the number of workers in the region, with or without the necessary skills, will decline over the next twenty years. The challenge will be not to find jobs for people but instead, **to find people for the jobs.**

The Greater Capital Region Workforce Investment Boards

(WIBs) recognized the need to identify the skill sets that are required to staff these industries (with a special focus on mid-level technician positions), and how the region can best respond to the coming shortage. As part of this response, the WIBs have contracted with Krieger Solutions, LLC to conduct a “Regional Talent Pipeline Study.”

### Methodology:

The study process was largely qualitative – through a series of formal focus groups and individual in-depth interviews, the consultants conducted more than 400 hours of discussions, mostly in-person, and the remainder via telephone. Approximately half of the respondents were business leaders, with the rest made up of workforce development professionals, educators, government officials, and community leaders. In addition, greater than fifty reports on subjects including employment projections, workforce pipeline methodologies, and economic development efforts were reviewed. While some of the opinions cited in the report may be challenged as to their accuracy and interpretations, nonetheless, these views and statements are real beliefs and judgments held by multiple analysts and professionals, rendering them valid as data. The findings and action items presented here are supported by this research.

## ❖ The Scope:

The Regional Pipeline Study is part of a comprehensive project related to the Greater Capital Region’s workforce needs. In this phase, Krieger Solutions, LLC was asked to determine:

- The skill sets needed by workers in mid-level technical positions in the emerging high-tech industry (mid-level was loosely defined as requiring a two-year college degree or less).
- How the region can best support the strengthening of its workforce through the development of a “talent pipeline” to meet these emerging needs.

Five sectors were selected for study; all are deemed to be significant and growing in the region, and all present considerable opportunities for mid-level technical employment:

- **Advanced Construction** – defined as building facilities with clean rooms, installing “green energy” systems, and constructing green buildings.
- **Advanced Manufacturing** – defined, at a minimum, as those using CNC (Computer Numerical Control) operated systems.
- **Biotech / Biomedical Companies** – expanded to include health care technicians.
- **Energy Companies** – especially renewable.
- **Nanotechnology Companies** – including those affiliated with universities.

## ❖ Findings:

### 1. Shortage of workers for emerging jobs.

The evidence indicates that there will be a large demand for highly skilled technicians that the current workforce cannot fill. The gap will be expressed in sheer population figures, as well as finding workers with the necessary skills. And over time, the gap will widen.

Demographic data shows that the regional workforce will not be large enough to fill all the jobs that are forecast, which leads to three possible outcomes:

1. A net inflow of labor.
2. A reduction in the forecasted need, as businesses go elsewhere.
3. A major effort to develop the necessary skills among the local population is undertaken.



**GE Wind Energy Learning Center employee, 250 feet in the air servicing a GE 1.5 MW Wind Turbine.**

Photo courtesy of GE Wind Learning Center, Schenectady, NY.

## 2. Desired Skill Sets for Mid-Level Technicians.

A major focus of our study was to identify the skills employers want for mid-level technicians, and then, to determine which of these skills were difficult to find in the current labor force.

Desired Skills and Abilities for Mid-Level Technicians (Employer-Identified)		
Soft Skills	Critical Thinking / Interpersonal Skills	Hard Skills
Attendance	Trainable – Willing and Able to Learn	Computer Skills
Basic Communication Skills	Detail-Oriented / Process Oriented	Math and Measurement
Appropriate Dress	Teamwork / Advanced Communication	Reading
Dignity and Respect	Problem Solving and Critical Thinking	Writing
Proper Use of Company Time	Dealing with Conflict and Stress	Science
	Ownership	Technical Background Mechanical Aptitude
	Perseverance and Motivation	Documentation
	Maturity and Integrity	Health and Safety
	Flexible – Able to Handle Change	
	Initiative	

In addition, prior work experience is regarded as beneficial.

## 3. Insufficient capacity in the training system to meet anticipated demands.

Employers suggest that those possessing technical skills are fully employed in the region, with little slack. Each year, local colleges and training entities prepare and graduate many individuals with technical skills, and they are typically hired immediately. With the projected addition of 1,200 technicians needed by GlobalFoundries and GE in two years, the shortage will become severe.

## 4. Employers see little value in the current workforce development system.

Most businesses see the focus as primarily on job seekers and not the needs of employers. Many feel that WIB meetings provide no value. “They don’t speak our language.” And yet, businesses want a stronger two-way relationship, if they can be convinced that useful actions and outcomes would result.

## 5. Four-year college preparation is the education system’s primary mission.

Due to the pressure from parents, teachers, and society in general, students miss out on the exposure and education that two-year college degrees can offer. They may also miss out on the emerging opportunities in the region.

## 6. High schools do not do enough to prepare students for the world of work or college.

Too many high school graduates need remedial work in math and language skills at college or on the job. Employers expressed frustration with the number of job-seekers lacking these skills.

Employers are also consistently surprised about the lack of “soft skills” – the ability to communicate, work well with others, have commitment to the job and to the employer, and take initiative. By focusing on rigid structures of lecture, testing, and individual grading, high schools fail to teach these other key competencies. As one respondent stated, “They have a name for teamwork in school – it’s called “cheating.” These skills are teachable, but are rarely part of the curriculum beyond the middle grades.

**7. High schools do not connect with business, nor offer helpful career guidance.**

Employers have limited ties to local high schools, and believe that guidance counselors are overworked and have other priorities. BOCES is an exception, with excellent models of how schools and businesses connect, but the stigma technical programs face (“that’s where the bad students go”) is difficult to overcome.

**8. The relationship between businesses and community colleges is of uncertain value to employers.**

Employers have mixed views on how to best use community college resources in their businesses, due to the cost, varying levels of responsiveness, and ease of access. Some colleges lean toward preparing transfers to four-year colleges, while others concentrate on “terminal” two-year degree programs. While recent changes have sped up the State’s program approval process, making it easier for colleges to respond to employer requests in a quicker manner, the credit and non-credit sides often do not communicate or coordinate their efforts. There is also little communication between colleges, according to college administrators.



**Something you might see on Sci-Fi:  
Optical Tweezers, from RPI Biotech  
lab.**

Photo Courtesy of Rensselaer Polytechnic Institute,  
Center for Biotechnology and Interdisciplinary  
Studies, Troy, NY.

**9. Successful pipelines already exist in the region.**

We found many examples of local initiatives, operated by a variety of entities, which are succeeding in preparing and bringing qualified workers to high-tech businesses. They can benefit from greater collaboration, technical assistance, and sharing of ideas. There are gaps in the network, and the addition of other local initiatives is needed to fill them.

**10. Many segments are not sufficiently engaged in technical careers.**

At a time when there is a shortage of skilled workers, there are numerous populations that are underrepresented among mid-level technicians, including women and minorities. Many of our employer-respondents expressed interest in expanding this labor pool via early career education, training, and recruitment. Several also volunteered to change job descriptions to better accommodate workers with disabilities.

## ❖ Action Items

Based on our research, we have developed a set of recommendations designed to:

- Strengthen the regional workforce system.
- Better prepare community residents for the modern work world.
- Provide a skilled and productive workforce to employers in the emerging high-tech industries.

### 1. Move to implementation -- stop further general studies.

A number of studies on the Capital Region workforce development system have come to similar findings and conclusions, as have studies we examined from other regions. The action items that follow, like the findings, were for the most part derived from a broad consensus of area respondents.

### 2. Develop a regional talent pipeline system that enhances and does not duplicate local efforts.

Our recommendation is to support local pipeline efforts by providing assistance and coordination to enhance working relationships between business, educators, and workforce developers.

- ◆ Develop a directory of existing talent pipelines via a web portal, benchmark successful practices, share this information, and use it to guide resource allocations and expand the network of local pipelines.
- ◆ Structure all pipeline and workforce development efforts by economic market needs, industry sectors, or training resources, not by political subdivisions. Create task forces with defined, action-oriented agendas that focus on specific growth sectors, such as technology, health care, manufacturing, and energy.
- ◆ Continue to identify workforce development needs of local employers and feed this information to educators across the region. Provide educators increased access to employers and current career information in the emerging sectors.
- ◆ Develop training/awareness programs to help educators and workforce development professionals interact more productively with employers.
- ◆ Establish a Regional Workforce Training Coordinating Council, organized and headed by senior representatives of the business community to implement and evaluate these recommendations. The Council will include agency, education, economic, and workforce leaders and will require a small professional staff.



**Technician making adjustments at Regeneron Pharmaceuticals, Inc.**

Photo courtesy of Regeneron Pharmaceuticals, Inc., Rensselaer, NY, (property of), photography by Ted Horowitz Photography

### **3. Accelerate the way technicians and operators are trained for emerging high-tech industries.**

In light of the coming labor shortfall, we need to expedite the way we prepare technicians, both high-tech and low-tech.

- ◆ Design and establish an accelerated one-year technology-based certificate program, focusing on key skills and knowledge, to meet the needs of employers. The courses can count as credit toward a two-year degree at an accredited college.
- ◆ Establish a regional technology based learning community that links community colleges and BOCES across the region to help adult learners take advantage of the new training programs.
- ◆ Expand BOCES offerings in programs that can meet industry needs, and provide college credit and articulation agreements to facilitate associate's degrees with one year of community college. Increase the adult education component, and consider expanding technical education services to lower grades.
- ◆ Design accelerated, customized retraining programs for dislocated workers with substantial experience in related industries.
- ◆ Develop apprenticeship programs proportional to forecasted needs in emerging high growth industries.
- ◆ Support internships and on-the-job training programs.

### **4. Improve societal perceptions of two-year technical degrees.**

Many talented people prepare for, and start out at, four-year colleges where nearly half do not graduate within six years, and many who do, end up in jobs unrelated to their degree. The broad promotion of bachelor's level education over an associate's degree deprives many students of the skills and opportunities that can be derived from a community college education.

- ◆ Implement a regional education program on career opportunities and training options for the emerging high-tech industries -- targeting parents, students, and displaced workers.
- ◆ Set standards for local school districts to increase career education resources in high school and middle school.
- ◆ Implement a Regents level technical diploma that includes a rigorous and more applied education program with additional math, science, and technology requirements.
- ◆ Expand the teacher extern training program that exposes teachers to corporate and industrial careers and environments to all eleven counties.

**5. Expand the high-tech labor force by exploring ways to connect individuals who are currently outside the labor force to training and jobs.**

Given the need to bring more people into the workforce, it seems logical that efforts should be made to encourage participation by the unemployed, the underemployed, the displaced, and the discouraged.



**Using a micrometer for precision - Zak, Inc.**

Photo courtesy of Zak, Inc., Green Island, NY

- ◆ Partner with service agencies to increase outreach to older workers. Evidence suggests a fifty-year-old will stay with one company longer than a twenty-five year old will.
- ◆ Provide support for businesses, secondary schools, and community colleges willing to be training sites for older learners and other populations.
- ◆ Work with business associations, and state and local agencies to engage populations who can increase the available technology workforce.
- ◆ Increase outreach and career education at an early age to groups not fully represented in the high-tech workforce, especially minorities and women.
- ◆ Make use of existing facilities for special technology training programs serving populations not traditionally targeted, including the disenfranchised and those with special needs.
- ◆ Increase career tracks for low income workers through incumbent worker assessment and individualized training.

**6. Expedite the component of the new State Education Department (SED) / SUNY P-16 data tracking system that tracks employment outcomes for graduates.**

The SED has always tracked where high school students intend to go after graduation, but now, a system is being developed to determine what actually happens to students from pre-school through a four-year college degree. There are plans to extend the system to track results after college completion. This should be implemented as soon as possible.

- ◆ Use the data to educate students and parents about career paths and to support programs that coordinate with the needs of business, industry, and professional development.
- ◆ Establish assessments of technology/workforce skills that tie to industry needs, compare them to actual education outcomes, and use the data to allocate educational and workforce development resources more effectively.

## 7. Implement critical structural changes in K-12 education.

The Board of Regents, the Partnership for 21<sup>st</sup> Century Skills, and most of the educators with whom we spoke indicated a need to change from the old industrial model of education to one that focuses on building competencies in a contextual way. Tech Valley High School is one positive example.

- ◆ Extend the Tech Valley High School teaching methodology to other schools.
- ◆ Create three new Tech Valley High Schools in the region, one exclusively for girls.
- ◆ Provide more off-campus career training options, such as the “New Visions” program.
- ◆ Establish a career/work readiness certification for all high school diplomas and GEDs.
- ◆ Add an enhanced GED program that includes a work readiness and technology certification component.
- ◆ Require all K-16 teachers to train in the use of technology in the classroom, including virtual and immersive educational techniques.
- ◆ Develop a virtual high school pilot model, following the lead of several other states.
- ◆ Establish a fast track teaching certification process for qualified retired or mid-career changers with technology backgrounds.

## 8. Increase the effectiveness of community colleges in preparing our region’s workforce.

The five community colleges in the region represent the front line in training mid-level technicians for the jobs that will soon be available. Some structural changes will improve their performance.

- ◆ Assign a staff person with expertise on both the credit and non-credit sides of the institution to be a single point of contact for business people. Work to improve collaboration and communication among all college departments.
- ◆ Establish collaborative training models, in which students at any community college in the region can develop programs, find courses, and receive specialized training at other community colleges.
- ◆ Offer credit, degrees, and certification opportunities through the establishment of a technology-based “any campus,” with a real time course of study, using conferencing and streaming media technology.



**Orbital welding stainless steel tubing for a high purity gas delivery system by a TFS technician**

Photo courtesy of Total Facilities Solutions, Inc.,  
Watervliet, NY

- ◆ Increase flexibility in scheduling courses outside the traditional multi-course semester-based model.

**9. Examine the existing WIB structure and conduct a cost and feasibility analysis.**

Workforce investment boards have been operating for a sufficient period to warrant a comprehensive assessment, especially at a time when they will be called upon to be exceptionally productive, effective, and efficient.

- ◆ Assess WIBs in terms of effectiveness as a workforce training and service delivery agency. Also, consider the appropriate regional boundaries and whether WIBs are more effective as a regionally based model or as a sector model.
- ◆ Develop a regional workforce development training plan that maximizes limited resources and examines the elimination of duplicative administrative structures.
- ◆ Champion new programs that promote lifelong learning, in areas such as computer education, technology updates, and methods to adapt to changes in career opportunities.

**10. Support training programs to further develop the high-tech workforce.**

One of the key questions we were asked to address is where the workforce investment boards can best use their training resources to help prepare the workforce for mid-level technician positions. Some companies prefer to handle the training on their own so they can tailor it to their specific situations and also use it as an assessment tool. Others, however, preferred to have employees as job-ready as possible before hiring.

Employer-recommended training programs in each of the following areas:

- a) High level technician
- b) Lower level technician
- c) Work readiness - critical thinking/interpersonal skills
- d) Training in the green/renewable energy field
- e) Advanced construction and weatherization training
- f) Certification in laboratory science
- g) General workplace safety
- h) For the future - life long learning