



North Country Regional Economic Development Council **Workforce Development Strategy** 2022

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- Jefferson-Lewis Work Force Development Board
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- Norsk Titanium
- General Composites
- Spencer ARL
- Great Lakes Cheese
- Agri-Mark Capital
- IBEW Local 910
- Beta Technologies
- Fort Drum Transition Assistance

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North Country Regional Background and Strategies



Introduction

Project Purpose

In recognition of the workforce crisis facing businesses, Empire State Development (ESD) initiated a statewide effort to craft regional roadmaps to address those challenges. Beginning with an effort to identify each region's post-pandemic workforce needs, a Regional Workforce Inventory was completed to understand the issues from the job seeker and employers' perspective. ESD then asked each Regional Economic Development Council (REDC) to prepare a sector-based workforce development strategy that encourages collaborative solutions to critical industry workforce needs. The North Country focused on the following sectors:

- **Manufacturing**
- **Agribusiness**
- **Renewable Energy**

This effort included stakeholder engagement across the region, data collection and analysis on labor force and industry growth, and strategy development. The following report details the findings of this effort, including highlighting key themes impacting the North Country's ability to attract and retain qualified workers and strategies for addressing those challenges.

Engagement Activities

The project team worked with ESD to identify potential interviewees and collect information. The overall objective of stakeholder engagement was to inform development of actionable workforce development strategies through conversations with key stakeholders. Between September 12th and October 14th, the project team spoke with 22 stakeholders across 18 interviews.

Data Analysis

The project team conducted analysis to evaluate the current environment of the region and to estimate the workforce, training, and skills gaps within each tradable cluster. This analysis included:

Background Analysis: Provided background and context for the creation of targeted workforce development strategies for key, tradable industry clusters within the region.

Industry Sector Definition: Included all of the 6-digit industries within each cluster.

Staffing Pattern Analysis: Detailed the unique occupational makeup of each industry, which allows us to evaluate the workforce needs of each cluster.

Workforce Gap Analysis: Estimated the gap between the projected supply of workers and the projected new job openings over the next 10 years to determine which occupations are likely to have the largest workforce shortages in the near future. The Top Gap Occupations are the primary focus of the workforce development strategies.

Training Gap Analysis: Identified the training pipeline for the Top Occupations (i.e., those with the largest gaps). For each of the Top Occupation Gaps, the training providers within the region that offer programs related to that occupation (based on a SOC-to-CIP crosswalk) are shown. Not all of the Top Occupations require formal training beyond a high school diploma.

Skills Gap Analysis: Showed the most in-demand skills compared to the skills most commonly held by workers within each cluster.

All data was sourced from Lightcast (formerly EMSI/Burning Glass) and is for 2021 unless otherwise noted.

What we heard

Interviews conducted brought forward important information from employers and service providers about the critical issues in the North Country.

- Employers struggle to meet the needs of a “modern workforce,” which they indicated meant the need for flexibility and dynamic work environments, increasing employee compensation, and embracing work/life balance.
 - The combined challenges of low-wages, lack of transportation, and lack of child care forces many people to make trade-offs that sideline an otherwise available segment of the workforce.
 - Complicated administrative logistics impact ability to offer wrap-around services.
 - Funding for training is too restrictive in terms of what can be offered and who can be served, creating a situation where many in the population cannot afford training programs, but do not qualify for free or subsidized trainings.
 - Community colleges are a critical player in much of the workforce development efforts of the region, but there remains a challenge offering programs that are not considered credit/technical programs because funding is tied to the number of students enrolled in credit courses.
 - There is a mismatch between the skills that employers need and the resources necessary to train people.
 - Interviewees noted a general lack of awareness of available training programs and not enough industry experts to do the teaching.
 - Often uncertainty about whether there is truly enough demand for the skill to justify the training.
 - Training programs with employer funding matches can be challenging because it is asking employers to take on people they haven’t vetted.
-

Strategies used to attract and retain employees in the region:

- Internships
- Recruitment through NYSDOL and firms
- Focusing on women and empty nesters
- Hiring a full-time recruiter on staff
- Job fairs at colleges (Clinton Community College, SUNY Plattsburgh, CV-TECH, Clarkson, SUNY Canton)
- Partnerships with K-12, spending time in high schools
- Recruiting retirees
- Pay increases, flexibility in schedules
- Team cross-training that gives employees exposure and experience in various parts of a company
- Internal growth opportunities
- Offer [Behavior Health Service North](#) free to employees
- Sign in the window that says “now hiring”
- Recruiting Fort Drum discharges, partnering with Hire a Hero program

What we discovered

Demographics

- The region has seen a population decline.
- There are fewer millennials in the population than expected; some counties within the region are significantly older than the state and nation.
- Racial diversity is low but increasing slowly.
- Educational attainment (Bachelor's degree or higher) is significantly lower than the state and the nation; the high school graduation is slightly lower than the state's rate while the dropout rate is equal to the state's rate.
- Median household income varies across the region and some counties have significantly higher poverty than the state and the nation.

Economy

- Jobs have been in decline, but nearly 83% of those jobs are projected to be recovered by 2026.
- While average earnings have increased significantly, they are still lower than the national and state average.
- The region's share of the state's Gross Regional Product is low relative to its share of population and jobs.
- Federal Government, Military, Other Individual and Family Services, Colleges, Universities, and Professional Schools (State Government – public higher education institutions run by the state) are some of the region's top industries in terms of job growth, concentration, and competitiveness.

Labor Force

- Labor force participation has not yet recovered to pre-pandemic levels.
- Similar to other areas in New York, unemployment is at its lowest since at least 2017.
- Over 23% of the population is overqualified for the types of jobs employers are offering.
- College enrollments and completions are declining; over 16% of completions are via distance learning and 5% are for certificates.
- The top common skills point to strengths in customer service and Microsoft office, while specialized skills indicate workforce strengths in white collar jobs.
- Most commuters remain within the state for work and have a relatively short commute time.
- The region has a slightly larger proportion of young workers than at the state or national levels; however, the age of the workforce is increasing, in keeping with state and national trends.
- The region's workforce is less diverse than the state or nation but has made gains over the past 5 years, especially among Hispanic or Latino workers.
- There are 10 underserved populations with higher jobless rates than the overall workforce. They could potentially be activated within the workforce given the right support and circumstances. The vast majority of these individuals are not currently participating in the workforce (as opposed to unemployed).
- The underserved populations that have the highest jobless rates include older workers (who may or may not be retired), females below the poverty line, and Black or African American workers. The underserved populations that would have the greatest impact in terms of expanding the workforce include older workers, individuals with disabilities, teens, and females below the poverty line.

Demographics



Population
409,518

- 2.1% of the state's population
- **Decreased by 13,771 over the last 5 years** (-3.3%, compared to -1.7% for the state and 2.7% for the US)
- **Projected to decrease by 16,053 over the next 5 years** (-3.9%, compared to -1.8% for the state and 2.6% for the nation)



Median Age
32.8–55.5
Range across region

- With a range of 22.7 years, **median age varies widely across the region** (lowest: Jefferson County; highest: Hamilton County)
- 5 of the 7 counties are older than the state (39.0) and 6 are older than the nation (38.2)
- **Fewer millennials than expected** for a population this size (80,593 compared to 84,994)
- **Average retirement risk** for a population this size (131,864 compared to 122,755)



Diversity
12.2%
BIPOC Share of Population

- **Decreased by 536 over the last 5 years** (-1.1% compared to +1.3% for the state and +1.9% for the US)
- **Racial diversity is lower than expected** for a population this size (50,122 racially diverse people compared to 166,126)



Educational Attainment
23.3%
Bachelor's Degree +

- 14.4% **lower than the state** attainment rate of 37.7%, and 9.9% **lower than the national rate** of 33.2%
- The **high school graduation rate is 87.8%** (+3.9% increase since 2011), which is **slightly lower than the state's rate** (88.0%) *
- The **high school dropout rate is 8.0%** (0.9% decrease since 2011), which is **equal to the state's rate** (8.0%) *



Household Income
\$52,071–\$60,625
Range across region

- With a range of \$8,554, **median household income varies across the region** (lowest: St. Lawrence County; highest: Hamilton County)
- **All 7 counties have lower household incomes than the state** (\$71,117) **and the nation** (\$64,994)
- Poverty rate ranges from 1.4% (Hamilton County) to 13.2% (Franklin County); 2 of the 7 counties have more poverty than the state (10.0%) while 4 have more poverty than the nation (9.1%)



Average Net Migration
-3,301
2016 - 2020

- **In 2020, 26.3% of in-migration originated within the state, while 19.2% of out-migration remained within the state**
- In 2020, top originating counties included: Onondaga County, NY (2.2%), Oneida County, NY (2.1%), El Paso County, TX (1.9%)
- In 2020, top destination counties included: Onondaga County, NY (2.5%), El Paso County, CO (2.2%), Bell County, TX (1.8%)

* 6-year outcomes, NY State Education Department

Economy



Jobs
174,704

- 1.8% of the state's jobs
- **Projected to grow by +5,366 over the next 5 years** (+3.1% compared to +3.0% in the state and +4.3% in the nation)
- **82.5% of the jobs lost in the past 5 years are projected to be recovered by 2026**



Average Earnings
\$64,913

- **\$36,205 below the state average** of \$101,118 and **\$12,886 below the national average** earnings of \$77,799
- **Grew by 21.6% since 2016** (average growth of 26.2% across all industries)



Gross Regional Product
\$23.6 B

- 1.3% of the state's GRP, which is low relative to the region's share of the state's population (2.1%) and jobs (1.8%)
- **Productivity is at \$135,217 per worker.**



Competitiveness
-5,774
*jobs added or lost due to local factors **

- Federal Government, Military: +1,689
- Colleges, Universities, and Professional Schools (State Government): +773
- Other Individual and Family Services: +552
- Other Building Material Dealers: +331
- All Other Support Services: +232

* i.e., job growth or decline cannot be explained by national or industry growth



High Concentration*
Industries

- Alumina Refining and Primary Aluminum Production: 80.6
- Residential Electric Lighting Fixture Manufacturing: 18.7
- Hydroelectric Power Generation: 18.0
- Paper (except Newsprint) Mills: 17.6
- All Other Nonmetallic Mineral Mining: 16.7

* Compares an industry's share of regional employment with its share at the national level. A LQ of 2.5 would mean the industry is 2.5x more concentrated in the region than in the nation.



High Growth Industries
2016 -2021

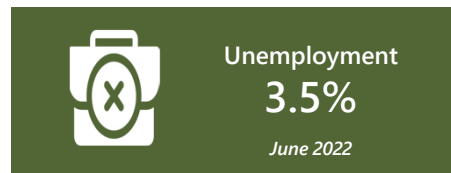
- Federal Government, Military: +1,150 jobs (8% growth)
- Other Individual and Family Services: +654 (64%)
- Colleges, Universities, and Professional Schools (State Government): +643 (23%)
- All Other General Merchandise Stores: +378 (51%)
- Animal Production: +368 (13%)

Labor Force



- 1.8% of the state's labor force
- **Labor force participation rate* of 55.8%**, which is 4.3% **lower than the state** (60.1%), and 6.7% **lower than the nation** (62.5%)
- **Participation rates have not yet recovered to the pre-pandemic rate of 56.8%** (2019)
- **138,586 missing workers** (not in the labor force), which accounts for 2.2% of the state's total; 44.1% of missing workers are 65+

* Includes the civilian, noninstitutionalized population 16+



- Unemployment rates are historically low
- Unemployment is 0.9% **lower than the state** (4.4%) and 0.3% **lower than the nation** (3.8%)
- **6,069 workers are unemployed**, which accounts for 1.4% of the state's total
- 46.8% of the unemployed are between the ages of 25 and 44, while 19.9% are BIPOC



- Underemployment is 1.6% **lower than the state** (25.3%) and 2.5% **lower than the nation** (26.2%)
- There are 8% more people with Some College, Non-Degree Awards than required by employers; 10% more with an Associate's Degree; and 5% more with a Graduate Degree or Higher

* Underemployment = Population at Educational Level – Jobs Requiring Educational Level



- 12 institutions operating within the region
- 23,761 enrollments in 2020 (13.4% decrease since 2016)
- 6,563 completions in 2020 (-7.5%)
- **16.2% of completions in 2020 were in distance programs** (+44.0%)
- **94.8% of completions were for degrees**; 6,225 degrees were awarded in 2020 (-6.9%)
- **5.2% of completions were for certificates**; 338 certificates were awarded in 2020 (-17.4%)



Specialized:

- Strategic Planning (5%)
- Marketing (5%)
- Event Planning (4%)
- Community Outreach (3%)
- Sales Management (2%)

Common:

- Customer Service (13%)
- Microsoft Office (10%)
- Management (10%)
- Sales (9%)
- Leadership (9%)

* Profile analytics mine data from the 85,886 online resumes that list the Region as the place of residence (49.2% of all jobs in the region).

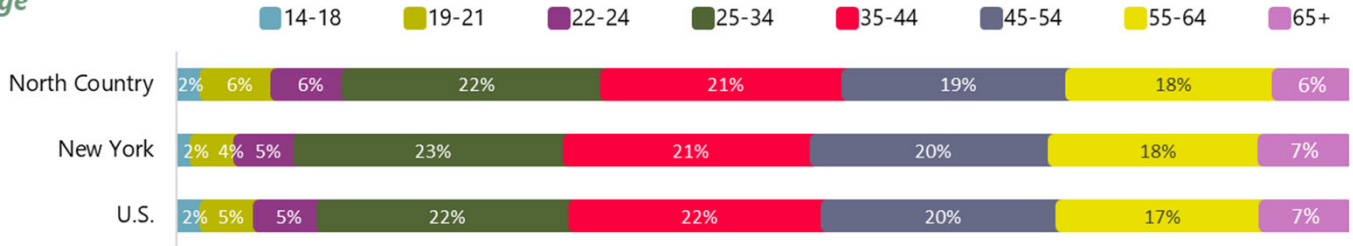


- **16,452 inbound commuters (1.1% from out of state) and 23,315 outbound commuters (0.4% head out of state)**
- Top origins: Oneida County, NY (14.5%), Onondaga County, NY (11.7%), Oswego County, NY (9.4%)
- Top destinations: Onondaga County, NY (15.8%), Oneida County, NY (13.2%), and Albany County, NY (8.6%)
- All 7 counties have quicker commutes than the nation (26.9 min) and the state average (33.5 min)

Labor Force Demographics

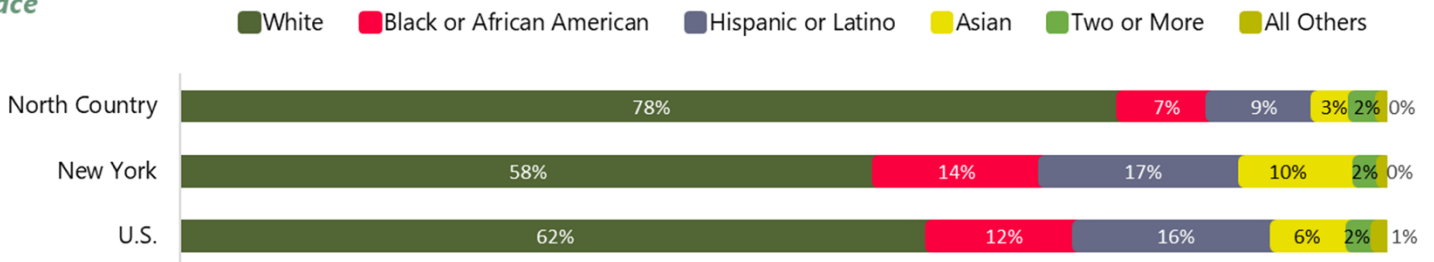
The graphs below show the demographic distribution of the North Country's workforce by age, race, and sex.

Age



The North Country's workforce is slightly younger than at the state and national levels, with teen and young adult workers (ages 14–24) accounting for 15% of the workforce, compared to 10% and 12% respectively.

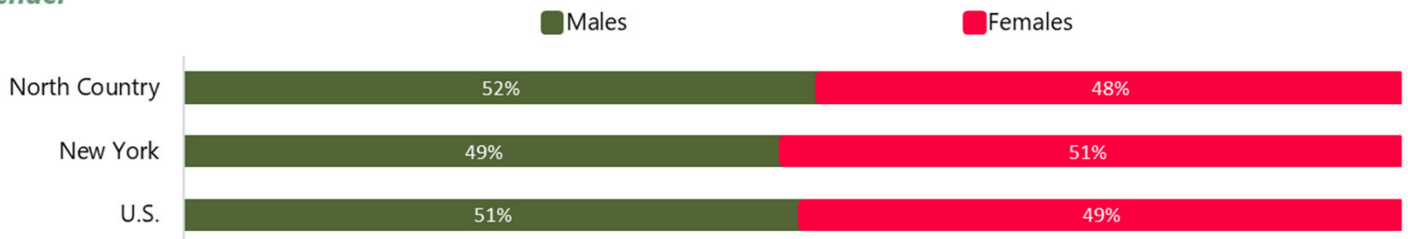
Race



"All Others" includes American Indian, Alaska Native, Native Hawaiian, or Other Pacific Islander

The racial composition of the North Country's workforce is significantly less diverse than the state or the nation, with only 22% BIPOC workers compared to 42% for the state and 38% for the nation. However, the region's workforce is diversifying at a slightly faster pace, with a 2.5% increase in BIPOC workers in the past 5 years, compared to 1.8% for the state and 2.3% for the nation. The largest gains were in Hispanic or Latino workers (1.4% increase since 2016).

Gender



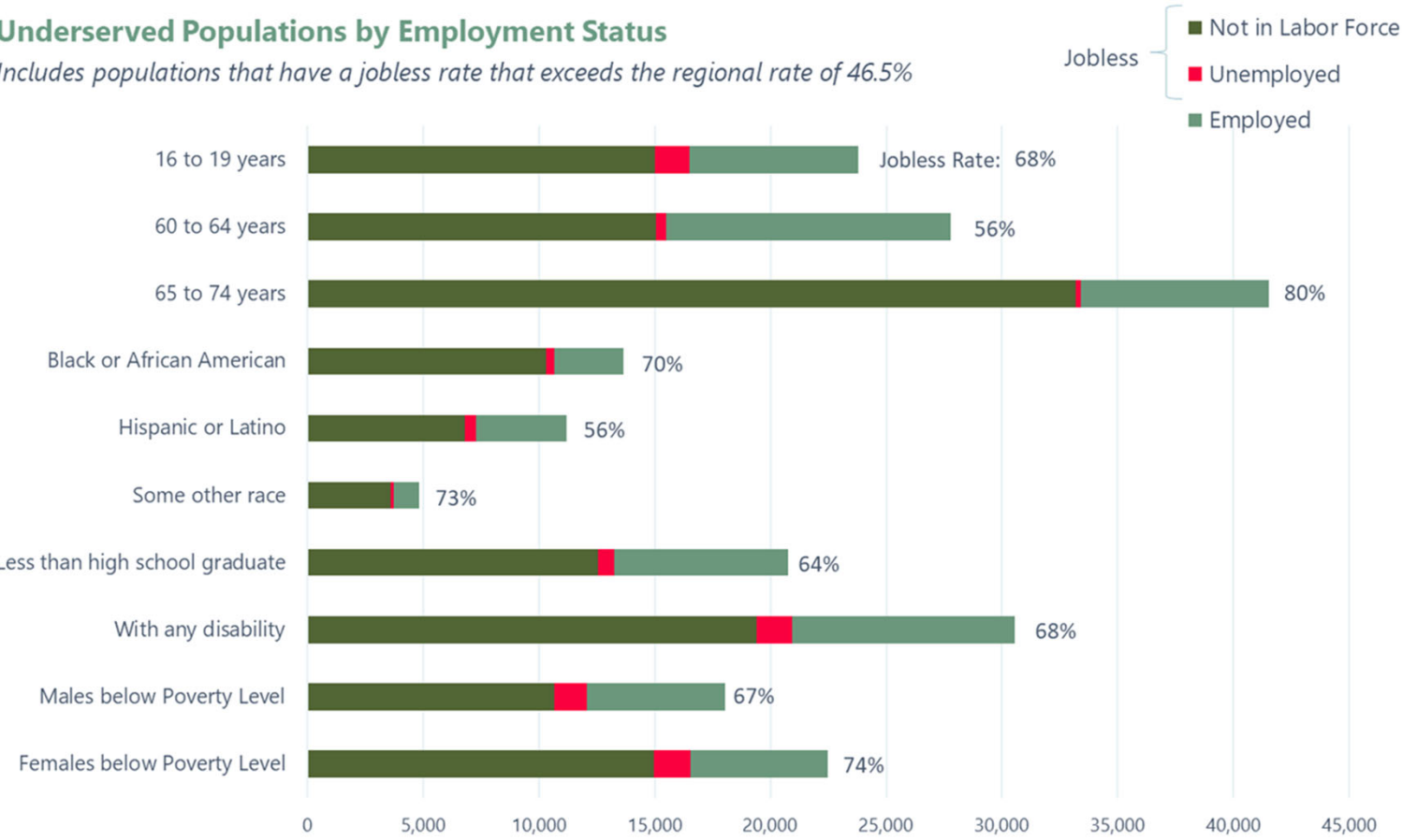
The North Country's workforce gender distribution is slightly skewed towards males compared to the state and the nation. The gender distribution of workers has remained fairly consistent over the past 5 years for all 3 regions of analysis.

Underserved Populations

The graph below shows the underserved populations that have a jobless rate that exceeds that of the region as a whole. Jobless workers – which includes both the unemployed and those who are not currently seeking employment – represent an opportunity to expand the workforce both in terms of additional workers and inclusivity and equity. There are 10 underserved populations with higher jobless rates than the overall workforce. They **could potentially be activated within the workforce** given the right support and circumstances (a person could fall within multiple categories, e.g. aged 65–74 and Some other race). Among these 10 populations, 94% of the jobless are not in the labor force while 6% are unemployed. The underserved populations that have the highest jobless rates include older individuals (who may or may not be retired), females below the poverty line, and Black or African American workers. Based on the number of jobless in each group, **the underserved populations that would have the greatest impact in terms of expanding the workforce include older individuals, individuals with disabilities, teens, and females below the poverty line**. Populations that are participating in the labor force more than the overall regional rate include age groups 20 through 59 years old, individuals with at least a high school education, veterans, parents, and formerly incarcerated individuals.

Underserved Populations by Employment Status

Includes populations that have a jobless rate that exceeds the regional rate of 46.5%



Source: American Community Survey, 5 Year Estimates, 2020; Jobless = Not in Labor Force + Unemployed

Regional Findings

The data, interviews, and research identified four themes that represent opportunities to close gaps in the workforce development pipeline across all sectors of the economy in the North Country. Those themes are detailed below and addressed in the following initiatives and strategies.

Available workforce

Employers in the North Country are struggling to attract and retain employees for their numerous open positions. Expanding the number of individuals participating in the workforce, through attraction, retention, and activation will improve employers' ability to have adequate candidate pools.

Career ready skills

The current education pipeline is not preparing graduates for life after high school and additional resources will be required to meet the current and future demand of employers. Employer interviews and data suggests that there is a need for greater attention to basic skills needed to get and keep a job.

Wrap around services

Employers and employees are challenged by the inability to access services to make employment possible. Child and elder care, transportation, telecommunications infrastructure, housing, and other services are needed to expand the ability for residents to participate in the workforce.

Connection with Fort Drum

With hundreds of individuals being discharged every month, transitioning soldiers and their families are a source of potential workers for industries throughout the entire region. Addressing issues, related to housing and on-ramping into private sector employment, will increase the pool of skilled applicants.

Implementation Plan: Regional Strategies

The implementation strategy recommends a series of projects and initiatives to develop the pipeline of workers. Details and tactics for each of the initiatives are provided in the following pages.

These recommendations align with the needs and opportunities identified throughout the planning process as well as the stakeholder feedback.

#	Initiative	Description	Partners
1	Improve access and affordability of employment	Strategies to address critical barriers to employment such as child care and transportation.	Office of Children and Family Services, Child Care Resource & Referral Agencies, Community Colleges, Employers, Board of Cooperative Education Services (BOCES)
2	Develop career ready skills	Strategies to address employability skills of residents.	Higher Education Institutions, Department of Education, K-12 Educators, BOCES, Parents, Employers, Workforce Development Boards
3	Activate underserved populations	Strategies to engage portions of the population that are underrepresented in the current workforce.	Higher Education Institutions, Department of Education, K-12 Educators, BOCES, Parents, Employers, Workforce Development Boards
4	Build modern hiring and retention strategies	Strategies to enhance the ability for employers to attract and retain quality staff.	North Country Human Resources Association, Employers, Higher Education Institutions
5	Create pathways for military families	Strategies to create a stronger connection between Fort Drum and employment opportunities throughout the region	Fort Drum, Advocate Drum, Regional Economic Development and Workforce Development Professionals, Employers

This plan is designed to identify the priorities of the North Country Regional Economic Development Council. Implementation of the Workforce Development Plan will require coordination, cooperation, and investment from many different organizations throughout the region.

Improve Access & Affordability of Employment

INITIATIVE 1

Breaking down the barriers to employment will increase the overall labor pool to serve employers in the North Country in all industries. Child care and transportation are two of the largest issues faced by the workforce.

STRATEGY 1.1

Address Lack of Child Care Options

Tactic: Work with local colleges, BOCES, North Franklin Educational Center, Child Care Resource & Referral Agencies and others to expand affordable and efficient credentialing for child care workforce, including potential to combine with business training.

Tactic: Increase awareness among employers about role they can play in increasing access for staff. Create inventory of best practices and creative solutions.

Tactic: Build educational pipeline from the classroom to child care occupations. Create a cohort of individuals interested in pursuing home-based/family daycare centers to go through the process together, learn from one another, and provide support once up and running.

- Consider feasibility of apprenticeship programs (collaborate with the Office of Children and Family Services on licensing/regulations)
- Provide business training

What Businesses Are Saying:

Wrap around services needed most:

- Child care and early childhood education
- Transportation
- Life skills (budgeting, etc..)

STRATEGY 1.2

Address Lack of Transportation

Tactic: Conduct assessment of current transportation assets and any underutilized assets that could be redeployed.

Tactic: Identify pockets of workers, especially underserved populations, and study potential to establish van share or expanded public transportation options. Expand use of 511NYRideShare program to promote and expand opportunities.

Tactic: Create a program that pays employees to get their driver's license and then become drivers for vanpools to remote employment centers (vans provided by program).

Tactic: Expand existing vehicle loaner program throughout the North Country.

What Businesses Are Saying:

"If there was a rental car opportunity, that would make it easier for employees to get to work if their car breaks down. Loaner vehicles that are affordable would make all the difference so that employees can get to work and continue to earn."

Develop Career Ready Skills

INITIATIVE 2

Regional employers have noted that they need applicants and employees that have skills to work as part of a team, complete routine and basic tasks, and are committed to the work. Career ready skills are sometimes called soft skills or employability skills.

STRATEGY 2.1

Create greater awareness throughout school districts about what skills are most critical coming out of high school.

Tactic: Work with school districts, local community colleges, HR professionals, BOCES, and others to design curriculum that address issues such as basic computer skills, resume building, interviewing, employer expectations, role playing, hybrid working, etc.. Build into standard curriculum requirements for students not going to college.

Tactic: Expand student access to virtual classrooms, sharing resources between districts, and creating standardized curriculum that can be implemented as part of existing courses.

Tactic: Communicate importance with New York State Education Department, school boards, guidance counselors, teachers, and parents about need to focus on career readiness and non-college alternatives.

Tactic: Engage local libraries and other community gathering places to host events for adult learners in need of career readiness and personal development.

Tactic: Host "Teacher Tours" and industry days to have middle and high school teachers and career counselors tour regional businesses to learn about what industries are available in the region and what opportunities exist for students

STRATEGY 2.2

Create micro credentialing programs to improve overall digital literacy.

Tactic: Work with local community colleges and other resource providers to expand and replicate programs to address changing digital skill needs.

STRATEGY 2.3

Engage teachers, guidance counselors, coaches, and other education professionals in adopting a career mindset that includes non-college options.

Tactic: Celebrate students matching with employers after high school, going on to apprenticeship and community college programs, and pursuing alternative options. Increase representation for younger students to see opportunity.

Tactic: Expand articulation agreements with regional educational institutions to establish dual credit programs between high schools and postsecondary education. This will allow students to go straight to employment if they want or to have a jumpstart on their postsecondary education.

Activate Underserved Populations

INITIATIVE 3

There are opportunities to expand representation of some groups of the North Country population that are not currently engaged with the workforce. By activating these residents, it will be possible to address some of the workforce shortages and help improve their lives.

STRATEGY 3.1

Train employers and human resource professionals on how to handle unique situations associated with special populations.

Tactic: Create a guidebook that provides information on how best to manage those reentering the workforce. Include legal guidance, special accommodations needed for certain populations, how to address issues that might come up, unconscious bias, and resources for additional support.

Tactic: Provide examples and details on part time or other approaches/benefits that might bring older workers, caregivers, or those looking for more flexibility back into the workforce.

Tactic: Give information to service providers that details job description, on-site accommodations, and training available to underserved populations for their distribution.

Resource: [Center for Workforce Inclusion](#)

STRATEGY 3.2

Invest in onramp for employment for underserved populations.

Tactic: Provide support around how to update resumes to clearly articulate how past experiences and skills translate into current employer needs.

Tactic: Establish pre-apprenticeship and pre-work programs to facilitate smooth transition and success.

Tactic: Provide training, child care, benefits counseling, accommodation advocacy, and other support to ensure accessibility to onramp programming.

STRATEGY 3.3

Establish female-safe work environments and training initiatives.

Tactic Fund emergency daycare back up options.

Tactic Provide flexibility and support for those with children in school, flexible time, part time, on-site child care during school breaks.

Tactic Address and eliminate any sexual harassment or discrimination, including training employers on how to avoid bias in the hiring process.

Build Modern Hiring and Retention Strategies

INITIATIVE 4

Employers are recognizing a need to adjust their hiring and retention approaches to attract and retain workers. Responding to changing employee needs is critical to ensuring a ready, willing, and able workforce.

STRATEGY 4.1

Support the work of the North Country Human Resources Association.

Tactic: Support NCHRA's work to address issues in the North Country and build a supportive network for HR professionals dealing with challenges.

Tactic: Establish a clearinghouse of unique approaches to employee benefits that are working in the region to share information and improve overall ability of the region to retain employees.

STRATEGY 4.2

Conduct research into the impact of high turnover and why flexibility and better work environments are key to retention and lower expenses.

Tactic: Offer funds to update employee handbooks, orientation, onboarding, and professional development programs.

Tactic: Work with employers to understand the impact of low wages and incomplete benefit packages on their ability to successfully attract and retain. Fund employers that are conducting a regular assessment of how they are doing, retention rate, and opportunities for improvement.

STRATEGY 4.3

Retain (and attract back) college educated students in the North Country.

Tactic: Invest in programs that connect higher education students, especially those from underserved populations, with employers for jobs during and after school.

Tactic: Investigate the potential for tuition reimbursement for students that remain in the North Country following graduation for a certain number of years in target occupations.

Tactic: Invest in housing of all types throughout the North Country to meet the demand.

Tactic: Conduct a data driven geographic assessment to identify individuals for attraction to the North Country that have the needed advanced degrees. Help with moving costs and other expenses associated with either moving to the North Country or setting up as a remote worker.

STRATEGY 4.4

Address training for middle skill employees and residents.

Tactic: Create subsidy for training programs that make reskilling, upskilling, and professional development possible for middle income individuals.

Create Pathways for Military Families

INITIATIVE 5

Fort Drum provides a consistent source of potential workers as hundreds of military members are discharged each month. These individuals have received training and are well suited to meet the needs of employers across the entire region if they are able to make connections in the North Country.

STRATEGY 5.1

Initiate communication with Army personnel and their families earlier to establish connections for when they are discharged.

Tactic: Take initiative in finding housing, jobs, and community connections within the North Country to ease the transition for military personnel.

Tactic: Provide training, direct connections, and support throughout the job search process to help navigate how to translate military experience to civilian workforce.

Tactic: Expand collaborations between regional education institutions and the Fort Drum's Solider for Life-Transition Assistance Program.

Example: SUNY Poly Northeast Advanced Technology Education Center's Advanced Manufacturing Technician Training

U.S. Department of Defense provides support to the military community for transition following their military career and for military families. Some support includes Transition Assistance, Tuition Assistance, and details on employment opportunities.

STRATEGY 5.2

Facilitate conversations regarding the ability to use military training capabilities for civilians in target occupations.

Tactic: Identify specific training needs throughout the region (such as electricians, welders, and machinists) and see if there is training or facilities at Fort Drum that could be used.

STRATEGY 5.3

Promote opportunities throughout the North Country for military families to relocate following service.

Tactic: Establish an inventory of the employers throughout the North Country that would be a good fit for ex-military and bring them to the base to promote their openings.

Tactic: Work to establish a clear connection between experiences in the military to the training and experience requirements of civilian companies for both the employers and employees.

2

North Country **Manufacturing Cluster** **Research and Strategies**



Background Information

Purpose

This workforce strategy for Manufacturing builds off the Regional Workforce Inventory completed by the Regional Council.

What follows are solution-driven approaches for workforce development and a roadmap for how to address the needs of the Manufacturing businesses in the North Country. A specific area of focus within the Manufacturing cluster for the North Country is around **Transportation Equipment Manufacturing, which is an important subsector for the region.**

Sector Definition

The Manufacturing cluster includes occupations involved with making products from raw materials by the use of manual labor or machinery. It includes the previously identified target subsector of Transportation Equipment Manufacturing, which accounts for 11% of Manufacturing jobs and 6% of its business establishments.

Cluster Companies

Major employers in this sector include:

- Arconic
- Agri-Mark
- Spencer ARL
- Corning
- New York Air Brake
- Car-Freshner Corporation
- Sylvamo
- Alstrom (Bombardier)
- Novabus
- Mold Rite Plastics
- Alcoa
- Knowlton Technologies

Why Manufacturing sector?

The Manufacturing cluster is a critical element of the North Country's economy.

Significant Employment

7,951

jobs, 4.6% of the
region's employment

Notable Businesses

231

establishments,
share of 2.3%

Specialized

11.90

average LQ, highest
subsector LQ of 80.6

From REDC 2022 Annual Report

Advanced manufacturing builds on our existing transportation equipment cluster as well as legacy manufacturers across the region that rely on similar skill sets. This sector tends to support higher paying jobs and involves more intensive capital investment, thereby creating a strong economic impact.

The **greatest challenge facing these companies is the workforce skills gap** that already existed and was exacerbated by the pandemic. The need for a skilled workforce is now compounded by trends in smart manufacturing and the growing utilization of artificial intelligence and robotics, especially as we see more onshoring of production for supply chain security and reliability. It is therefore imperative that we do all we can to build on the foundation we have and develop the workforce needed to support these growth opportunities.

What we heard

The team conducted 14 interviews that addressed the Manufacturing cluster, including private employers, educators, and workforce development entities. Many of the challenges listed in the What we Heard section for the North Country as a whole are especially relevant to the Manufacturing cluster.

Manufacturing Challenges:

- Lack of awareness about opportunities in the industry and about specific companies
- Low wages in this sector relative to others, employers not always able to make increases
- Perception of a transient, non-committed workforce
- Absenteeism among employees
- Perception that educators are encouraging young people to leave the area
- Small manufacturing companies have a harder time staying competitive with wages
- Lack of opportunities to move up in a company
- High turnover during pandemic
- Many companies do not know how to engage Fort Drum
- Companies have to recruit from larger radii, which creates longer commutes
- Shift work and overtime demands are not conducive to family obligations or health (especially rotating shifts or “southern swing”). This makes it very difficult to recruit women especially.

Skills Needed:

- Machinists/skilled machine operators
- Material science/engineering
- People with welding and electrical background
- People who are committed to come to work
- People with management experience
- Soft skills: transferable professional and communications skills
- Industrial math skills
- Programming and code
- Teamwork and team interactions
- Purchasing and accounting
- Apprentice machinists and electricians

What Businesses Are Saying:

“We would like a minimum high school education and maybe some level of college. But we’ve had to eliminate the requirement for high school education because we weren’t attracting enough people.”

What we discovered

The majority of the cluster's jobs are in low-skill occupations

The cluster has 108 occupations with at least 10 jobs. Transportation Equipment has 8 of its top 15 occupations in common with the overall Manufacturing cluster.

Occupational Mix:

- 44% Production occupations
- 10% Office and Administrative Support occupations
- 10% Architecture and Engineering occupations
- 37% Other occupations

Low-Skill Occupations:

- 76% of the jobs in this cluster
- Wages range from \$14.53–\$33.06
- 84% of jobs have above-average risk of automation

Middle-Skill Occupations:

- 13% of the jobs in this cluster
- Wages range from \$20.04–\$31.89
- 91% of jobs have above average risk of automation

High-Skill Jobs:

- 12% of the jobs in this cluster
- Wages range from \$24.34–\$71.86
- 0% of jobs have above average-risk of automation

Shortage of in-demand skills, particularly for common (or soft) skills

There are 62 skills categories where employer demand exceeds worker supply, based on online job postings and worker profiles.

Top Skills Gaps:

- *Specialized Skills:* Warehousing, Merchandising, Auditing, Finance, Carpentry
- *Qualifications:* CDL, OSHA, Six Sigma, Master of Business Administration, Certified Public Accountant
- *Common Skills:* Communications, Operations, Customer Service, Management, Problem Solving

Significant gaps across all occupations, particularly among low skill jobs

Projected workforce gap (2022–2032): (8,740)

$$\left\{ \begin{array}{l} \text{Openings} - \text{Change in Labor Force} = \text{Workforce Gap} \\ 8,034 - (706) = (8,740) \end{array} \right\}$$

Gaps projected across all 108 occupations in the cluster; gaps are particularly concentrated for Miscellaneous Assemblers and Fabricators (11.0% of the gap), Laborers and Freight, Stock, and Material Moving, Hand (4.8%), First-Line Supervisors of Production and Operating Workers (4.6%), and Electrical, Electronic, and Electromechanical Assemblers (4.2%)

Of the projected workforce gap:

- 78% are Low Skill
- 12% are Middle Skill
- 10% are High Skill

Twelve of the 22 Top Gap Occupations are plotted on the next page. Half of the Top Gap Occupations overlap with the Transportation Equipment Manufacturing subsector.

There are training programs available for the Top Gap Occupations that require formal training, but few do

Only 2 of the 22 Top Gap Occupations require beyond a high school diploma (or equivalent) for entry (General and Operations Managers and truck drivers).

Types of Programs:

- *Higher Education:* 113 active training programs related to the Top Gap Occupations (whether they require it or not) producing an average of 1,493 graduates who are likely to remain in region (however, this cluster will be competing with all other industries for these workers)
- *Apprenticeships:* 4 (3 for Machinists & 1 for CDL; unknown completions)
- *Certifications:* 5 (2 for CDL, 2 for Welding, 1 for Machinists; unknown completions)
- *Other Programs:* 5 (2 for CDL, 2 for Welding, 1 for Machinists; unknown completions)

More information needed regarding employer need and capacity for training programs for low- and middle-skill occupations

What we discovered

Of the 22 Top Gap Occupations, the 12 with the largest gaps are plotted by: **Skill Level** (x axis, industries are coded by skill color), **Earnings** (y axis), and **Projected Average Annual Workforce Gap** (bubble size), with average hourly earnings and the gap included in the data labels. These 12 occupations account for 45.9% of the total gaps anticipated in this cluster (the full 22 Top Gap Occupations account for 62.0%).

Top Gap Occupations: Manufacturing



Manufacturing Findings

The following two themes are specific to the Manufacturing cluster and the critical issues businesses are facing. Overall, the Manufacturing cluster needs workers of all skills and abilities, from laborers to managers. Building the pipeline of quality, reliable workers is essential to continuing to advance and build this sector in the North Country. These themes are addressed in the following initiatives and strategies.

Laborers and logistics professionals

Data suggests that the Manufacturing cluster is in significant need of a wide variety of occupations, ranging from general laborers, to supervisors, and truck drivers. There is a need to increase capacity of formal and informal training programs to serve this cluster in the region, including more apprenticeships and on the job training resources. Specifically, CDL drivers and trades workers are in high demand to serve the Manufacturing cluster in the North Country.

Perception of the Manufacturing industry

The perception of the Manufacturing cluster has impacted the ability for current companies to attract and retain staff, even as work environments have improved. Raising awareness of opportunities, career pathways, and growth potential will be critical to establishing a strong pipeline.

Implementation Plan: Manufacturing Strategies

The Manufacturing cluster implementation strategy recommends a series of projects and initiatives to develop the pipeline of workers. Details and tactics for each of the initiatives are provided in the following pages.

These recommendations align with the needs and opportunities identified throughout the planning process as well as the stakeholder feedback.

#	Initiative	Description	Partners
6	Improve awareness of Manufacturing careers	Strategies to increase awareness of careers within the Manufacturing cluster to expand the potential applicant pool.	Department of Education, K-12 Educators, BOCES, Parents, Employers, Workforce Development Boards, National Associations
7	Expand Manufacturing training programs	Strategies to increase access and availability of Manufacturing cluster related training opportunities to ensure the workforce has the skills needed to succeed.	Higher Education Institutions, Department of Education, K-12 Educators, BOCES, Parents, Employers, Workforce Development Boards

Expand Awareness of Manufacturing Career Path

INITIATIVE 6

The North Country has a strong history of manufacturing and a lot of growth potential in subsectors like transportation equipment manufacturing. Expanding awareness of opportunities and more modern work environments is critical to expanding the labor pool.

STRATEGY 6.1

Annually engage 3rd grade and above to promote opportunities and create greater visibility.

Tactic: Coordinate with regional and national industry associations to design outreach, prepare materials, and establish messaging.

Tactic: Facilitate annual visitation from industry employers to grade schools to present opportunities and build awareness

- Encourage employers to identify students that might be a good fit for their company and begin the conversation and mentorship.
- Create opportunities for sponsorships of various activities, clubs, and events to expand awareness of the regional employers.

STRATEGY 6.2

Continue to fund and expand K-12 programs that introduce students to STEAM careers.

Tactic: Expand and promote existing programs such as Career Jam, Manufacturing Day, Authentic STEM, STEAM Day at the Ballpark, STEM initiatives, MASH Camps, and localized CDL training

Tactic: Assess, improve, and expand Career Technical Education programs like Ready4Real, Authentic STEM and RAMP program to increase awareness of opportunities and potential careers.

STRATEGY 6.3

Expand coordination with Workforce Development Boards (WDB) to recruit workers.

Tactic: Facilitate WDB to host job fairs and connect workers with open positions. Encourage parents to attend and make them part of the conversation around the changing nature of manufacturing and pathways to employment.

Tactic: Increase awareness of employers about what resources exist for on-the-job training, and other resources through the WDB.

STRATEGY 6.4

Strengthen connection between education and industry.

Tactic: Facilitate an annual meeting to discuss opportunities/gaps and emerging trends impacting the manufacturing sector in the North Country.

Tactic: Identify students that are graduating from North Country colleges with degrees needed by the cluster, such as MBA and CPA and work to retain them at North Country employers. Facilitate cross-institution agreements as needed to address shortage.

Expand Manufacturing Training Programs

INITIATIVE 7

The North Country has a wide variety of training programs and partners to service the Manufacturing cluster, however there are specific occupations and skills that are in high demand across sectors that would benefit from increased training capacity and funding.

STRATEGY 7.1

Expand apprenticeship programs for electricians.

Tactic: Create an inventory of current programs and capacity. Identify opportunities to expand and work to fund and promote.

Tactic: Fund new and expanded apprenticeship programs, including more mentors to provide the training.

Tactic: Consider a temporary adjustment to apprenticeship ratio requirements to expand the training capacity.

STRATEGY 7.2

Offer additional CDL training.

Tactic: Coordinate with current employers about needs and potential cooperative approaches to increasing capacity of training programs.

Regional Educational Partners Training Top Gap Occupations:

- Clarkson University
- Clinton Community College
- Clinton Essex Warren Washington BOCES
- Jefferson-Lewis BOCES
- St. Lawrence BOCES
- Jefferson Community College
- North Country Community College
- Paul Smiths College
- St. Lawrence University
- SUNY Plattsburgh
- SUNY Potsdam
- SUNY College of Technology at Canton
- IBEW

Tactic: Connect students with employers to allow for earn and learn opportunity while getting CDL trained.

STRATEGY 7.3

Expand earn and learn and dual credit programs.

Tactic: Coordinate with school districts and community colleges to help establish curriculum that would allow students to earn college credit while in high school.

STRATEGY 7.4

Upskill current employees in positions with high automation potential.

Tactic: Establish and promote clear pathway for employees to increase their skill in a simple, effective, and affordable way.

Tactic: Create a virtual training program for employees in occupations vulnerable to automation.

What Businesses Are Saying:

"We need programs that give industry direct access to their future workforce."



3

North Country **Agribusiness Cluster Research and Strategies**

Background Information

Purpose

This workforce strategy for Agribusiness builds off the Regional Workforce Inventory completed by the Regional Council.

What follows are solution-driven approaches for workforce development and a roadmap for how to address the needs of Agribusinesses in the North Country.

Sector Definition

The Agribusiness cluster includes businesses serving the agricultural production and processing industry, including food, beverage, chemical, and agricultural machinery manufacturing. It also includes wholesale trade, transportation and warehousing, and professional, scientific, and technical services related to agriculture.

From REDC 2022 Annual Report

Training and education services are needed for farm operators and agribusiness employees to advance the region's agricultural industry. They include training for meat processing operations; technical assistance programs for value-added food production; effective utilization of technology to expand medium-size dairy herds and increase milk production; and tools and techniques for increasing yields of produce operations.

Why Agribusiness sector?

The Agribusiness cluster is a critical element of the North Country's economy.

Significant Employment

8,110

jobs, 4.6% of the region's employment

Notable Businesses

403

establishments, share of 4.0%

High Growth

650

jobs added 2017–2021

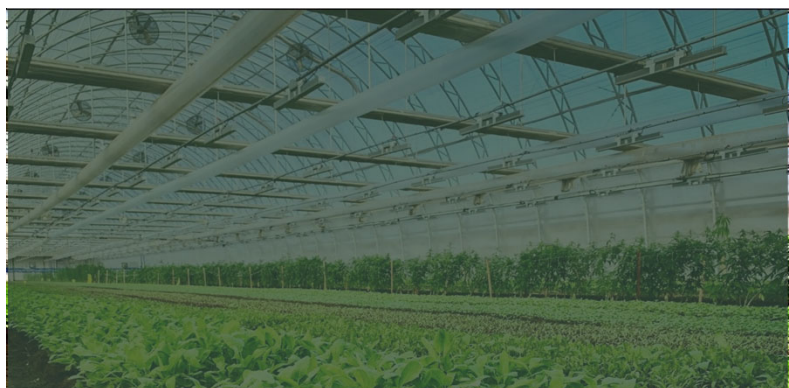
Specialized

3.78

average LQ, highest subsector LQ of 10.7

Cluster Companies in the Region

- Kraft-Heinz
- Great Lakes Cheese
- Agri-Mark
- H.P. Hood
- Agbotic
- Black River Valley



Previous page photo credit: Eric Adsit

What we heard

The team conducted interviews that addressed this sector, including private employers, educators, and workforce development entities. Similar to other employers throughout the North Country, farmers and growers within the Agribusiness cluster are challenged with finding employees to fill their needs. However, agribusiness manufacturers within this cluster described fewer challenges recruiting employees. Two companies noted they had waiting lists for new employees, which they attributed to their organization's presence in the community as well as a variety of internal programs designed to improve the quality of work and offer career opportunities.

Challenges

- Shift work for companies that operate 24/7. Shift schedules can be a barrier where other job opportunities are more attractive for work/life balance.
- Hard to find people who can/want to perform physical labor (heavy lifting, etc.)
- Not enough awareness about the industry

Needs

- Maintenance and mechanic workers (electricians, machinists, welders, etc.)
- Industry specific knowledge and skills (such as Dairy Manufacturing)



What Businesses Are Saying

"Having the labor available to fill roles is the number one need--particularly people who can handle physical labor. Those jobs are the hardest to fill. Automation may have to be an alternative".

What we discovered

The majority of the cluster's jobs are in low-skill occupations

The cluster has 83 occupations with at least 10 jobs.

Occupational Mix:

- 26% Management occupations
- 20% Farming, Fishing, and Forestry occupations
- 11% Production occupations
- 43% Other occupations

Low-Skill Occupations:

- 85% of the jobs in this cluster
- Wages range from \$13.56–\$34.50
- 53% of jobs have above-average risk of automation

Middle-Skill Occupations:

- 8% of the jobs in this cluster
- Wages range from \$19.65–\$27.37
- 71% of jobs have above-average risk of automation

High-Skill Jobs:

- 7% of the jobs in this cluster
- Wages range from \$20.15–\$75.91
- 0% of jobs have above-average risk of automation

Shortage of in-demand skills, particularly for common (or soft) skills

There are 64 skills categories where employer demand exceeds worker supply, based on online job postings and worker profiles.

Top Skills Gaps:

- *Specialized Skills:* Merchandising, Selling Techniques, Warehousing, Auditing, Food Services
- *Qualifications:* CDL, OSHA, Six Sigma, Master of Business Administration, Professional Engineer
- *Common Skills:* Customer Service, Communications, Sales, Management, Operations

Significant gaps across all occupations, particularly among low skill jobs

Projected workforce gap (2022–2032): **(11,329)**

$$\left\{ \begin{array}{l} \text{Openings} - \text{Change in Labor Force} = \text{Workforce Gap} \\ 10,518 - (811) = (11,329) \end{array} \right\}$$

Gaps projected across all 83 occupations in the cluster; gaps are particularly concentrated for Farmers, Ranchers, and Other Agricultural Managers (19.8% of the gap), Farmworkers and Laborers, Crop, Nursery, and Greenhouse (13.7%), and Farmworkers, Farm, Ranch, and Aquacultural Animals (7.1%)

Of the projected workforce gap:

- 88% are Low Skill
- 7% are Middle Skill
- 5% are High Skill

The 13 Top Gap Occupations are plotted on the next page. None of the Top Gap Occupations are considered high skill.

There are training programs for Top Gap Occupations that require formal training.

Truck Drivers and Veterinary Technicians require beyond a high school diploma (or equivalent) for entry.

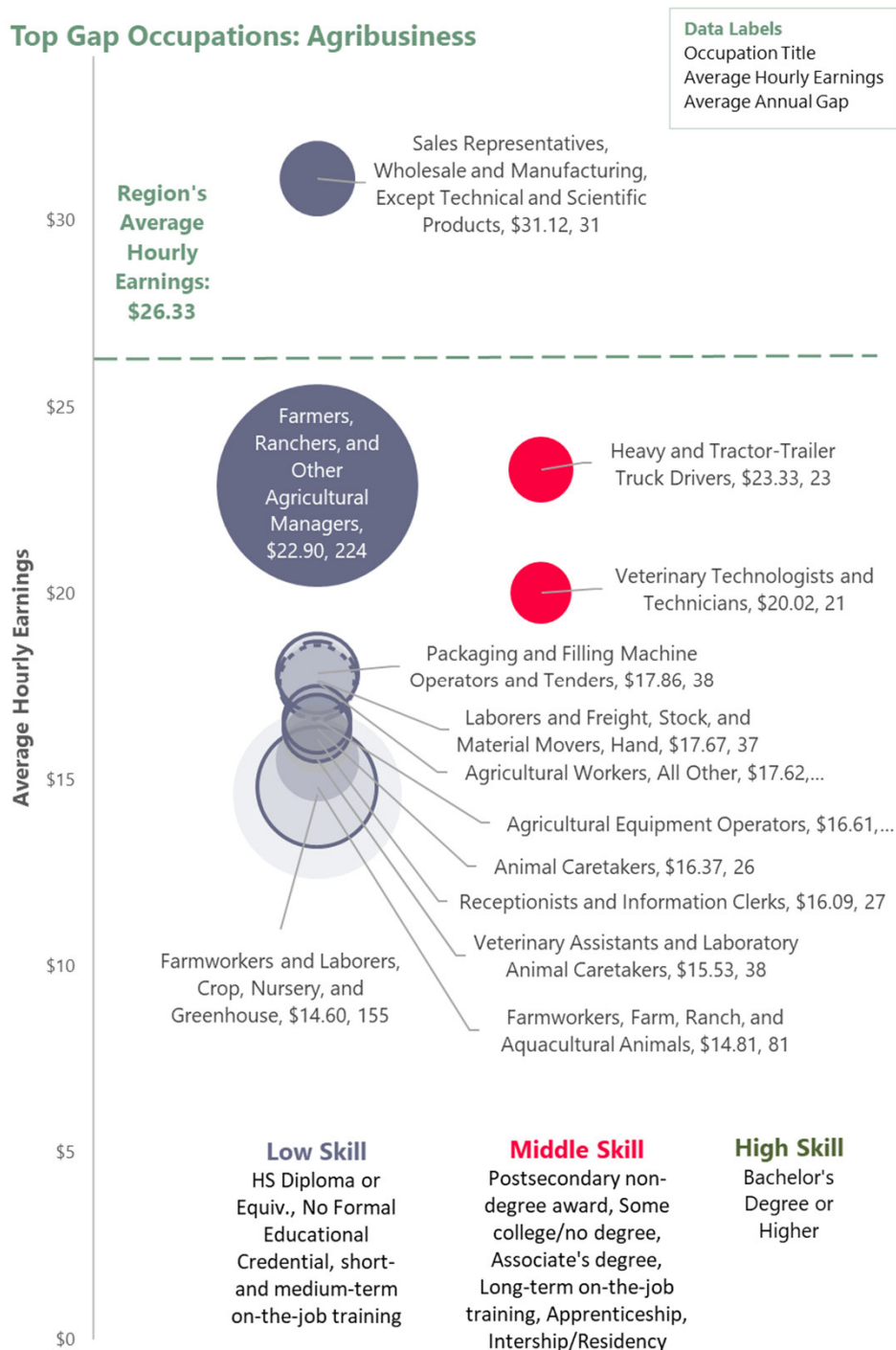
Types of Programs:

- *Higher Education:* 49 active training programs related to – but not required for entry into – the Top Gap Occupations producing an average of 437 graduates who are likely to remain in region (however, this cluster will be competing with all other industries for these workers)
- *Apprenticeships:* 1 for CDL (unknown completions)
- *Certifications:* 3 (2 for CDL, 1 for Vet. Tech.; unknown completions)
- *Other Programs:* 3 (2 for CDL, 1 for Vet. Tech.; unknown completions)

More information needed regarding employer need and capacity for training programs for low- and middle-skill occupations

What we discovered

The occupations with the largest gaps are plotted below by **Skill Level** (x axis, coded by color), **Earnings** (y axis), and **Projected Average Annual Workforce Gap** (bubble size), with average hourly earnings and the gap included in the data labels. These 13 occupations account for 67.1% of the total gaps anticipated in this cluster. None of the Top Gap Occupations are considered High Skill. See appendix for more detail on the Top Gap Occupations.



Agribusiness Findings

The following two themes are specific to the Agribusiness cluster and the critical issues businesses are facing. Nationally, and in the North Country, the Agribusiness cluster is going through a transition that is making it increasingly difficult to attract and retain workers to serve and lead the industry. Continued consolidation, increasingly technical skills needed, shift towards value-added production, and aging of the workforce has put a strain on the workforce pipeline. These themes are addressed in the following initiatives and strategies.

Management capacity and training opportunities

Modern farming and production operations need stronger management and technical skills. Data projects a demand for nearly 225 more Managers each year for the next 10 years. Continuing to expand leadership and management training will benefit the Agribusiness cluster.

Cluster perception and labor costs

The Agribusiness cluster has been challenged by being able to attract workers due to real and perceived challenging work environments, low pay, and the appearance of limited career growth opportunities.

Implementation Plan: Agribusiness Strategies

The Agribusiness cluster implementation strategy recommends a series of projects and initiatives to develop the pipeline of workers. Details and tactics for each of the initiatives are provided in the following pages.

These recommendations align with the needs and opportunities identified throughout the planning process as well as the stakeholder feedback.

#	Initiative	Description	Partners
8	Improve awareness of Agribusiness careers	Strategies to increase awareness of careers within the Agribusiness cluster to expand the potential applicant pool.	Department of Education, K-12 Educators, BOCES, Parents, Employers, Workforce Development Boards, National Associations, Cornell Cooperative Extension
9	Expand Agribusiness Career training programs	Strategies to increase access and availability of Agribusiness cluster related training opportunities to ensure the workforce has the skills needed to succeed.	Higher Education Institutions, Department of Education, K-12 Educators, BOCES, Parents, Employers, United States Department of Agriculture, Workforce Development Boards, Cornell Cooperative Extension

Improve Awareness of Agribusiness Career Path

INITIATIVE 8

Increasing students and existing residents' awareness of the opportunities that exist within the Agribusiness cluster will help to fill the projected occupation gap.

STRATEGY 8.1

Build awareness of local Agribusiness cluster career opportunities.

Tactic: Host events for students and parents to highlight and celebrate individuals who have had success in Agribusiness in the North Country.

Tactic: Create field trips, mentorship, internship, and apprenticeship programs that are coordinated through the school district to raise awareness of the range of opportunities and career pathways.

Tactic: Expand and promote BOCES programs that connect students with Agribusiness cluster opportunities.

Tactic: Use Future Farmers of America and other regional associations' content and materials to support Agribusiness awareness in the classroom.

Top industries in the Agribusiness cluster include:

- Animal Production
- Veterinary Services
- Crop Production
- Cheese Manufacturing
- Beer and Ale Merchant Wholesalers

STRATEGY 8.2

Expand celebration of Agribusiness in the North Country.

Tactic: Work with national industry associations to build on the agriculture celebrations to include value added processors, small and medium sized businesses, and other industries.

- March is Agriculture Month
- June is Dairy Month.

Tactic: Host events throughout the region to include all aspects of Agribusiness from farming to food manufacturing.

Tactic: Coordinate events with job fairs, facility tours, and meet and greets for students and their parents with different community college programs, employers, entrepreneurs, and others.

Example: Resources available [National Ag Day](#)

Many occupations within the Agribusiness cluster do not require more than a high school degree, but on-the-job training is critical to advancement.

Expand Agribusiness Career Training Programs

INITIATIVE 9

The Agribusiness cluster is facing a shortage of a wide variety of occupations, including agricultural managers, veterinary assistants, laborers, and truck drivers. Expanding training programs will ensure pathways exist to train for these critical occupations.

STRATEGY 9.1

Develop and expand apprenticeship programs for top gap occupations.

Tactic: Expand apprenticeship programs for Farmworkers and Laborer's, Animal Caretakers, Agricultural Equipment Operator. These types of programs exist in other states and can be used as examples to replicate.

Tactic: Consider pre-apprenticeship programs, coordination with high schools for summer programs, and other avenues to increase the pipeline of participants.

Tactic: Fund additional mentors to be able to increase apprenticeship opportunities.

Tactic: Expand CDL training programs to address critical need for certified drivers to serve the Agribusiness cluster.

Regional Educational Partners Training Top Gap Occupations:

- Clarkson University
- Clinton Community College
- Clinton Essex Warren Washington BOCES
- Jefferson Community College
- North Country Community College
- Paul Smiths College
- St. Lawrence University
- SUNY Plattsburgh
- SUNY Potsdam
- SUNY College of Technology at Canton

STRATEGY 9.2

Build management capacity to serve Agribusiness cluster throughout the North Country.

Tactic: Establish curriculum to address the skills needs of manager occupations within the Agribusiness cluster and develop and deliver training.

Tactic: Explore cross-institutional partnerships within SUNY to leverage strength of component institutions.

Tactic: Create internships that connect regional business administration students with Agribusiness opportunities.

Tactic: Look to urban centers to establish smaller programs for students or young adults who may be interested in an urban farm opportunities. Connect with business and management skills to develop capacity.

STRATEGY 9.3

Explore potential automation and upskilling opportunities.

Tactic: Support farms and production facilities in reviewing their operations to identify areas for automation and corresponding upskilling of employees.

4

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North Country **Renewable Energy Cluster** **Research and Strategies**

Background Information

Purpose

This workforce strategy for the Renewable Energy sector builds off the Regional Workforce Inventory completed by the Regional Council.

What follows are solution-driven approaches for workforce development and a roadmap for how to address the needs of Renewable Energy businesses in the North Country.

From REDC 2022 Annual Report

Renewable Energy represents another opportunity for regional economic growth while helping the State meet its renewable energy goals under the Climate Leadership and Community Protection Act. The North Country is already host to significant energy generation via hydro, wind and solar. Solar developer interest in the region is especially growing due to available land, state incentives, and other factors. The region has two efforts underway with NYSERDA's "Build Ready" program to attract renewable energy projects that add to the local tax base while creating employment opportunities in the renewable energy sector.

Renewable energy development in the North Country has helped to increase the region's tax base and supported a significant number of good paying construction jobs, while helping to meet the State's renewable energy goals. From a workforce perspective, if we could train more people in electrical work and the related construction trades, there is enough demand to employ even more workers.

Why Renewable Energy?

The Renewable Energy cluster is a critical element of the North Country's economy.

Significant Employment 2,790 jobs, 1.6% of the region's employment	Notable Businesses 217 establishments, share of 2.2%
Stable 13 jobs added 2017–2021	Specialized 2.67 average LQ, highest subsector LQ of 17.96

Sector Definition

The Renewable Energy cluster includes businesses involved in the R&D, generation, storage, and transmission of energy derived from renewable, zero-emission sources (biomass, geothermal, hydropower, solar, and wind). It also includes businesses that manufacture and install the parts and components required for capturing and transforming energy.

What we heard

The Renewable Energy cluster is facing many of the same challenges as the Manufacturing cluster and other regional issues. Unique challenges and needs facing the Renewable Energy cluster include:

Challenges

- High competition for electricians and other skilled trades
- State required ratios for apprenticeship programs is impacting ability to train quickly enough.
- Difficult to offer remote/flexible opportunities because of the nature of the work, many jobs are on-site

Needs

- GED or high school diploma
- Aptitude for technical work
- Electrical engineers & high voltage engineers
- Electricians
- Quality assurance engineers
- Certified mechanics
- Technicians



What Businesses Are Saying:

"We think the North Country as a bit of a Secret Weapon: our company attracts folks that care about the outdoors and environmental sustainability."

What we discovered

The majority of the cluster's jobs are in low skill occupations

The cluster has 63 occupations with at least 10 jobs.

Occupational Mix:

- 26% Construction and Extraction occupations
- 17% Production occupations
- 16% Installation, Maintenance, and Repair occupations
- 41% Other occupations

Low-Skill Occupations:

- 42% of the jobs in this cluster
- Wages range from \$15.32–\$37.77
- 72% of jobs have above-average risk of automation

Middle-Skill Occupations:

- 34% of the jobs in this cluster
- Wages range from \$20.75–\$47.57
- 93% of jobs have above-average risk of automation

High-Skill Jobs:

- 24% of the jobs in this cluster
- Wages range from \$31.22–\$71.86
- 0% of jobs have above-average risk of automation

Shortage of in-demand skills, particularly for common (or soft) skills

There are 60 skills categories where employer demand exceeds worker supply, based on online job postings and worker profiles.

Top Skills Gaps:

- *Specialized Skills:* Merchandising, Construction, Carpentry, Auditing, Finance
- *Qualifications:* CDL, OSHA, Professional Engineer, Security Clearance, Master of Business Administration
- *Common Skills:* Communications, Operations, Management, Problem Solving, Customer Service

Significant gaps across all occupations, particularly among low skill jobs

Projected workforce gap (2022–2032): **(6,144)**

$$\left\{ \begin{array}{l} \text{Openings} - \text{Change in Labor Force} = \text{Workforce Gap} \\ 5,619 - (525) = (6,144) \end{array} \right\}$$

Gaps projected across all 63 occupations in the cluster; gaps are particularly concentrated for Electricians (22.4% of the gap), Electrical, Electronic, and Electromechanical Assemblers (10.8%), and Construction Laborers (5.5%)

Of the projected workforce gap:

- 45% are Low Skill
- 38% are Middle Skill
- 17% are High Skill

The 14 Top Gap Occupations are plotted on the next page

There are training programs available for the Top Gap Occupations that require formal training, but few do

Only 2 of the 14 Top Gap Occupations require beyond a high school diploma (or equivalent) for entry.

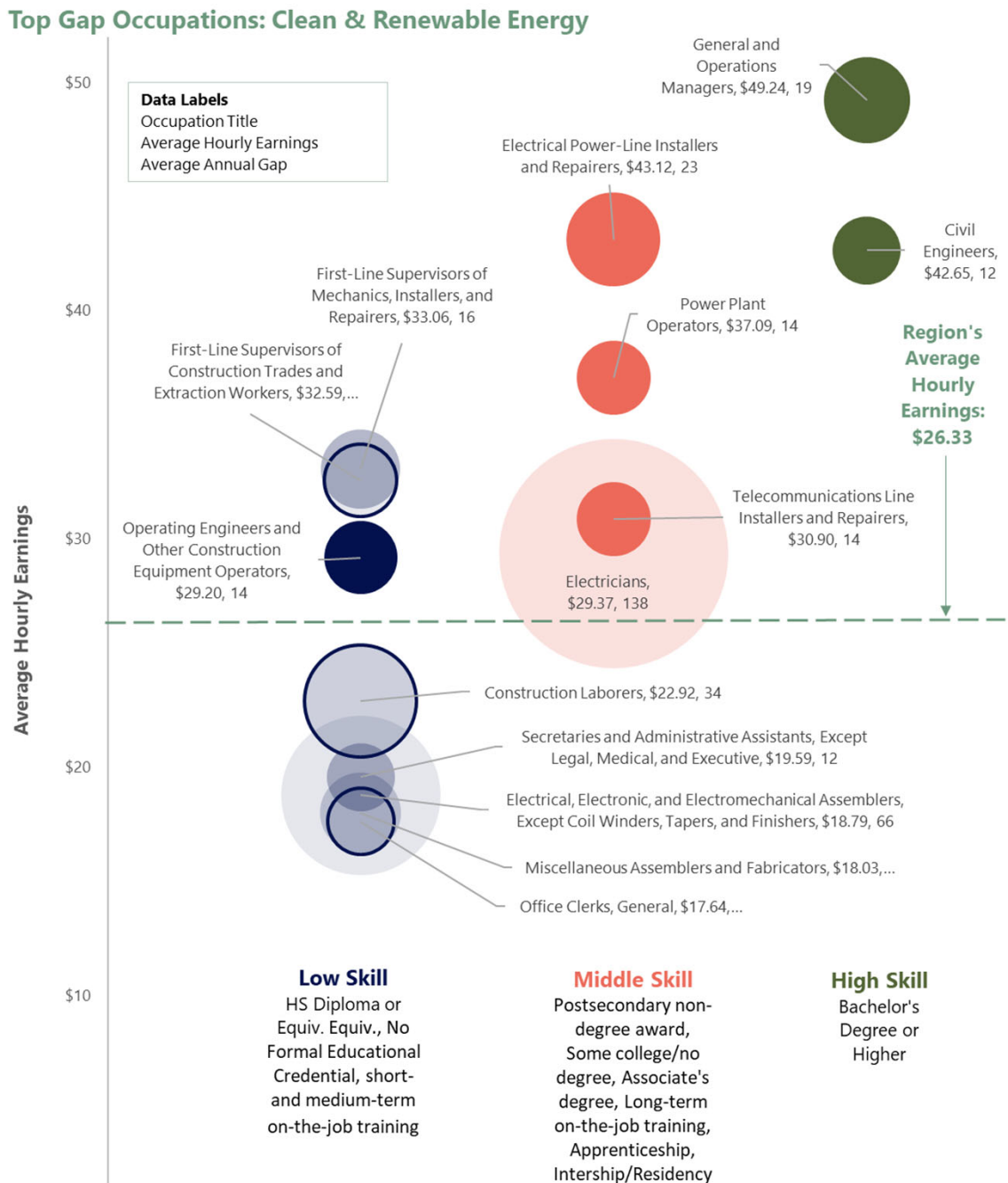
Types of Programs:

- *Higher Education:* 137 active training programs related to the Top Gap Occupations (whether they require it or not) producing an average of 1,311 graduates who are likely to remain in region (however, this cluster will be competing with all other industries for these workers)
- *Apprenticeships:* 12 (8 for Electricians, 4 for Electrical Power-Line Installers and Repairers; unknown completions)
- *Certifications:* 1 for Electrical Power-Line Installers and Repairers (unknown completions)
- *Other Programs:* 2 (1 for Operating Engineers, 1 for Electrical Power-Line Installers and Repairers; unknown completions)

More information needed regarding employer need and capacity for training programs for low- and middle-skill occupations

What we discovered

The occupations with the largest gaps are plotted by: **Skill Level** (x axis, industries are coded by skill color), **Earnings** (y axis), and **Projected Average Annual Workforce Gap** (bubble size), with average hourly earnings and the gap included in the data labels. These 14 occupations account for 66.2% of the total gaps anticipated in this cluster.



Renewable Energy Findings

The following two themes are specific to the Renewable Energy cluster and the critical issues businesses are facing. The North Country does not currently have enough electricians to fill the need associated with the Renewable Energy sector, along with other occupations ranging from laborers to managers. These themes are addressed in the following initiatives and strategies.

Need for Electricians

Data suggests that the Renewable Energy cluster is in significant need of Electricians, and similar occupations, to fill critical positions. With an average gap of 138 positions per year, Electricians are by far the occupation in need of the largest number of individuals to meet the sector's growth.

Additional formal training, on the job, and apprenticeship programs are needed to expand the pathway and address needs of the Renewable Energy cluster.

Emerging cluster has strong potential in the North Country

As a growing industry, the Renewable Energy cluster requires a wide variety of occupations, allowing for career growth for all education levels. Alignment with many individuals' values, the Renewable Energy cluster poses an opportunity for the North Country and will require a continued awareness campaign to grow the pipeline of qualified applicants.

Implementation Plan: Renewable Energy Strategies

The Renewable Energy cluster implementation strategy recommends a series of projects and initiatives to develop the pipeline of workers. Details and tactics for each of the initiatives are provided in the following pages.

These recommendations align with the needs and opportunities identified throughout the planning process as well as the stakeholder feedback.

#	Initiative	Description	Partners
10	Improve awareness of Renewable Energy careers	Strategies to increase awareness of careers within the Renewable Energy cluster to expand the potential applicant pool.	Department of Education, K-12 Educators, BOCES, Parents, Employers, Workforce Development Boards, National Associations
11	Expand Renewable Energy training programs	Strategies to increase access and availability of Renewable Energy cluster related training opportunities to ensure the workforce has the skills needed to succeed.	Higher Education Institutions, Department of Education, K-12 Educators, BOCES, Parents, Employers, Workforce Development Boards

Expand Awareness of Renewable Energy Career

STRATEGY 10

Renewable Energy is an emerging cluster with a wide range of career pathways for students to consider. Expanding the awareness of the various opportunities will enhance the workforce pipeline for the sector.

STRATEGY 10.1

Connect the sector with those looking for a purpose driven career path.

Tactic: Work with local companies to create marketing materials, social media presence, and messaging around how the industry makes a difference.

Tactic: Use social media (TikTok specifically) to promote message to a younger audience who may not relate to typical avenues and channels for career development. Highlight the career growth potential and variety of occupations needed to serve the sector and make a difference in the North Country.

STRATEGY 10.2

Expand presence in high schools to connect students with opportunities.

Tactic: Establish high school clubs and curriculum opportunities tied to renewable energy opportunities.

Example: Recharge Academy – Wind Win RI

STRATEGY 10.3

Coordination between education and industry.

Tactic: Facilitate a roundtable to discuss changing sector demands and skills needs that can be incorporated into middle school, high school, community college, and beyond.

Tactic: Expand capacity within regional BOCES programs to address growing and changing needs of the sector and connect students with industry opportunities.

Tactic: Invite for renewable energy companies to sponsor events and clubs to raise awareness among variety of students.

What Businesses Are Saying:

"The pipeline is not a challenge in terms of raw numbers, but it is in terms of specific talents that we need. We are not in a position to make 'sub optimal' hires, so we are very thoughtful about recruitment."

Grow Offering of Renewable Energy Career Training

STRATEGY 11

As a sector, the Renewable Energy cluster is changing rapidly and the demand for skilled workers is growing. Having the latest training offerings will ensure that the North Country's Renewable Energy cluster is able to continue to innovate and change with the times.

STRATEGY 11.1

Coordinate with Fort Drum to establish a military to certification fast track program.

Tactic: Identify the skills/experience most relevant to the renewable energy sector and create a pathway to certification that accounts for military experience and training.

Tactic: Create opportunities for employers to reach out to those being discharged to identify opportunities to transition into private sector employment.

STRATEGY 11.2

Expand apprenticeship programs for electricians and other critical trades.

Tactic: Create an inventory of current programs and capacity that can be accessed by students and service providers.

Tactic: Fund additional apprenticeship programs, including funding for more mentors.

Tactic: Consider a temporary adjustment to apprenticeship ratio requirements to expand the training capacity.

STRATEGY 11.3

Offer additional CDL training.

Tactic: Coordinate with current employers about needs and understand where and when the programs are most effective.

Tactic: Connect potential students with employers to allow for earn and learn opportunity while getting CDL trained.

Apprenticeship partners:

- Dow Electric
- Electricians JAC – Watertown LU #910
- Public Works Utilities
- Canton Potsdam Hospital
- Knowlton Technologies, LLC
- OX Specialty Paper, LLC
- PACTIV LLC
- Potsdam Specialty Paper, Inc.
- Town of Massena Electrical Department
- Village of Philadelphia, Inc.
- Village of Theresa

Source: U.S. Department of Labor, Employment, and Training Administration

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Appendix

Appendix Manufacturing

Top Gap Occupations

	Miscellaneous Assemblers and Fabricators 51-2098	Laborers and Freight, Stock, and Material Movers, Hand 53-7062	First-Line Supervisors of Production and Operating Workers 51-1011	Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers 51-2028	Paper Goods Machine Setters, Operators, and Tenders 51-9196	Inspectors, Testers, Sorters, Samplers, and Weighers 51-9061	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic 51-4072	Maintenance and Repair Workers, General 49-9071
Cluster Jobs	853	290	367	292	318	244	245	212
Share of Staffing Pattern	11.2%	3.8%	4.8%	3.8%	4.2%	3.2%	3.2%	2.8%
2021 Net Commuters	-75	-142	-64	-36	14	-45	1	-117
Change in Resident Workers (2016–2021)	-14%	18%	0%	86%	-24%	5%	15%	20%
2021 Turnover Rate	76%	95%	42%	55%	46%	66%	57%	53%
Automation Index (1)	113	117	89	111	120	106	117	110
Earnings								
Avg. Hourly Earnings	\$18.03	\$17.67	\$30.91	\$18.79	\$24.80	\$21.85	\$16.02	\$21.09
Wage Difference from Self Sufficiency (2)								
1 adult	\$6.73	\$6.38	\$19.61	\$7.49	\$13.50	\$10.55	\$4.72	\$9.79
1 adult + 1 school-aged child	(\$0.13)	(\$0.48)	\$12.75	\$0.63	\$6.64	\$3.69	(\$2.14)	\$2.93
Workforce Gap Analysis (2022–2032)								
Openings (3)	885	394	370	336	300	267	253	204
Labor Force Change (4)	(76)	(27)	(35)	(28)	(26)	(21)	(24)	(19)
Occupational Gap (5)	(962)	(421)	(405)	(364)	(325)	(289)	(277)	(223)
Average Annual Gap	(96)	(42)	(41)	(36)	(33)	(29)	(28)	(22)
Share of Total Gap	11.0%	4.8%	4.6%	4.2%	3.7%	3.3%	3.2%	2.5%
Job Requirements								
Typical entry-level education	HS diploma or equiv.	No formal credential	HS diploma or equiv.	HS diploma or equiv.	HS diploma or equiv.	HS diploma or equiv.	HS diploma or equiv.	HS diploma or equiv.
Typical Work Experience	None	None	< 5 years	None	None	None	None	None
Typical on-the-job training	Moderate	Short	None	Moderate	Moderate	Moderate	Moderate	Moderate
Training Pipeline								
Higher Education Training Programs	0	0	4	2	0	2	0	8
Avg. Annual Completions (2010–2020) (6)	0	0	75	13	0	9	0	17
Apprenticeship Programs (7)	.	.	.	.	.	.	.	.
Other Training Programs (8)	.	.	.	.	.	.	.	.
Certification Offered	.	.	.	.	.	.	.	.
Demographics								
Age < 25	12%	24%	2%	12%	0%	9%	9%	7%
Age 55 +	22%	17%	26%	24%	28%	27%	19%	31%
Females	35%	17%	19%	43%	20%	37%	17%	4%
Diversity	11%	15%	10%	13%	6%	13%	7%	20%

Top Gap Occupations

	Industrial Machinery Mechanics 49-9041	Welders, Cutters, Solderers, and Brazers 51-4121	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products 41-4012	General and Operations Managers 11-1021	Production, Planning, and Expediting Clerks 43-5061	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic 51-4031	Packaging and Filling Machine Operators and Tenders 51-9111
Cluster Jobs	181	143	152	166	162	157	166
Share of Staffing Pattern	2.4%	1.9%	2.0%	2.2%	2.1%	2.0%	2.2%
2021 Net Commuters	-19	-7	-85	-299	-76	4	-18
Change in Resident Workers (2016–2021)	-6%	-10%	-14%	30%	47%	130%	-9%
2021 Turnover Rate	36%	42%	36%	45%	49%	38%	61%
Automation Index (1)	110	121	92	82	94	116	117
Earnings							
Avg. Hourly Earnings	\$27.37	\$23.53	\$31.12	\$49.24	\$22.82	\$18.39	\$17.86
Wage Difference from Self Sufficiency (2)							
1 adult	\$16.07	\$12.23	\$19.83	\$37.94	\$11.53	\$7.10	\$6.57
1 adult + 1 school-aged child	\$9.21	\$5.38	\$12.97	\$31.08	\$4.67	\$0.24	(\$0.29)
Workforce Gap Analysis (2022–2032)							
Openings (3)	181	180	163	155	156	156	157
Labor Force Change (4)	(18)	(15)	(15)	(16)	(15)	(14)	(13)
Occupational Gap (5)	(199)	(195)	(178)	(171)	(170)	(170)	(170)
Average Annual Gap	(20)	(19)	(18)	(17)	(17)	(17)	(17)
Share of Total Gap	2.3%	2.2%	2.0%	2.0%	1.9%	1.9%	1.9%
Job Requirements							
Typical entry-level education	HS diploma or equiv.	HS diploma or equiv.	HS diploma or equiv.	Bachelor's degree	HS diploma or equiv.	HS diploma or equiv.	HS diploma or equiv.
Typical Work Experience	None	None	None	5 years +	None	None	None
Typical on-the-job training	Long	Moderate	Moderate	None	Moderate	Moderate	Moderate
Training Pipeline							
Higher Education Training Programs	2	1	32	59	1	0	0
Avg. Annual Completions (2010–2020) (6)	9	1	561	805	1	0	0
Apprenticeship Programs (7)	.	.	.	.	.	.	.
Other Training Programs (8)	.	1	.	.	.	.	.
Certification Offered	.	1	.	.	.	.	.
Demographics							
Age < 25	3%	7%	2%	2%	7%	0%	12%
Age 55 +	29%	18%	34%	26%	25%	22%	22%
Females	3%	4%	23%	31%	54%	13%	54%
Diversity	9%	13%	4%	8%	12%	.	19%

Top Gap Occupations

	Heavy and Tractor- Trailer Truck Drivers 53-3032	Helpers--Production Workers 51-9198	Machinists 51-4041	Semiconductor Processing Technicians 51-9141	Production Workers, All Other 51-9199	Shipping, Receiving, and Inventory Clerks 43-5071	Engine and Other Machine Assemblers 51-2031
Cluster Jobs	125	94	98	79	99	111	97
Share of Staffing Pattern	1.6%	1.2%	1.3%	1.0%	1.3%	1.5%	1.3%
2021 Net Commuters	-180	0	-21	10	8	-70	13
Change in Resident Workers (2016–2021)	-7%	-52%	-28%	Insf. Data	35%	-5%	107%
2021 Turnover Rate	51%	91%	48%	62%	81%	55%	80%
Automation Index (1)	110	120	115	108	125	109	119
Earnings							
Avg. Hourly Earnings	\$23.33	\$18.08	\$22.43	\$17.77	\$17.71	\$18.30	\$26.28
Wage Difference from Self Sufficiency (2)							
1 adult	\$12.03	\$6.78	\$11.13	\$6.48	\$6.42	\$7.00	\$14.99
1 adult + 1 school-aged child	\$5.18	(\$0.07)	\$4.28	(\$0.38)	(\$0.44)	\$0.14	\$8.13
Workforce Gap Analysis (2022–2032)							
Openings (3)	155	127	119	115	114	100	99
Labor Force Change (4)	(13)	(8)	(10)	(9)	(10)	(10)	(9)
Occupational Gap (5)	(168)	(135)	(129)	(124)	(124)	(110)	(107)
Average Annual Gap	(17)	(13)	(13)	(12)	(12)	(11)	(11)
Share of Total Gap	1.9%	1.5%	1.5%	1.4%	1.4%	1.3%	1.2%
Job Requirements							
Typical entry-level education	Nondegree award	HS diploma or equiv.	HS diploma or equiv.	HS diploma or equiv.	HS diploma or equiv.	HS diploma or equiv.	HS diploma or equiv.
Typical Work Experience	None	None	None	None	None	None	None
Typical on-the-job training	Short	Short	Long	Moderate	Moderate	Short	Moderate
Training Pipeline							
Higher Education Training Programs	0	0	0	0	0	2	0
Avg. Annual Completions (2010–2020) (6)	0	0	0	0	0	2	0
Apprenticeship Programs (7)	1	.	2	.	.	.	.
Other Training Programs (8)	2	.	1	.	.	.	.
Certification Offered	2	.	1	.	.	.	.
Demographics							
Age < 25	5%	9%	0%	0%	12%	12%	0%
Age 55 +	33%	18%	23%	18%	23%	22%	20%
Females	5%	21%	4%	36%	27%	30%	23%
Diversity	11%	14%	12%	.	14%	16%	.

Notes

Unless otherwise noted, all data is for 2021 and was sourced from Lightcast (formerly EMSI / Burning Glass).

- 1) **Automation Index:** The occupation's risk of being affected by automation. The scale is base is 100, with indices greater than 100 indicating higher-than-average risk of automation.
- 2) **Wage Difference from Self-Sufficiency:** Measures the income families of various sizes need to pay for basic expenses. For the North Country, the Self-Sufficiency Standard is \$11.30/hour for 1 adult and \$18.15/hour for 1 adult + 1 school-aged child. Source: The Self-Sufficiency Standard for New York 2021, Center for Women's Welfare, University of Washington School of Social Work, March 2021.
- 3) **Openings** = Projected new jobs + replacement jobs (jobs that will need to be filled by new hires due to existing workers leaving the occupation because of retirements or a worker otherwise exiting the occupation). Camoin estimated the cluster's Openings by multiplying the total openings for the occupation across the entire economy by the average of the cluster's 2022 and 2032 shares of total employment for that occupation. Source: Camoin + Lightcast.
- 4) **Labor Force Change:** Camoin modeled the projected Labor Force Change using population projections by age group for the Region, New York State's historical labor force participation rates, and national trends in participation by age group to capture changes due to the aging of the workforce. Labor Force Change = (Total 2022–2032 change in labor force) x (average of occupation's 2022 and 2032 shares of total employment) x (average of cluster's 2022 and 2032 shares of total employment for that occupation). Sources: Camoin, Bureau of Labor Statistics, and Lightcast.
- 5) **Occupational Gap** = Labor Force Change – Openings
- 6) **Average Annual Completions:** Assumes the Northeast's graduate retention rate of 71%. Source: National Center for Education Statistics.
- 7) **Apprenticeship Programs:** Source: US Department of Labor's National Registered Apprenticeship System
- 8) **Other Training Programs:** Source: New York State Eligible Training Providers List

Appendix Agribusiness

Top Gap Occupations

	Farmers, Ranchers, and Other Agricultural Managers 11-9013	Farmworkers and Laborers, Crop, Nursery, and Greenhouse 45-2092	Farmworkers, Farm, Ranch, and Aquacultural Animals 45-2093	Veterinary Assistants and Laboratory Animal Caretakers 31-9096	Packaging and Filling Machine Operators and Tenders 51-9111	Laborers and Freight, Stock, and Material Movers, Hand 53-7062	Agricultural Workers, All Other 45-2099
Cluster Jobs	1,930	855	429	166	291	235	175
Share of Staffing Pattern	24.3%	10.8%	5.4%	2.1%	3.7%	3.0%	2.2%
2021 Net Commuters	-61	-131	-28	43	-18	-142	-11
Change in Resident Workers (2016–2021)	20%	-12%	4%	132%	-9%	18%	22%
2021 Turnover Rate	18%	106%	75%	57%	61%	95%	84%
Automation Index (1)	94	113	107	94	117	117	108
Earnings							
Avg. Hourly Earnings	\$22.90	\$14.60	\$14.81	\$15.53	\$17.86	\$17.67	\$17.62
Wage Difference from Self Sufficiency (2)							
1 adult	\$11.61	\$3.31	\$3.51	\$4.24	\$6.57	\$6.38	\$6.33
1 adult + 1 school-aged child	\$4.75	(\$3.55)	(\$3.35)	(\$2.62)	(\$0.29)	(\$0.48)	(\$0.53)
Workforce Gap Analysis (2022–2032)							
Openings (3)	2,051	1,470	764	361	348	341	301
Labor Force Change (4)	(193)	(85)	(44)	(19)	(30)	(24)	(17)
Occupational Gap (5)	(2,244)	(1,555)	(808)	(380)	(378)	(365)	(319)
Average Annual Gap	(224)	(155)	(81)	(38)	(38)	(37)	(32)
Share of Total Gap	19.8%	13.7%	7.1%	3.4%	3.3%	3.2%	2.8%
Job Requirements							
Typical entry-level education	HS diploma or equiv.	No formal credential	No formal credential	HS diploma or equiv.	HS diploma or equiv.	No formal credential	No formal credential
Typical Work Experience	5 years or more	None	None	None	None	None	None
Typical on-the-job training	None	Short	Short	Short	Moderate	Short	Short
Training Pipeline							
Higher Education Training Programs	3	0	2	2	0	0	0
Avg. Annual Completions (2010–2020) (6)	11	0	10	42	0	0	0
Apprenticeship Programs (7)	.	.	.	.	.	.	.
Other Training Programs (8)	.	.	.	1	.	.	.
Certification Offered	.	.	.	1	.	.	.
Demographics							
Age < 25	6%	23%	25%	23%	12%	24%	26%
Age 55 +	44%	20%	20%	7%	22%	17%	20%
Females	18%	26%	27%	78%	54%	17%	26%
Diversity	10%	26%	27%	17%	19%	15%	25%

Top Gap Occupations

	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products 41-4012	Receptionists and Information Clerks 43-4171	Animal Caretakers 39-2021	Agricultural Equipment Operators 45-2091	Heavy and Tractor- Trailer Truck Drivers 53-3032	Veterinary Technologists and Technicians 29-2056
Cluster Jobs	1,930	855	429	166	291	235
Share of Staffing Pattern	24.3%	10.8%	5.4%	2.1%	3.7%	3.0%
2021 Net Commuters	-61	-131	-28	43	-18	-142
Change in Resident Workers (2016–2021)	20%	-12%	4%	132%	-9%	18%
2021 Turnover Rate	18%	106%	75%	57%	61%	95%
Automation Index (1)	94	113	107	94	117	117
Earnings						
Avg. Hourly Earnings	\$31.12	\$16.09	\$16.37	\$16.61	\$23.33	\$20.02
Wage Difference from Self Sufficiency (2)						
1 adult	\$19.83	\$4.80	\$5.08	\$5.31	\$12.03	\$8.73
1 adult + 1 school-aged child	\$12.97	(\$2.06)	(\$1.78)	(\$1.55)	\$5.18	\$1.87
Workforce Gap Analysis (2022–2032)						
Openings (3)	287	248	249	249	217	191
Labor Force Change (4)	(26)	(18)	(14)	(14)	(18)	(19)
Occupational Gap (5)	(313)	(267)	(263)	(263)	(235)	(210)
Average Annual Gap	(31)	(27)	(26)	(26)	(23)	(21)
Share of Total Gap	2.8%	2.4%	2.3%	2.3%	2.1%	1.9%
Job Requirements						
Typical entry-level education	HS diploma or equiv.	HS diploma or equiv.	HS diploma or equiv.	No formal credential	Nondegree award	Associate's degree
Typical Work Experience	None	None	None	None	None	None
Typical on-the-job training	Moderate	Short	Short	Moderate	Short	None
Training Pipeline						
Higher Education Training Programs	25	15	0	0	0	2
Avg. Annual Completions (2010–2020) (6)	254	79	0	0	0	42
Apprenticeship Programs (7)	.	.	.	.	1	.
Other Training Programs (8)	.	.	.	.	2	.
Certification Offered	.	.	.	.	2	.
Demographics						
Age < 25	2%	19%	26%	23%	5%	16%
Age 55 +	34%	26%	11%	14%	33%	7%
Females	23%	93%	76%	25%	5%	79%
Diversity	4%	13%	10%	23%	11%	19%

Notes

Unless otherwise noted, all data is for 2021 and was sourced from Lightcast (formerly EMSI / Burning Glass).

- 1) **Automation Index:** The occupation's risk of being affected by automation. The scale is base is 100, with indices greater than 100 indicating higher-than-average risk of automation.
- 2) **Wage Difference from Self-Sufficiency:** Measures the income families of various sizes need to pay for basic expenses. For the North Country, the Self-Sufficiency Standard is \$11.30/hour for 1 adult and \$18.15/hour for 1 adult + 1 school-aged child. Source: The Self-Sufficiency Standard for New York 2021, Center for Women's Welfare, University of Washington School of Social Work, March 2021.
- 3) **Openings** = Projected new jobs + replacement jobs (jobs that will need to be filled by new hires due to existing workers leaving the occupation because of retirements or a worker otherwise exiting the occupation). Camoin estimated the cluster's Openings by multiplying the total openings for the occupation across the entire economy by the average of the cluster's 2022 and 2032 shares of total employment for that occupation. Source: Camoin + Lightcast.
- 4) **Labor Force Change:** Camoin modeled the projected Labor Force Change using population projections by age group for the Region, New York State's historical labor force participation rates, and national trends in participation by age group to capture changes due to the aging of the workforce. Labor Force Change = (Total 2022–2032 change in labor force) x (average of occupation's 2022 and 2032 shares of total employment) x (average of cluster's 2022 and 2032 shares of total employment for that occupation). Sources: Camoin, Bureau of Labor Statistics, and Lightcast.
- 5) **Occupational Gap** = Labor Force Change – Openings
- 6) **Average Annual Completions:** Assumes the Northeast's graduate retention rate of 71%. Source: National Center for Education Statistics.
- 7) **Apprenticeship Programs:** Source: US Department of Labor's National Registered Apprenticeship System
- 8) **Other Training Programs:** Source: New York State Eligible Training Providers List

Appendix Renewable Energy

Top Gap Occupations

	Electricians 47-2111	Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers 51-2028	Construction Laborers 47-2061	Electrical Power-Line Installers and Repairers 49-9051	General and Operations Managers 11-1021	Miscellaneous Assemblers and Fabricators 51-2098	First-Line Supervisors of Mechanics, Installers, and Repairers 49-1011
Cluster Jobs	360	152	128	120	94	50	71
Share of Staffing Pattern	14.9%	6.3%	5.3%	5.0%	3.9%	2.1%	2.9%
2021 Net Commuters	-84	-36	-88	-6	-299	-75	-34
Change in Resident Workers (2016–2021)	-19%	86%	5%	-23%	30%	-14%	10%
2021 Turnover Rate	47%	55%	70%	38%	45%	76%	41%
Automation Index (1)	110	111	132	114	82	113	94
Earnings							
Avg. Hourly Earnings	\$29.37	\$18.79	\$22.92	\$43.12	\$49.24	\$18.03	\$33.06
Wage Difference from Self Sufficiency (2)							
1 adult	\$18.08	\$7.49	\$11.63	\$31.83	\$37.94	\$6.73	\$21.77
1 adult + 1 school-aged child	\$11.22	\$0.63	\$4.77	\$24.97	\$31.08	(\$0.13)	\$14.91
Workforce Gap Analysis (2022–2032)							
Openings (3)	1,262	613	309	209	175	157	148
Labor Force Change (4)	(115)	(51)	(29)	(21)	(18)	(14)	(15)
Occupational Gap (5)	(1,378)	(664)	(337)	(230)	(194)	(171)	(163)
Average Annual Gap	(138)	(66)	(34)	(23)	(19)	(17)	(16)
Share of Total Gap	22.4%	10.8%	5.5%	3.7%	3.2%	2.8%	2.7%
Job Requirements							
Typical entry-level education	HS diploma or equiv.	HS diploma or equiv.	No formal credential	HS diploma or equiv.	Bachelor's degree	HS diploma or equiv.	HS diploma or equiv.
Typical Work Experience	None	None	None	None	5 years +	None	< 5 years
Typical on-the-job training	Apprenticeship	Moderate	Short	Long	None	Moderate	None
Training Pipeline							
Higher Education Training Programs	4	2	2	1	59	0	10
Avg. Annual Completions (2010–2020) (6)	14	13	0	13	805	0	40
Apprenticeship Programs (7)	8	.	.	4	.	.	.
Other Training Programs (8)	.	.	.	1	.	.	.
Certification Offered	.	.	.	1	.	.	.
Demographics							
Age < 25	11%	12%	12%	0%	2%	12%	2%
Age 55 +	20%	24%	19%	16%	26%	22%	30%
Females	3%	43%	3%	2%	31%	35%	6%
Diversity	15%	13%	24%	13%	8%	11%	14%

Top Gap Occupations

	Power Plant Operators 51-8013	Telecommunications Line Installers and Repairers 49-9052	First-Line Supervisors of Construction Trades and Extraction Workers 47-1011	Operating Engineers and Other Construction Equipment Operators 47-2073	Office Clerks, General 43-9061	Civil Engineers 17-2051	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive 43-6014
Cluster Jobs	69	50	66	47	46	50	49
Share of Staffing Pattern	2.9%	2.1%	2.8%	1.9%	1.9%	2.1%	2.0%
2021 Net Commuters	22	-9	-53	-9	-218	-2	-262
Change in Resident Workers (2016–2021)	5%	-21%	-4%	38%	-17%	15%	-14%
2021 Turnover Rate	17%	56%	63%	75%	61%	28%	60%
Automation Index (1)	109	117	106	120	102	82	91
Earnings							
Avg. Hourly Earnings	\$37.09	\$30.90	\$32.59	\$29.20	\$17.64	\$42.65	\$19.59
Wage Difference from Self Sufficiency (2)							
1 adult	\$25.79	\$19.60	\$21.29	\$17.91	\$6.34	\$31.36	\$8.30
1 adult + 1 school-aged child	\$18.93	\$12.74	\$14.43	\$11.05	(\$0.52)	\$24.50	\$1.44
Workforce Gap Analysis (2022–2032)							
Openings (3)	131	132	130	127	112	108	111
Labor Force Change (4)	(13)	(11)	(13)	(11)	(9)	(13)	(10)
Occupational Gap (5)	(144)	(144)	(143)	(138)	(121)	(121)	(121)
Average Annual Gap	(14)	(14)	(14)	(14)	(12)	(12)	(12)
Share of Total Gap	2.3%	2.3%	2.3%	2.3%	2.0%	2.0%	2.0%
Job Requirements							
Typical entry-level education	HS diploma or equiv.	HS diploma or equiv.	HS diploma or equiv.	HS diploma or equiv.	HS diploma or equiv.	Bachelor's degree	HS diploma or equiv.
Typical Work Experience	None	None	5 years +	None	None	None	None
Typical on-the-job training	Long	Long	None	Moderate	Short	None	Short
Training Pipeline							
Higher Education Training Programs	4	4	9	0	11	4	27
Avg. Annual Completions (2010–2020) (6)	4	14	24	0	45	76	262
Apprenticeship Programs (7)	.	.	.	.	.	.	.
Other Training Programs (8)	.	1	.	1	.	.	.
Certification Offered	.	1	.	.	.	.	.
Demographics							
Age < 25	0%	0%	0%	6%	16%	7%	7%
Age 55 +	27%	14%	30%	29%	30%	25%	37%
Females	6%	5%	3%	3%	82%	13%	95%
Diversity	10%	13%	11%	14%	24%	29%	16%

Notes

Unless otherwise noted, all data is for 2021 and was sourced from Lightcast (formerly EMSI / Burning Glass).

- 1) **Automation Index:** The occupation's risk of being affected by automation. The scale is base is 100, with indices greater than 100 indicating higher-than-average risk of automation.
- 2) **Wage Difference from Self-Sufficiency:** Measures the income families of various sizes need to pay for basic expenses. For the North Country, the Self-Sufficiency Standard is \$11.30/hour for 1 adult and \$18.15/hour for 1 adult + 1 school-aged child. Source: The Self-Sufficiency Standard for New York 2021, Center for Women's Welfare, University of Washington School of Social Work, March 2021.
- 3) **Openings** = Projected new jobs + replacement jobs (jobs that will need to be filled by new hires due to existing workers leaving the occupation because of retirements or a worker otherwise exiting the occupation). Camoin estimated the cluster's Openings by multiplying the total openings for the occupation across the entire economy by the average of the cluster's 2022 and 2032 shares of total employment for that occupation. Source: Camoin + Lightcast.
- 4) **Labor Force Change:** Camoin modeled the projected Labor Force Change using population projections by age group for the Region, New York State's historical labor force participation rates, and national trends in participation by age group to capture changes due to the aging of the workforce. Labor Force Change = (Total 2022–2032 change in labor force) x (average of occupation's 2022 and 2032 shares of total employment) x (average of cluster's 2022 and 2032 shares of total employment for that occupation). Sources: Camoin, Bureau of Labor Statistics, and Lightcast.
- 5) **Occupational Gap** = Labor Force Change – Openings
- 6) **Average Annual Completions:** Assumes the Northeast's graduate retention rate of 71%. Source: National Center for Education Statistics.
- 7) **Apprenticeship Programs:** Source: US Department of Labor's National Registered Apprenticeship System
- 8) **Other Training Programs:** Source: New York State Eligible Training Providers List



Prepared by:

