

Acknowledgements

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and to all those employers who contributed to the project through surveys, interviews, and engagement activities. Your input was critical in identifying workforce challenges and informing the strategies outlined in this report.

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Executive Summary

The GO Virginia Region 3 Talent Pathways Initiative (TPI) provides a comprehensive, data-driven assessment of the region's workforce needs and identifies targeted strategies to strengthen talent pipelines aligned to industry demand. The initiative was designed to support regional economic growth by analyzing workforce supply and demand, identifying skills and training gaps, and developing actionable strategies that connect employers with education and workforce partners.

This effort focused on two priority industry clusters— **Advanced Manufacturing & Advanced Materials** and **Controlled Environment Agriculture (CEA)**—selected for their importance to the region's growth and diversification strategy and their alignment with statewide economic priorities.

Key Findings

1. Workforce Demand Remains Strong, Driven by Replacement Needs

Regional workforce demand for living wage jobs exceeds available labor supply, with open positions outpacing the available workforce. Much of this demand is driven by replacement needs due to retirements and workforce turnover, particularly in an aging population.

2. Manufacturing Employment Reflects Dual Talent Gaps

Manufacturing remains a critical sector in Region 3, with consistent demand for production roles as well as skilled trades and technical positions. Employers report difficulty filling both entry-level and advanced technical roles—highlighting a dual challenge of workforce readiness and high-skill talent shortages.

3. Controlled Environment Agriculture Presents High-Potential Growth Opportunity

While currently limited in workforce size, the CEA sector is highly technical and positioned for future expansion. Workforce needs span entry-level to highly specialized roles, requiring a blend of skills across engineering, automation, IT, and agriculture.

4. Skills Gaps Extend Beyond Technical Competencies

Employers consistently identified both technical skill shortages and gaps in employability skills—including communication, reliability, and problem-solving—as key barriers to hiring and retention.

5. Strong Education Pipeline Exists, but Alignment and Timing Challenges Persist

Region 3 benefits from a robust education and training ecosystem spanning K–12, community colleges, higher education, and workforce training programs.

However, gaps remain in aligning education pathways with real-time industry demand, as well as in maintaining student engagement throughout the pipeline—particularly between middle school exposure and high school program enrollment.

Strategic Themes

To address these challenges and strengthen the regional talent pipeline, the report identifies several priority strategies:

Shift to Employer-Led, Outcome-Driven Collaboration

The Talent Pipeline Management® (TPM) framework provides a structured, employer-led approach to defining workforce demand and aligning partners.

Transitioning from advisory-based engagement to employer-driven collaboratives will improve coordination and measurable outcomes.

Expand Flexible Training and Instruction Models

Innovative public-private training approaches—including employer-delivered instruction, embedded industry instructors, and shared faculty models—can help address instructor shortages and increase training capacity.

Strengthen Work-Based Learning Continuum

Expanding career awareness, exploration, and work-based learning opportunities will improve talent pipeline development. This includes addressing gaps between middle school exposure (GO TEC®) and high school CTE participation, as well as increasing employer participation through flexible engagement models.

Scale Registered Apprenticeship as a Primary Workforce Strategy

Registered Apprenticeship is a high-impact, employer-driven model that aligns directly

to high-demand occupations and supports both entry-level and incumbent worker development. The region has demonstrated significant growth in apprenticeship participation, supported by intermediary organizations such as the Institute for Advanced Learning & Research.

Invest in Systems, Incentives, and Support Structures

Sustained expansion of workforce initiatives will require coordinated investment in employer incentives, program infrastructure, and wraparound services to reduce barriers for both employers and participants.

Conclusion

GO Virginia Region 3 has built a strong foundation for workforce development through collaborative partnerships, early talent pipeline initiatives such as GO TEC®, and growing work-based learning and apprenticeship systems. However, to fully meet current and future workforce demand in advanced manufacturing & advanced materials and controlled environment agriculture, the region must strengthen alignment between employers and training providers, expand flexible and scalable engagement models, and invest in the systems and intermediaries that support employer-led solutions.

By implementing the strategies outlined in this report, Region 3 is well-positioned to transition from a collection of strong individual programs to a cohesive, demand-driven talent pipeline system—one that supports economic growth, improves workforce outcomes, and ensures long-term regional competitiveness.

Talent Pathways Initiative Overview & Introduction

The Talent Pathways Initiative was designed to support the analysis of regional workforce needs and the identification of the skills and training that can help prepare Virginians to meet regional labor demand. This analysis should provide a data-driven foundation for future investments and identify strategies to better align workforce development with industry demand.

All Talent Pathways Initiative planning periods must include:

1. Development of industry coalitions to guide and advise on project work
2. Completion of a qualitative/quantitative analysis of workforce needs for the industry/industries chose by the regional council
3. Completion of a gap analysis of jobs needed to help the industry/industries grow
4. Identification of skills & training needed for individuals to fill those jobs

5. Development of an asset map of the region's training providers who could support unmet needs
6. Identification of strategies and future projects to meet unmet needs

GO Virginia Region 3 is a fifteen-locality region in south central Virginia including Amelia, Brunswick, Buckingham, Charlotte, Cumberland, Halifax, Henry, Lunenburg, Mecklenburg, Nottoway, Patrick, Pittsylvania, and Prince Edward counties and the cities of Danville and Martinsville. Since 2018, Region 3 has partnered with the Institute for Advanced Learning and Research (IALR) to serve as a sector intermediary to support both the advanced manufacturing (GO TEC®) & controlled environment agriculture sectors, work-based learning initiatives (EmPOWER), and healthcare sectors (Southern Virginia Partnership for Health Science Careers; SVPHSC). IALR served as the Region 3 Talent Pathway Initiative project manager, leveraging their existing partnerships to advance the TPI effort.

Region 3's Growth and Diversification Plan (2023) supports the following target sectors: Advanced Manufacturing and Advanced Materials, Agriculture and Food Processing, Controlled Environment Agriculture, Business Services, Healthcare, High Value Natural Resource Products and Energy, and IT and Communication Services. Region 3 also supports Talent Development as a Collaborative Priority. These sectors were selected by Region 3 based on existing assets and industry mix, employment and wage growth potential by sector, and alignment to Virginia Economic Development Partnership (VEDP) efforts. This Talent Pathways Initiative effort focused on Advanced Manufacturing and Advanced Materials (NAICS 313110 – 399999) and Controlled Environment Agriculture (food manufacturing; NAICS 111400, 112500, 115000)- working to quantify and verify employment demand aligned to workforce supply (training & education) and living wage needs.

Methodology

The Region 3 implementation team leveraged and engaged existing coalitions to advance the Talent Pathways Initiative effort. These coalitions included: the GO TEC Advisory Council, community college and K12 CTE advisory councils, regional chamber manufacturing roundtables, and workforce development boards. Additionally, the Institute for Advanced learning and Research partnered with the U.S. Chamber Foundation to offer the [Talent Pipeline Management \(TPM\) Academy®](#) to regional industry, education, and workforce development partners. The TPM approach is a

demand-driven strategy to create real career pathways with talent pipelines aligned to business needs.

The Institute for Advanced Learning & Research contracted with Chmura Economics & Analytics to quantify job demand in strategic sectors, assess gaps based on workforce projections, and align opportunities to the current living wage requirements based on family size. These findings were published in November 2025 in the [Southern Virginia Living Wage & Job Availability Study](#).

The Chmura study and VOEE data were further informed by industry participants in the TPM Academy®. Participants informed current workforce gaps- considering current retention rates and anticipated retirements and projected needs due to anticipated growth. SVRA and Virginia's Growth Alliance, regional economic development organizations, along with input from VEDP, informed job growth potential based on economic development activity across the region.

The 2025 SVRA Workforce Pipeline Report, GO TEC®, VOEE, and VDOE data were utilized to map relevant regional CTE and higher education programs, including enrollment and completion trends. Stakeholder input from the Southern Virginia TPM Academy® and regional Futures Summit further informed this asset mapping, with additional insights from TPM Academy industry participants and regional coalitions helping to identify education, training, and work-based learning needs. EmPOWER work-based learning programs were also mapped to employer demand, with particular attention to Registered Apprenticeship opportunities. Complementing these data sources, a qualitative survey of Region 3 manufacturing employers was conducted using open-ended questions and anonymous electronic responses, which were analyzed through thematic coding to identify common workforce challenges, needs, and priority areas for action.

To further validate alignment between workforce demand and training strategies, the project team conducted a crosswalk analysis mapping Registered Apprenticeship occupations to Standard Occupational Classification (SOC) and North American Industry Classification System (NAICS) codes. This analysis was used to assess how apprenticeship pathways correspond to high-demand occupations and priority industries within the region. Detailed findings from this analysis are included in Appendix B.

To complement quantitative labor market analysis and regional stakeholder input, IALR incorporated a best practice study tour as a distinct component of the methodology.

Through participation in the [“Building Pathways: Youth apprenticeship Manufacturing Intensive, hosted by the Partnership to Advance Youth Apprenticeship \(PAYA\)”](#) in Charleston, South Carolina, Region 3 stakeholders engaged in a structured, field-based examination of established youth apprenticeship models. This approach provided direct exposure to a mature, employer-driven apprenticeship ecosystem and supported cross-regional comparison of program design, implementation, and sustainability strategies. Insights gained through this experience were used to validate regional findings, identify scalable practices, and inform the development of recommendations related to work-based learning and Registered Apprenticeship expansion in Region 3’s priority sectors.

Methodology at a Glance

Chmura Southern Virginia Living Wage & Job Availability Study
U.S. Chamber Foundation’s Talent Pipeline Management Academy®
Regional Coalition Engagement
Manufacturing Employer Qualitative Workforce Survey
Registered Apprenticeship Occupation NAICS & SOC Code Mapping
Youth Apprenticeship Best Practice Visit: “Building Pathways: Manufacturing Intensive” hosted by the Partnership to Advanced Youth Apprenticeship (PAYA)
Future’s Summit
2025 SVRA Workforce Pipeline Report

Limitations of Data & Analysis

Given the use of both quantitative and qualitative data, this report includes several inherent limitations. The insights and conclusions presented in this Talent Pathways Initiative Report are framed within the following parameters:

- The availability of real-time data presents a limitation. Analysis of postsecondary and K–12 CTE program offerings and industry-aligned certifications are based on the most recent data available, which often do not reflect the current, or even previous year. In many cases, program data corresponds to the 2023 academic

year, or even earlier in some cases, rather than 2025, potentially overlooking recent expansions, updates, or newly developed pathways.

- The Controlled Environment Agriculture (CEA) analysis in this report is subject to limitations. While well-poised for expansion, the industry presence in GO Virginia Region 3 is currently limited, with only one primary employer, AeroFarms, operating within the region in Q1 2025. As a result, findings may not fully reflect the diversity of workforce needs that would emerge in a more established CEA cluster. Additionally, the data used in this analysis represents the most recent available sources but spans multiple years, and may not fully capture current or rapidly evolving industry conditions. These factors should be considered when interpreting the results.

Regional Workforce Trends

The Living Wage and Job Availability Study conducted by Chmura included a comparative analysis of job postings from June 2017 and June 2025. From 2017 to 2025 there was a shift in the two industry sectors with the largest number of job postings. In June 2017, the largest sector by job openings was the retail trade sector with 30% of openings, followed by healthcare and social assistance with 18%. In June 2025, over a third of openings (36%) were in the health care and social assistance sector and just 16% in retail trade. In June 2017, job postings were more concentrated in lower-wage sectors than in June 2025, even when factoring in changes to minimum wage over that time. All of the family types defined in the study performed better in June 2025 than in June 2017 except for families with two adults without children, for which 100% job postings could support a living wage in both periods.¹ Despite improvements, Region 3 still lags behind state averages in wages and household income, and disparities persist among subregions.² The percentages of job postings requiring various levels of education, suggests that GO Virginia Region 3 has made progress on transitioning from lower-wage, lower-skilled jobs to higher-wage, higher-skilled jobs from 2017 to present. Chmura's five-year forecast indicates that the region may be at risk of swinging back towards an abundance of occupations requiring a high school diploma or less (Figure 1).

¹ Southern Virginia Living Wage & Job Availability Study

² GO Virginia Region 3 December 2025 Growth & Diversification Plan

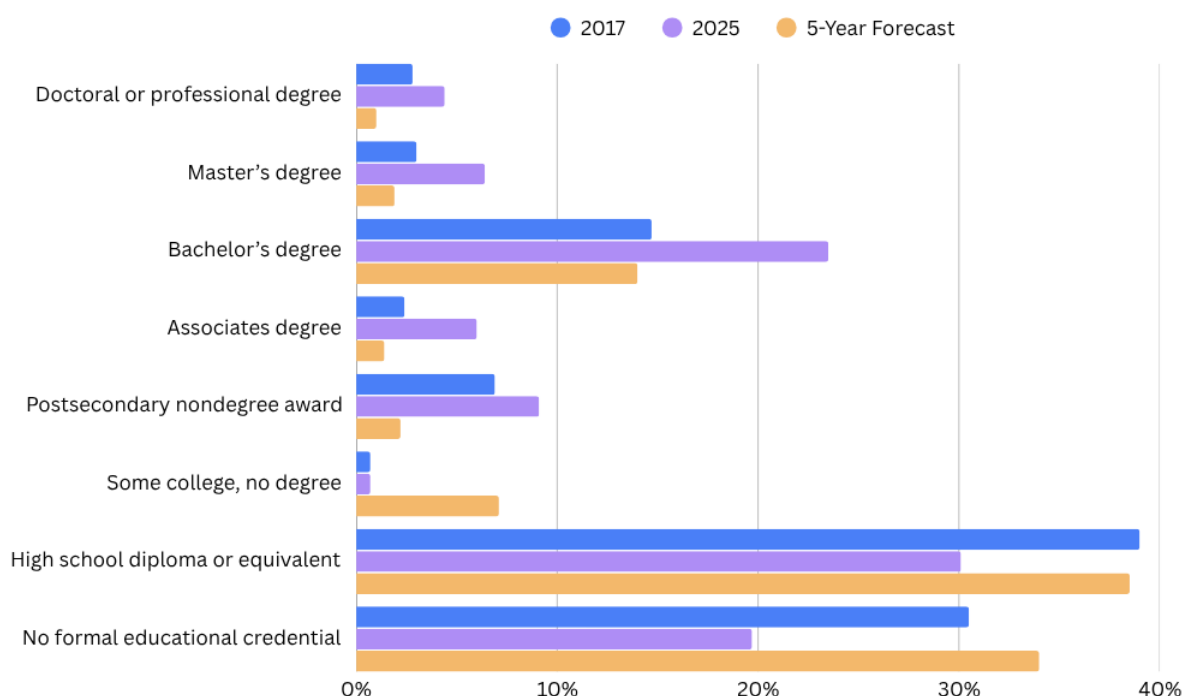


Figure 1. Job Openings by Education Attainment in GO Virginia Region 3- 2017, 2025, and 5 Year Forecast

Chmura used its proprietary JobsEQ technology platform to evaluate whether the GO Virginia 3 region has the capacity to fill living wage jobs. In 2025 Q1, the GO Virginia 3 region had an estimated available workforce of 14,483. This number includes an estimated annual new labor supply into the regional workforce of 8,169. With open positions of 15,383, this indicated that the total number of available positions exceeded the available workforce by 900 in the region. When looking at only those job postings with wages greater than or equal to the average living wage for the region of \$14.56, the available workforce exceeds available positions in the region, suggesting the labor shortages cited in the study are driven by lower-wage positions. When filtered by average living wage, only twenty-four job postings from Q1, 2025 were removed from the production occupation group, indicating that manufacturing is not a large source of these lower-wage positions.

Chmura also forecasted the demand for jobs in the GO Virginia 3 region over the next five years. Total demand does not represent net expansion, but hiring needs to cover sector growth as well as replacements for retirements and turnover. Healthcare and social assistance comprises the highest proportion of demand with 17.2% of the total 5-year forecasted demand in the region. Demand is also expected to be high in the

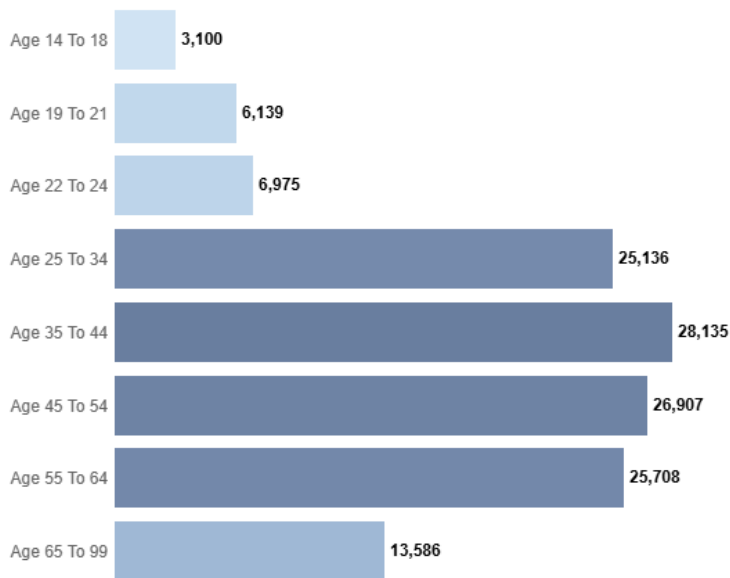
retail trade sector (13.8%), accommodation and food services sectors (13.8%), and the manufacturing sector (12.6%) according to the study.¹

Net in-migration patterns are stabilizing the population; however, with an aging workforce population 4.1% higher than the rest of the state, workforce demand will be significantly impacted by retirement. Across sectors, current employer demand is driven far more by replacement needs (exits and transfers) than by net new growth, keeping near-term hiring volumes elevated even in industries experiencing modest growth.²

Workforce 10 Year Age Out



Workforce Age Distribution



Workforce Age Distribution for GO Virginia Region 3 (Source: VOEE- Virginia Education & Workforce Dashboard)

SIGNIFICANT ECONOMIC DEVELOPMENT ANNOUNCEMENTS

Manufacturing Cluster

Job Demand & Workforce Needs

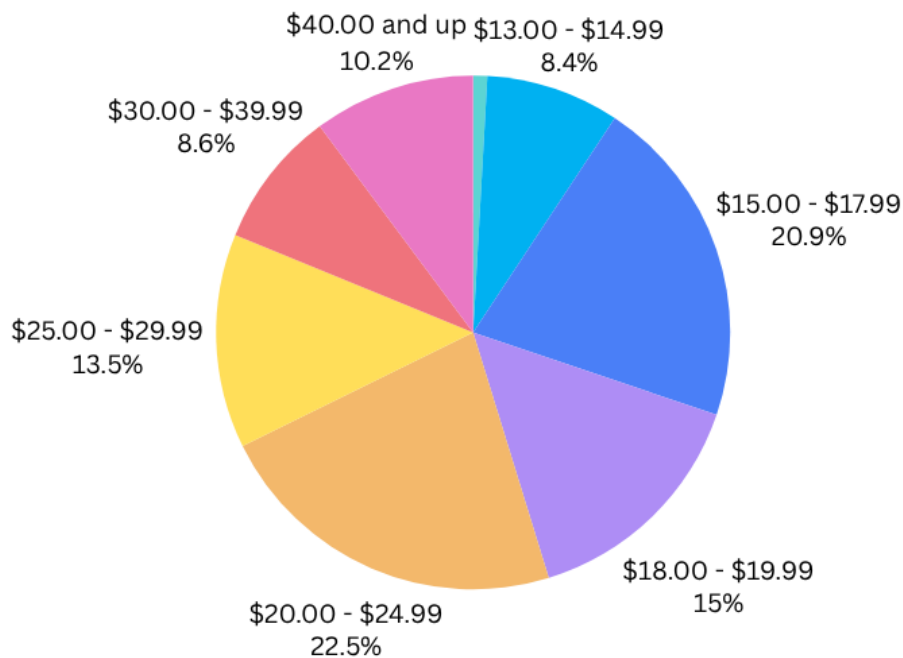
Manufacturing was the sixth largest sector by job openings in the first quarter of 2025 with 5.9% (910) of job openings in GO Virginia Region 3 with the highest demand for

Maintenance and Repair Workers, General and *Production Workers, All Other* being the greatest with 71 job openings each.

Job Openings by Occupation (Top 25) in the Manufacturing Sector in GO Virginia Region 3, 2025 Q1	
Occupation	Job Openings
Maintenance and Repair Workers, General	71
Production Workers, All Other	71
Laborers and Freight, Stock, and Material Movers, Hand	52
First-Line Supervisors of Production and Operating Workers	46
Merchandise Displayers and Window Trimmers	41
Stockers and Order Fillers	36
Human Resources Specialists	23
Sales Representatives of Services, Except Advertising, Insurance, Financial Services, and Travel	18
Shipping, Receiving, and Inventory Clerks	18
Quality Control Analysts	17
Electrical Engineers	16
Industrial Truck and Tractor Operators	16
Architectural and Engineering Managers	14
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	14
Inspectors, Testers, Sorters, Samplers, and Weighers	13
Retail Salespersons	13
Heavy and Tractor-Trailer Truck Drivers	12
Occupational Health and Safety Specialists	12
Business Operations Specialists, All Other	11
First-Line Supervisors of Mechanics, Installers, and Repairers	11
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	11
First-Line Supervisors of Office and Administrative Support Workers	10
Computer User Support Specialists	9
First-Line Supervisors of Retail Sales Workers	9
Industrial Engineers	9
Source: Chmura & JobsEQ	

Jobs in manufacturing are more concentrated at the middle wage ranges than the region overall with the highest concentration in the \$20.00 - \$24.99 wage range (22.5%). The manufacturing sector was less concentrated at the lower end with only 0.9% of job openings in the \$12.41 - \$12.99 range (2.20% in the region overall), and it was less concentrated at the higher-end with 8.6% in the \$30.00 - \$39.99 range (19.4% in the region overall) and 10.2% in the \$40.00 and up range (13.80% in the region overall).

Job Openings by Wage Range in the Manufacturing Sector in the GO Virginia 3 Region, 2025 Q1



The percentage of the available jobs that pay above living wage in the manufacturing sector is qualitatively similar to the percentage (all sectors) for the entire region for families with two adults, both working, since they have lower hourly rate thresholds. The decrease in opportunity in the upper hand of the wage distribution in the manufacturing sector presents a challenge for households with one adult or two adults but only one working, and with more than one child.

The following table shows the top twenty certifications in manufacturing sector job openings and their proportion in job openings in Go Virginia Region 3 during Q1 2025.

Top 20 Certifications in Manufacturing Sector Job Openings, GO Virginia Region 3, 2025 Q1	
Certification	Proportion of Manufacturing Job Openings with Specified Certifications
Commercial Driver's License (CDL)	17.5%
Certification in Cardiopulmonary Resuscitation (CPR)	8.5%
OSHA 30	4.9%
First Aid Certification	4.5%
Automotive Service Excellence (ASE) Certification	3.7%
Certified Public Accountant (CPA)	3.7%
Class A Commercial Driver's License (CDL-A)	3.7%
EPA Universal Certification	3.7%
OSHA 10	3.7%
Certified Safety Professional (CSP)	3.3%
Project Management Professional (PMP)	3.3%
EPA Section 608 Certification (EPA 608)	2.8%
Secret Clearance	2.4%
Licensed Professional Engineer	2.0%
OSHA 500	2.0%
Certified Industrial Hygienist (CIH)	1.6%
Certified Welding Inspector (CWI)	1.6%
Engineer in Training (EIT)	1.6%
Forklift Certified	1.6%
HAZMAT	1.6%

Findings from a qualitative survey conducted by IALR of Region 3 manufacturing employers reinforce that frontline production roles, manufacturing associates and machine operators are essential to daily operations but must be supported by a broader pipeline of skilled trades, technical talent, and frontline supervisors. Employers consistently identified skilled trades and technical positions, including maintenance

technicians, electricians, and controls specialists, as the most difficult roles to fill, due to limited availability of candidates with the required experience and technical expertise. At the same time, employers reported ongoing challenges sustaining a reliable pipeline of entry-level workers, highlighting a dual shortage across both high-skill and entry-level roles. Survey respondents attributed hiring difficulties to a combination of factors, including:

- Skills Gaps
- Limited local labor supply
- Workforce Readiness concerns

Employers emphasized that both technical competencies (e.g., industrial maintenance, electrical systems, automation) and durable skills (e.g., problem solving, communication, adaptability) are critical for success, with soft skills often presenting the greatest challenge. These findings underscore the need for workforce strategies that simultaneously address technical training, work-based learning, and employability skill development to meet current and future industry demand.

Controlled Environment Agriculture Cluster

Job Demand & Workforce Needs

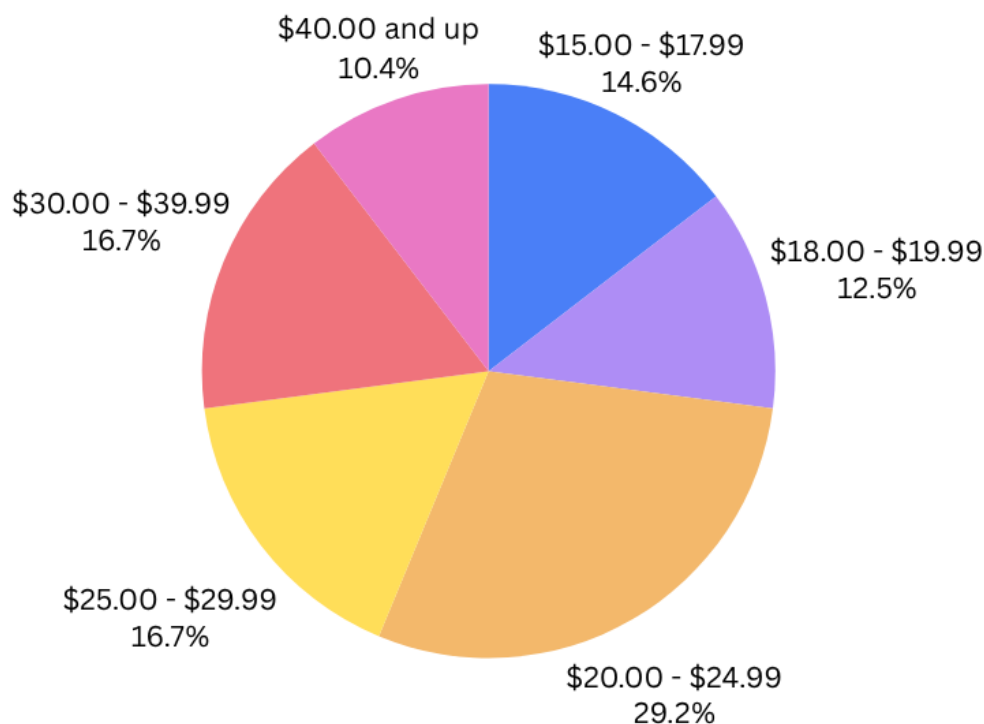
At the time of the Chmura, Southern Virginia Living Wage & Job Availability study there was only one controlled environment agriculture company with job postings in the GO Virginia 3 region: AeroFarms. AeroFarms opened a vertical farming facility in Danville in 2022 and since moved their headquarters to the city. There were 48 active job postings at AeroFarms in 2025 Q1.

Job Openings by Job Title in the Controlled Environment Agriculture Industry in GO Virginia Region 3, 2025 Q1	
Occupation	Job Openings
HACCP & Quality Assurance Coordinator	5
Food Safety & Quality Assurance (FSQA) Technician	4
HVAC Technician	3
Maintenance Controls Engineer	3
Assistant Grower	2
Facility Security & Safety Officer	2
Forklift Operator	2
Grow Room Technician	2
Multi-Craft Maintenance Technician	2
Operations	2
Operations Manager	2
Production Supervisor	2
Senior Project Manager	2
Controls Technician	1
Executive Assistant	1
Facilities Technician	1
General Employment Application	1
Nutrient Prep Technician	1
Packaging Technician	1
Plant Controller	1
Production Supervisor- Night Shift	1
Production Team Lead	1
Robotic Cell / Combiner Technician	1
Senior Controls Engineer - SCADA Systems (Ignition, CODESYS)	1
SME-Process Technician - Sanitation Tunnel	1
Team Lead	1
Tower CIP Tech	1
Warehouse Technician	1
Total	48

Source: Chmura & JobsEQ

Jobs in the Controlled Environmental Agriculture industry have a higher wage floor than the region overall with wages starting in the \$15.00 - \$17.99 range. The wage range with the most job openings (\$20.00 - \$24.99) is also higher than the region overall and accounts for 29.2% of job openings in the industry.

Job Openings by Wage Range in the Controlled Environment Agriculture Industry in the GO Virginia 3 Region, 2025 Q1



Living wage jobs availability for the controlled environment agriculture industry in GO Virginia Region 3 is better than the region overall for six of the twelve family types defined in the Chmura report. These include families with one adult and one child, two adults (one working) with less than two children, and two adults (both working) with one or more children. Families with one adult with one child and families with one adult with three children were roughly aligned with the region overall as were families with two adults (one working) with two children and two adults (one working) with three.¹

While current CEA employment in Region 3 is limited, the industry is highly technical and growth-oriented, requiring a diverse workforce that blends agriculture, engineering, and advanced manufacturing skill sets. Unlike traditional agriculture, CEA operations

rely on automated growing systems, sensor technologies, climate control systems, and data-driven production processes, creating demand for a wide range of occupations across multiple skill levels.

At the high-skill level, employers require engineers, information technology specialists, and plant scientists to design, manage, and optimize production systems. At the mid-skill level, technical roles such as industrial maintenance technicians, HVAC specialists, and production supervisors are critical to maintaining system performance, ensuring operational continuity, and minimizing downtime in highly controlled environments. In addition, CEA operations depend on logistics, warehousing, and operational roles, including general and operations managers and distribution personnel, to support efficient movement of inputs and outputs.

Despite competitive wages and strong growth potential, Region 3 faces several workforce challenges related to CEA development. These include a limited supply of specialized talent, particularly in hybrid roles that combine engineering, IT, and agricultural knowledge. Employers report difficulty filling positions in technical operations, maintenance, and logistics, often requiring recruitment from outside the region.

At the same time, there is a strong opportunity to leverage overlap between manufacturing and CEA workforce needs. Many of the technical skill requirements in CEA, particularly in automation, maintenance, and systems operations, closely align with advanced manufacturing occupations. This presents a strategic opportunity for Region 3 to utilize existing training systems and expand work-based learning and Registered Apprenticeship pathways that can serve both sectors.

Category	Manufacturing	Controlled Environment Agriculture (CEA)	Shared Skills/Overlap
Entry-Level Roles	Production Workers, Machine Operators, Assemblers	Production Technicians, Grow Technicians, General Labor	Basic operations, safety, reliability, teamwork
Mid-Skill Technical Roles	Industrial Maintenance Technicians, Electricians, CNC Technicians	Maintenance Technicians, HVAC Specialists, Systems Operators	Mechanical systems, electrical systems, troubleshooting, maintenance

Advanced Technical Roles	Mechatronics Technicians, Robotics Technicians, Automation Specialists	Automation Technicians, Environmental Systems Specialists, Controlled Systems Operators	Automation, PLCs, sensors, system integration
Engineering & High-Skill Roles	Industrial Engineers, Process Engineers, Quality Engineers	Agricultural Engineers, Plant Scientists, Data/Systems Engineers	Process optimization, system design, data analysis
Operations & Support Roles	Production Supervisors, Logistics Coordinators, Supply Chain Staff	Operations Managers, Warehouse Staff, Distribution & Logistics Personnel	Logistics, scheduling, inventory management
Core Technical Skills	CNC machining, industrial maintenance, automation, quality control	Climate control systems, irrigation systems, automation, environmental monitoring	Automation, troubleshooting, systems thinking
Digital & Data Skills	PLC programming, robotics, production data systems	Sensor systems, environmental monitoring, data analytics	Data literacy, system monitoring, technology integration

Educational Asset Map & Talent Pipeline

The Southern Virginia Regional Alliance's 2025 Workforce Pipeline Report highlighted a labor shed calculation that included high school industrial CTE program enrollment within a 45 mile radius of IALR (150 Slayton Ave., Danville, VA); Community & Technical College CTE Program enrollment within a 60 mile radius, both Undergraduate and Graduate Engineering & Information Technology program enrollment within a 120 mile radius, and the Accelerated Training in Defense Manufacturing program (located in Danville, VA) enrollment. The aforementioned programs within the defined region represent a workforce pipeline of 27,886.

SVRA Workforce Pipeline Enrollment, Manufacturing, Engineering & IT, 2024-2025

	Public High Schools (45 mile radius)	Community & Technical Colleges (60 mile radius)	Universities- Four-Year Degrees (120 mile radius)	Universities- Post-Graduate Degrees (120 mile radius)	ATDM	Totals
Additive Manufacturing					76	76
Automotive	533	702				1235
CDL Class A Endorsement		106				106
Construction	805	213				1018
Electrician/ Electricity	120	469				589
Engineering	141	817	4899	3489		9346
HVAC	106	494				600
Information Technology	1191	2530	4321	1889		9931
Machining	58	342			343	743
Manufacturing Technology	87					87
Mechanics & Repairers	100	107				207
Metrology					116	116
Non-Destructive Testing					164	164
Precision Metal Working		1597				1597
Robotics & Automation	8					8
Transportation, Distribution, & Logistics						0
Welding	138	1501			424	2063
Totals	3287	8878	9220	5378	1123	27886
*Radius of 150 Slayton Ave., Danville, VA						
**1,034 high school students were in manufacturing dual enrollment programs.						

While the SVRA report's geographic scope was designed to reflect typical workforce mobility patterns by education level, it does not include all of GO Virginia Region 3 and includes individuals who are in and are also being recruited by employers in the more metropolitan/urban areas: Raleigh, Greensboro, Roanoke, etc. of that geography.

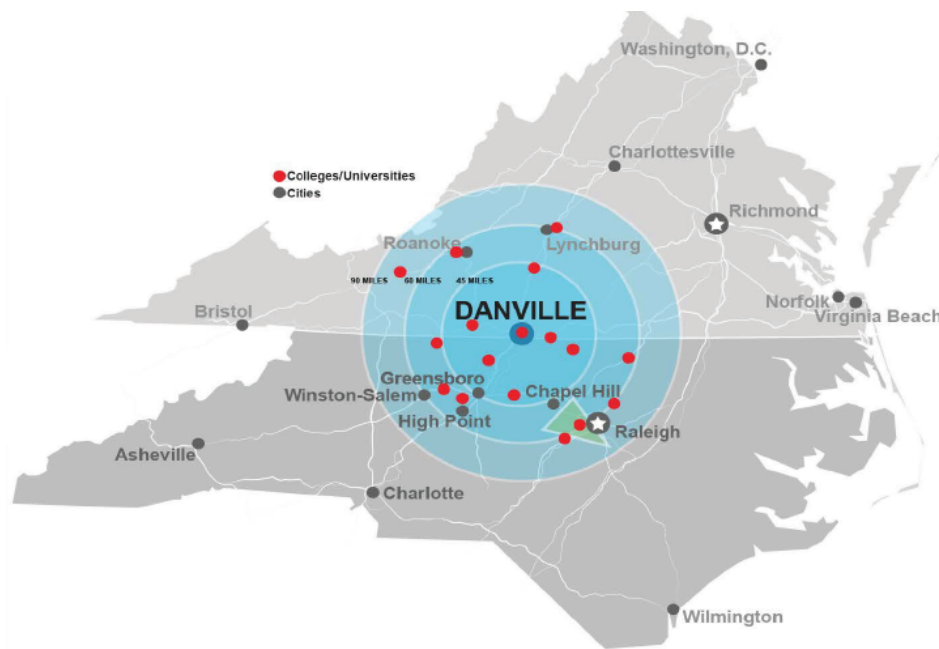


Fig. 2. Colleges & Universities within the SVRA's Workforce Pipeline Report Region³

What follows is education and training data specific to GO Virginia Region 3; however, it is important to note, as the SVRA report quantified, these assets are a part of a much larger, regional, economic development labor shed, spanning into North Carolina.

GO Virginia Region 3's education ecosystem includes fifteen K-12 school divisions (containing 20 high schools and 3 additional Career & Technical Education Centers), three community colleges (with thirteen locations), three higher education centers, and three 4-year institutions.

Middle School

GO TEC®, Great Opportunities in Technology & Engineering Careers, is a talent pathway initiative that introduces middle school students to the strategic sectors of Healthcare Technologies, Automation & Robotics, IT Coding & Networking, Precision Machining, Metrology, Mechanical Engineering, Electrical Engineering, Manufacturing Engineering, Welding, Precision Agriculture and Energy. GO TEC® uses a hub-and-spoke model to progressively generate the desired robust talent pipeline across Southern and Southwest Virginia. Middle schoolers are introduced early to the occupations and base skill training in Career Connections Labs, an example of a spoke. They are then connected in high school to expanded career and technical courses, industry certification programs and dual-enrollment training opportunities with higher

³ Southern Virginia Regional Alliance 2025 Workforce Pipeline Report

education partners. Finally, they may progress to advanced level training at a hub educational provider. GO TEC® began with a pilot of middle school Career Connection Labs in Region 3 in 2018 and has since expanded to GO Virginia Regions 1, 2, 4, & 5. These Career Connection Labs provide hands-on, engaging exposure to sectors of strategic importance to the region(s)' youth. GO TEC® is an intentional effort to pull regional talent pipelines down into earlier K-12 grades.

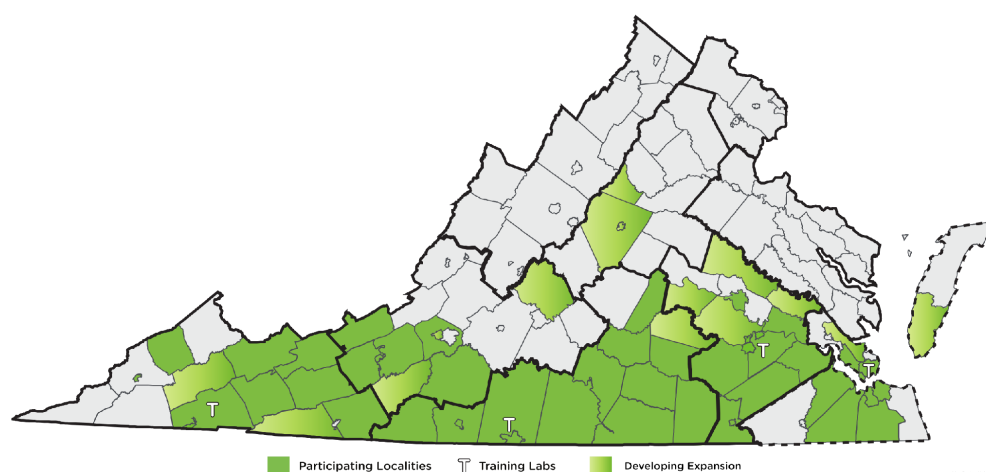


Image 3. Localities utilizing GO TEC® for the 2025-2026 Academic Year and planned expansion for the 2026-2027 Academic Year

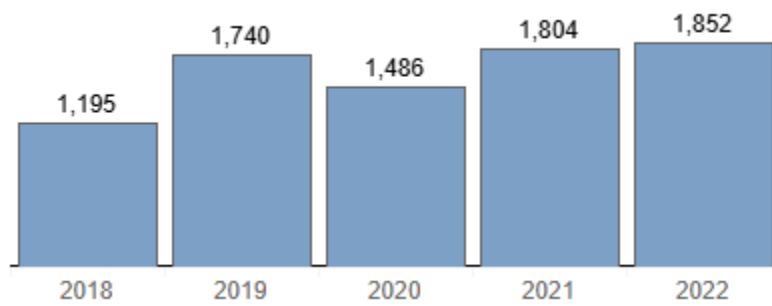
The total middle school GO TEC® program enrollment for GO Virginia Region 3 for the 2024- 2025 school year was 3,638 students.

GO Virginia Region 3 GO TEC Enrollment for 2024-2025	
Brunswick County	135
Charlotte County	140
Cumberland County	201
City of Danville	392
Halifax County	288
Henry County	721
Lunenburg County	147
City of Martinsville	191
Mecklenburg County	69
Nottoway County	119
Patrick County	38
Pittsylvania County	979
Prince Edward County	218
TOTAL	3,638

With the addition of GO TEC® programming in Amelia County for the 2026–2027 academic year, the initiative will reach fourteen of the fifteen GO Virginia Region 3 localities—reflecting near full regional participation in this early talent pipeline strategy.

High School

GO Virginia Region 3 2022 CTE program completer data (the most recent year for which it was available) shows a 55% increase in CTE completions since 2018.

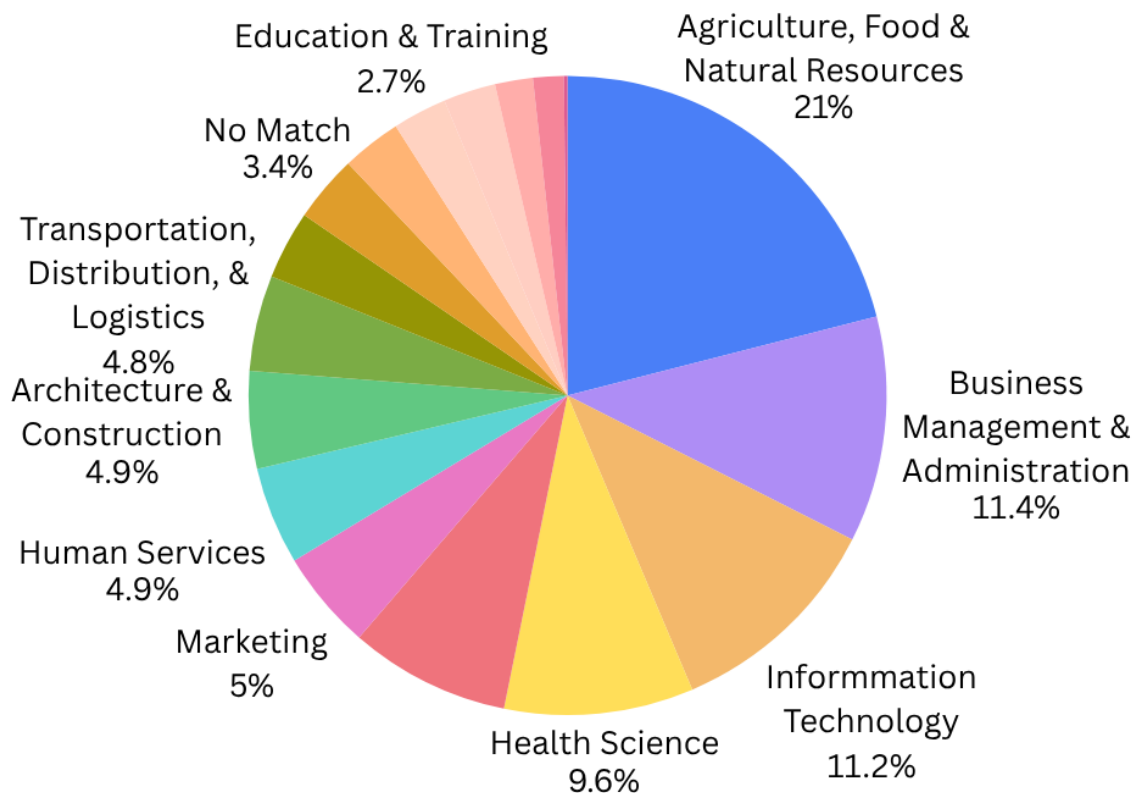


All Career & Technical Education Completions by Year in GO Virginia Region 3⁴

While an initial comparison of the reported regional GO TEC® enrollment with CTE completers may suggest the region is losing a significant portion of the CTE pipeline from middle to high school, It is important to note that the GO TEC® enrollment reported here is for the 2024-2025 academic year, while the CTE completion data is from 2022. To better determine the approximate impact of GO TEC® enrollment on CTE completion the 2024-2025 GO TEC® data should be compared to 2026-2027 CTE completion data. As GO TEC® first launched in 2018, its CTE impact isn't captured here as the first middle school program participants likely wouldn't complete a CTE program until 2023.

For Superintendent Region 8- Southside (of which most of GO Virginia Region 3 is a part- all but five localities) the top three career clusters with the largest number of completers in 2022 were Agriculture, Food & Natural Resources (21% of all completions), Business Management & Administration (11.4%), and Information Technology (11.2%).

⁴ Virginia Office of Education Economics- Virginia Education & Workforce Alignment Dashboard



CTE Completions (Graduation Year 2022) by Career Cluster for Superintendent Region 8 (Southside)⁴

The 2022 completion data shows a need to shift CTE course offerings and student enrollment to better support the need for skilled (but non-degree requiring) manufacturing and CEA roles. Twenty-one percent of CTE completers in Agriculture, Food, & Natural Resources represents a strong regional interest in Agriculture and Natural Resources and presents an avenue to increase awareness of opportunities in CEA. While only 2.7% of CTE completers in 2022 were in the Manufacturing Career Cluster, the SVRA Pipeline Report shows that a major shift is already underway. In 2022, VOEE reported that there were 29 total Manufacturing CTE completers in all of GO Virginia Region 3. For the 2024-2025 academic year SVRA cited 231 students enrolled in Manufacturing Technology, Machining, and Robotics & Automation in just the Region 3 school divisions within a 45-mile radius of 150 Slayton Ave. That is a massive shift in just three years' time and highlights the need for more real-time educational data through state sources like VDOE and VOEE.

Post-Secondary

The top ten post-secondary Advanced Manufacturing educational programs by degrees awarded (in the 2024-2025 academic year) for GO Virginia Region 3 are listed below.

CIP Code	Program Title	Degrees Awarded
52.0201	Business Administration & Management, General	486
48.0508	Welding Technology/ Welder	180
15.0699	Industrial Production Technologies/ Technicians, Other	117
15.0303	Electrical, Electronic, & Communications Engineering Technology/ Technician	92
47.0105	Industrial Electronics Technology/ Technician	77
15.0612	Industrial Technology/ Technician	68
26.0101	Biology/ Biological Science, General	53
15.0613	Manufacturing Engineering Technology/ Technician	24
48.0599	Precision Metal Working, Other	12
03.0104	Environmental Science	12

The top twelve Occupations in Advanced Manufacturing by projection of average number of annual openings over the next five years are:

SOC Code	Occupation	Avg. Annual Openings
<i>51-2098</i>	<i>Miscellaneous Assemblers & Fabricators</i>	154
51-1011	First-Line Supervisors of Production & Operating Workers	106
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	95
49-9041	Industrial Machinery Mechanics	66
<i>51-9198</i>	<i>Helpers- Production Workers</i>	60
49-1011	First- Line Supervisors of Mechanics, Installers, & Repairers	57
<i>51-6031</i>	<i>Sewing Machine Operators</i>	47
51-7041	Sawing Machine Setters, Operators, & Tenders, Wood	43
<i>51-6011</i>	<i>Laundry & Dry-Cleaning Workers</i>	38
51-4121	Welders, Cutters, Solderers, & Brazers	35
<i>51-9041</i>	<i>Extruding, Forming, Pressing, & Compacting Machine Setters, Operators, & Tenders</i>	35
<i>51-9199</i>	<i>Production Workers, All Other</i>	34

**Source: Virginia Office of Education Economics- Virginia Education & Workforce Alignment Dashboard*

This data provides a snapshot of the alignment between the top Advanced Manufacturing post-secondary educational programs in GO Virginia Region 3 and the top occupations (by demand). Six of the top twelve occupations' SOC Codes (italicized) do not have a match in the CIP (Classification of Instructional Programs) to SOC (Standard Occupational Classification) Crosswalk produced by the Institute of Education Sciences, indicating that formal, post-secondary education is not required for these roles. The data suggests that the region is currently producing more welders than there is regional demand. The demand for Industrial Machinery Mechanics suggests that more specific Industrial Mechanics & Maintenance Technology/Technician degrees may be needed; however, Industrial Production Technologies/ Technicians; Electrical, Electronic, & Communications Engineering Technology/ Technician; Industrial Electronics Technology/ Technician; Industrial Technology/ Technician; and Manufacturing Engineering Technology/ Technician programs would likely have transferable skills for Industrial Machinery Mechanic roles. Program providers should work closely with employers to ensure program completers have the skillsets they are looking for. Additionally, education partners should assist their program completers with communicating their transferable skills to employers- if a program degree or certificate is not a direct match to a role an employer is looking for, do program graduates know which alternative roles they may be well-suited to fill and how to communicate their transferable skills? Lastly, Biology programs having the seventh highest number of degrees annually is a great asset as the region seeks to attract and expand the controlled environment agriculture sector.

Through GO Virginia Region 3's layered educational and training programs, students are prepared to enter the workforce at multiple off-ramps — high school completion, technical credentials, associate degrees, four-year degrees, and advanced graduate study. As industrial expansion accelerates across Southern Virginia and neighboring counties, this coordinated and multi-level pipeline positions the region to meet increasing demand for skilled trades professionals, technologists, and engineers. With a strong foundation established, what is needed now is real-time alignment with industry needs and scale.

Strategies & Recommended Pathway Projects

Employer-led, Outcome-Driven Collaboratives

GO Virginia Region 3 has no shortage of industry coalitions, roundtables, and advisory boards. During the TPM Academy®, several employers shared that they are frequently—at times overwhelmingly—asked to participate in discussions about workforce challenges and sit on advisory boards. A consistent theme emerging from these conversations was that, while there is no lack of dialogue, employers often perceive that limited action follows. Many described participating in similar conversations across multiple groups without seeing measurable progress or coordinated outcomes.

Both employers and education and workforce partners agree that industry input is essential to building an effective regional talent pipeline. However, current engagement strategies must evolve to reduce employer fatigue and better translate input into action. Much of the existing engagement relies on high-level discussions, and employers primarily serving in an advisory capacity rather than as drivers of strategy and implementation. To achieve meaningful, measurable improvements in workforce outcomes, Region 3 must shift from conversation-based engagement to action-oriented, employer-led collaboratives.

The U.S. Chamber of Commerce Foundation's Talent Pipeline Management® (TPM) framework provides a proven, systematic approach for strengthening employer engagement and driving results. TPM applies supply chain principles to workforce development, positioning employers as the end customers of the talent system and empowering them to organize, communicate demand, and co-design solutions with education and workforce partners. Through TPM, employers move from advisory roles to actively managing talent pipelines—defining specific workforce needs, aligning partners around those needs, and tracking performance outcomes. Key elements that distinguish TPM from traditional partnership models include:

- Built on Industry Best Practices
- Authentically Employer-Led
- Generates Granular, Actionable Data on Employer Demand
- Provides a Structured and Agile Process for Collective Action and Decision-Making
- Engages the Full Spectrum of Talent Sourcing Partners
- Creates Shared Value, Competitiveness, and Accountability
- Focuses on Employer Return on Investment

Adopting the TPM approach would strengthen existing regional collaboratives by shifting the focus from input to impact. Under this model, employers collaboratively define priority occupations, identify required competencies, and establish clear performance metrics. Education and workforce partners then align programs and resources to meet those defined needs, creating a more responsive and efficient talent pipeline system.

A critical success factor highlighted throughout the TPM Academy® is the importance of a dedicated convener or intermediary role to lead and sustain this work. Regions that demonstrated the greatest progress and outcomes consistently had an individual or team responsible for advancing TPM efforts on a daily basis—coordinating employer collaboratives, organizing data collection, maintaining momentum, and ensuring accountability across partners. This role is not merely administrative; it requires strategic leadership, facilitation skills, and a deep understanding of both employer needs and workforce systems. As reflected in national TPM implementation models and the TPM National Learning Network, sustained success depends on having a neutral, trusted entity that can convene stakeholders, manage the process, and translate employer demand into actionable strategies. For GO Virginia Region 3, investing in a designated TPM convener or intermediary function would be essential to moving beyond fragmented engagement efforts and establishing a coordinated, employer-driven system that delivers measurable workforce outcomes.

Flexible Private/Public Training Models to Address Technical Training Shortages

GO Virginia Region 3 education partners cite persistent challenges in staffing technical education and workforce training programs. Education partners across the region consistently report difficulty recruiting and retaining qualified instructors for high-demand fields such as electrical work, heavy equipment operation, and other skilled trades. These challenges are largely driven by wage disparities, as individuals with the necessary technical expertise can often earn significantly higher wages working in industry than in educational or training roles. As a result, program capacity is constrained, limiting the region's ability to scale training opportunities to meet employer needs.

At the same time, employers are increasingly seeking greater control over workforce training, particularly in the context of Registered Apprenticeship programs. Many employers are choosing to develop in-house related technical instruction (RTI) models, allowing them to tailor training content to their specific processes, technologies, and

workforce expectations. Regional examples demonstrate the effectiveness and growing interest in these approaches. The Danville Area Training Center provides Emergency Medical Technician (EMT) training tailored to the needs of the Danville Life Saving Crew, while Spitzer Electric has become NCCER-certified to deliver electrician training internally.

The region is also leveraging innovative hybrid models that blur the traditional boundaries between industry and education. In one example, a Red Oak Construction employee is currently instructing heavy equipment operation through Southside Virginia Community College, bringing current industry expertise directly into the classroom. These types of arrangements offer a practical solution to instructor shortages while ensuring training remains aligned with real-world practices and technologies.

To address ongoing technical training constraints and expand capacity, Go Virginia Region 3 should prioritize the development and scaling of flexible public-private training models, including:

- **Embedded Industry Instructors:**

Expand opportunities for industry professionals to serve as adjunct or contract instructors within community colleges, CTE programs, and workforce training initiatives, ensuring students receive instruction grounded in current industry practice.

- **Shared Faculty and Regional Instruction Models:**

Explore shared staffing approaches across institutions (e.g., instructors teaching at both Danville Community College and Patrick & Henry Community College), enabling more efficient use of limited instructional talent and expanding access to programs across the region.

- **Hybrid and Co-Delivered Training Programs:**

Develop models where instruction is jointly delivered by education providers and employers, combining foundational knowledge with hands-on, work-based application.

- **Employer-Delivered Training Models:**

Support employers in developing and delivering related technical instruction, particularly within Registered Apprenticeship programs, through certification pathways (e.g., NCCER) and alignment with state standards.

These approaches are supported by a growing recognition at the state level of the need for more flexible, employer-responsive workforce training systems. By leveraging both

public infrastructure (community colleges, CTE programs, workforce partners) and private sector expertise, Region 3 can build a more adaptable and scalable training ecosystem—one that reflects the realities of modern industry and leverages the full range of regional assets. This approach will be critical to meeting current and future workforce demands in advanced manufacturing, controlled environment agriculture, and other emerging sectors.

Strengthen the GO TEC® - Work-Based Learning Continuum

GO TEC® Career Connection Labs are designed to serve as an early talent pipeline builder, introducing students to high-demand career pathways through hands-on, exposure and foundational skill development in middle school. Ideally, this experience is seamlessly connected to the EmPOWER work-based learning (WBL) system, where students continue their career exploration, skill-building, and employer engagement through progressively more intensive experiences.

A consistent “GO TEC gap” has been identified for 9th and 10th grade students. After completing the GO TEC® Career Connections course in middle school, students often experience a delay before they can enroll in high school CTE programs, which typically begin in 11th and 12th grade. Without intentional engagement during this gap period, students may lose interest or connection to the career pathways introduced through GO TEC®.

Expanding access to short-term, high-impact work-based learning experiences during this transition period can help sustain student engagement, reinforce career awareness, and strengthen the overall talent pipeline. The following opportunities represent scalable, flexible approaches that can be aligned with employer needs and existing regional initiatives:

- **Job Shadowing**

Job shadowing provides short-duration, structured opportunities—typically ranging from a few hours to a full day—for students to observe employees in real workplace settings. Through guided observation and interaction, students gain exposure to day-to-day job responsibilities, workplace expectations, and career pathways within target industries. These experiences are especially valuable for 9th and 10th grade students, as they require minimal employer time commitment while offering meaningful exposure to real-world work environments.

- **Sector-Focused Camps**

Sector-focused camps are short-term, immersive experiences—typically ranging from multi-day to week-long programs—that provide hands-on learning aligned to specific industries such as advanced manufacturing, engineering, or controlled environment agriculture. These camps can be hosted by education providers, workforce partners, or employers, and often incorporate project-based learning, industry speakers, and facility tours. Camps reinforce technical concepts introduced in GO TEC® while allowing students to deepen their skills, explore different career roles, and build interest in high-demand fields at a critical point in their academic journey. These experiences also provide a structured way for employers to engage with students at scale.

- **Teamship®**

Teamship® is a project-based work-based learning model where students collaborate in teams to solve real-world challenges presented by employers. These experiences can take place in classrooms and are typically short-term but highly interactive. Students develop solutions, present their work, and receive feedback directly from employers. Teamship® helps students build durable skills such as teamwork, communication, and problem-solving. For 9th and 10th grade students, Teamship® provides an accessible entry point into work-based learning that does not require transportation or extensive scheduling coordination. Because Teamship® can take place in the classroom and each employer works with teams of students, it is highly scalable. It also requires a minimal time investment from employers while providing them with real ROI in the form of the students' solutions to their problem.

- **Additional Flexible WBL Experiences (e.g., Industry Tours, Guest Instruction)**

Additional short-term WBL experiences—such as structured industry tours, employer-led classroom instruction, and micro-internships—can also play a key role in sustaining engagement during the GO TEC® gap. Industry tours provide students with exposure to modern facilities and technologies, helping to shift perceptions of manufacturing careers. Guest instruction from industry professionals brings real-world application into the classroom and strengthens employer-education connections.

Collectively, these experiences help students maintain momentum in their career exploration journey, bridging the gap between middle school exposure and high school CTE participation. They also play a critical role in developing the employability (durable) skills that regional employers consistently identify as gaps in the current talent pool, including communication, professionalism, teamwork, and reliability.

In addition, expanding these work-based learning opportunities strengthens K–12 and employer connections, which were identified as a high priority by employers participating in the Manufacturing Employer Qualitative Workforce Survey. By engaging students earlier and more consistently, Region 3 can build a more informed, prepared, and connected future workforce pipeline aligned to the needs of its strategic industries.

Expansion of Registered Apprenticeship, Youth Registered Apprenticeship & Pre-Apprenticeship

Registered Apprenticeship is a demonstrated, industry-driven workforce strategy that enables employers to train, upskill, and retain a highly skilled workforce through a structured “earn-and-learn” model. Nationally, more than 90% of apprentices are retained in employment after completing their programs, demonstrating strong return on investment for both workers and employers.

In Virginia, Registered Apprenticeship continues to demonstrate strong growth and impact. As of March 2026, there are more than 15,000 active apprentices statewide—a 42% increase since 2022, and over 200 active manufacturing apprenticeship programs. This growth includes expanding participation among employers within GO Virginia Region 3, where several companies have established apprenticeship programs across critical technical occupations, as highlighted below.

Company	Apprenticeship Program Occupation(s)	Location
Insight Textiles	Boiler Operator & Electrician	Patrick county
Nilit America	Maintenance Electrician	Henry County
Owens-Illinois	Industrial Maintenance Technician & Mold Maker	Pittsylvania County
Huber Engineered Woods	Industrial Maintenance Technician, Electrician, Quality Assurance Technician	Halifax
Hitachi	Production Welder	Halifax
Reynolds Consumer Products	Industrial Manufacturing Technician	Halifax
Litehouse Foods	Industrial Maintenance Technician	Danville
JTI	Industrial Maintenance Mechanic	Danville

At its core, successful apprenticeship must remain industry-led, with occupational focus and skill development shaped directly by employer demand. Employers must be positioned as co-designers and drivers of apprenticeship programs, ensuring that training reflects current technologies, processes, and workforce needs. This model is highly adaptable and can be customized to meet the needs of individual companies or employer collaboratives across manufacturing and emerging controlled environment agriculture (CEA).

GO Virginia Region 3 currently has a relatively small, but growing number of formal, highly visible manufacturing Registered Apprenticeship programs. The region's continued progress in this area is supported by a strong network of workforce partners, including the Institute for Advanced Learning & Research (IALR), which serves as a neutral intermediary through its Expanding Talent through Registered Apprenticeship (ExTRA) program. ExTRA provides critical support to employers in program development, registration, administration, and resource coordination. Since 2022, IALR ExTRA has supported the registration of more than 40 program occupations and 170 apprentices across the region. Additional regional partners are also advancing apprenticeship as a workforce strategy. These efforts align with the Commonwealth's broader push to expand intermediary capacity and strengthen employer adoption of Registered Apprenticeship. Together, these partners are contributing to increased employer participation. At the same time, a robust talent pipeline is being developed through coordinated efforts across regional community colleges and universities, other postsecondary training providers, high school CTE programs, and middle school initiatives such as GOTECH®. These systems are increasingly aligned with industry needs and are producing a workforce equipped to support the continued expansion of Registered Apprenticeship.

To further validate Registered Apprenticeship as a targeted workforce solution, IALR conducted an analysis aligning USDOL approved apprenticeship occupations with Standard Occupational Classification (SOC) and North American Industry Classification System (NAICS) codes. This crosswalk confirms that apprenticeship programs directly correspond to the high-demand occupations driving the region's manufacturing and emerging CEA sectors, particularly in production, maintenance, and technical roles. This alignment demonstrates that Registered Apprenticeship is more than a theoretical workforce strategy, it is a targeted, data-driven solution that directly supports the core functions required for both traditional manufacturing and emerging CEA industries. By expanding apprenticeship pathways in these aligned occupations, Region 3 can more

effectively address its most critical workforce gaps while supporting long-term industry growth (A detailed breakdown of this analysis is provided in Appendix B).

Increase Apprenticeship Awareness and Visibility

Expanding Registered Apprenticeship in Region 3 begins with increasing awareness and positioning it as a high-quality, first-choice career pathway, on par with college and military service, not an alternative. Messaging must intentionally reach employers, educators, adult jobseekers, youth, parents, and the broader community, with tailored messaging for each audience.

However, awareness alone is not sufficient. Apprenticeship opportunities must also be highly visible, clearly labeled, and easy to access for both jobseekers and those who support their career decision-making. Employers and partners should prioritize transparently identifying and promoting available positions as Registered Apprenticeships across job boards, company careers pages, school-based platforms, and workforce system channels such as Virginia Workforce Connection. Apprenticeship job roles are often posted simply as entry-level or technician positions, limiting their visibility and preventing candidates from recognizing them as structured, earn-and-learn career pathways. Coordinated regional efforts to promote open apprenticeship positions, hiring cycles, and career entry points, when possible, could further strengthen engagement and participation.

For employers, messaging should emphasize apprenticeship as a strategic workforce solution, highlighting improved retention, reduced hiring costs, and the ability to shape a skilled workforce. Efforts must also increase awareness of available supports, including technical assistance from intermediary organizations, resources for related technical instruction delivery, and funding opportunities to offset program costs.

For educators and workforce partners, awareness should reinforce their role in supporting an employer-led system by aligning curriculum, advising, and work-based learning to industry-defined competencies. For adult job seekers, youth and their parents, apprenticeship must be elevated as a competitive, respected pathway that provides paid experience, industry credentials, and long-term earning potential without student debt.

Strengthen Youth Apprenticeship Pathways

Youth Registered Apprenticeship represents a strategic opportunity to strengthen the long-term workforce pipeline by introducing students to manufacturing and technical

careers earlier, while maintaining a strong employer-driven model. In Virginia, Youth Registered Apprentices are typically high school students engaged in Career and Technical Education (CTE) programs, creating a structured, school-based pathway, whereas nationally the model extends more broadly to individuals ages 16–24.

Increasing youth apprenticeship opportunities for high school juniors and seniors (ages 16+), through coordinated partnerships among workforce stakeholders and school divisions would add a scalable early entry point into manufacturing careers. Insights from the “See the Possible” Manufacturing Intensive in Charleston, SC reinforce that successful systems are built on strong cross-sector collaboration, sustained employer engagement, and clear alignment between secondary education, postsecondary training, and workforce needs, supported by effective intermediary coordination.

A key barrier to Youth Registered Apprenticeship expansion in Region 3 is that many manufacturing employers require employees and work-based learning participants to be at least 18 years old due to company safety and liability concerns, creating a gap for younger students. Addressing this challenge will require intentional pathway design, continued structured exposure and awareness opportunities and transitional experiences like internships and pre-apprenticeships that allow students to build skills and seamlessly progress into full apprenticeship upon reaching eligibility.

Establish Pre-Apprenticeship Pathways

Region 3 should prioritize the development of Pre-Apprenticeship programs as a critical feeder system into manufacturing and controlled environment agriculture Registered Apprenticeship. While pre-apprenticeship is often associated with youth exposure, it is equally valuable for adult learners and career changers who need foundational skills before entering a formal apprenticeship. These programs should be designed with direct employer input to ensure participants develop the technical competencies and employability skills required for success in the workplace. Pre-apprenticeship programs are connected to existing Registered Apprenticeship opportunities and could provide structured training in areas such as basic manufacturing skills, safety, math and measurement, and workplace readiness, addressing both the technical skill gaps and soft skill deficiencies identified by employers. By serving both youth and adults, pre-apprenticeships expand the available talent pool while creating a pipeline of candidates who are prepared and prioritized for full apprenticeship opportunities once eligible.

Advance Incumbent Worker Upskilling Through Apprenticeship

Registered Apprenticeship is also a powerful tool for incumbent worker development. Employers should leverage apprenticeship to upskill current employees into higher-skill, higher-wage roles such as maintenance technicians, automation specialists, and production supervisors. This approach strengthens retention, supports internal career advancement, and mitigates the impact of retirements and knowledge loss. Expanding apprenticeship for incumbent workers allows employers to build talent from within while addressing critical technical skill gaps.

Scale Existing Employer Programs

Region 3 should prioritize the expansion of existing Registered Apprenticeship programs as a high-impact strategy to strengthen its workforce pipelines. A growing number of regional employers have already established apprenticeship programs, creating a strong foundation to build upon. These employers should be supported and encouraged to expand their programs by developing additional occupation pathways across critical functions, including production, maintenance, automation, and other business operations. Broadening the scope of apprenticeship programs across departments, employers can create clear internal career pathways, support incumbent worker advancement, and ensure continuity in critical technical roles.

Increase Employer Participation in Work-Based Learning

Employers across GO Virginia Region 3 consistently emphasize the importance of increasing career awareness, strengthening early exposure, and expanding work-based learning (WBL) opportunities as critical components of a strong talent pipeline. While many employers recognize the value of WBL—including internships, apprenticeships, and career exploration activities—they often face barriers to participation, including limited time, capacity constraints, and uncertainty about how to engage in meaningful and manageable ways.

To address these challenges, Region 3 should pursue a dual strategy focused on expanding flexible engagement opportunities for employers and targeted investments and incentives to support participation at all levels of the workforce continuum.

Strategy 1: Expand Flexible, Short-Term Work-Based Learning Models

One of the most effective ways to increase employer participation is by offering flexible, low-barrier entry points into work-based learning. Short-term and scalable WBL models allow employers to engage with students without the long-term commitments required by internships or apprenticeship programs. These experiences are particularly valuable

for building early career awareness and interest while also laying the foundation for deeper engagement over time.

Key flexible WBL models include:

- *Career ChoICE Youth Expo*

The Career ChoICE Youth Expo is a large-scale, immersive career awareness and exploration experience that engages thousands of students annually across Region 3. Through interactive exhibits, hands-on demonstrations, and direct engagement with employers, students are introduced to a wide range of high-demand careers in advanced manufacturing, healthcare, skilled trades, and emerging sectors such as controlled environment agriculture.

Employers participate by showcasing equipment, demonstrating processes, and engaging students in experiential activities designed to spark interest and build understanding of career opportunities. Unlike traditional career fairs, the Expo emphasizes hands-on, interactive learning and early exposure—making it a critical entry point into the work-based learning continuum. It also allows employers to engage with a large volume of students in a single event, maximizing impact while minimizing individual time burden.

- *Sector-Focused Camps*

Short-term, hands-on programs aligned to high-demand industries that allow students to explore technical skills and career pathways through project-based learning and employer interaction.

- *Industry Tours*

Guided visits to employer facilities that expose students to modern production environments, technologies, and career opportunities. These tours play a critical role in shifting perceptions of manufacturing and related industries.

- *Guest Instruction*

Employer-led classroom engagement where industry professionals share real-world applications, career insights, and technical knowledge. This approach strengthens classroom relevance while allowing employers to engage without hosting students on-site.

- *Teamship®*

A project-based model where students work in teams to solve real-world challenges presented by employers, building employability skills while engaging directly with industry.

- *Job Shadowing*

Short, structured workplace visits that allow students to observe daily operations and interact with employees. These experiences require minimal employer time while providing meaningful exposure to careers and workplace expectations.

- *Micro-Internships*

Short, project-based work experiences that allow students to contribute to real employer needs over a limited timeframe. These experiences provide applied learning opportunities without requiring the structure of traditional internships.

Collectively, these flexible models provide employers with multiple ways to engage based on their capacity and readiness. They also create a continuum of engagement for students, ensuring sustained exposure and skill-building from middle school through high school and into postsecondary and workforce opportunities.

Strategy 2: Strategic Investment and Incentives for Work-Based Learning and Apprenticeship

Expanding work-based learning (WBL) and Registered Apprenticeship in Region 3 will require a comprehensive, coordinated investment strategy that supports the full continuum of career-connected learning experiences—from early awareness to intensive earn-and-learn models. This approach recognizes that while apprenticeship offers the highest level of engagement and impact, it also represents the most resource-intensive commitment for employers.

Strategic investments should prioritize a range of WBL opportunities, including:

- Career awareness and exploration activities (e.g., Career CholCE Youth Expo, industry tours)
- Job shadowing and short-term experiences
- Internships and micro-internships
- Pre-apprenticeship programs
- Registered Apprenticeship

Together, these experiences provide multiple entry points into advanced manufacturing and controlled environment agriculture careers and strengthen the overall talent pipeline.

For early-stage WBL experiences—such as career expos, job shadowing, and industry tours—funding is needed to support:

- Program coordination and logistics
- Employer recruitment and engagement
- Student transportation and participation
- Expansion across all localities

These upstream investments are critical to building awareness, generating interest, and preparing participants to enter more intensive training pathways. Strengthening these early touchpoints increases the number of individuals who ultimately pursue internships and apprenticeship opportunities.

At the same time, Registered Apprenticeship requires targeted, sustained financial support due to the higher costs incurred by employers. These costs include:

- Apprentice wages during training
- Related technical instruction
- Program development and registration
- Supervision and mentorship

Providing direct funding, tax incentives, and cost-sharing mechanisms is essential to reducing financial barriers and encouraging employers of all sizes to initiate and expand apprenticeship programs.

Equally important is investment in wraparound support services for participants across all WBL levels. Individuals particularly in Region 3's rural communities often face barriers such as:

- Transportation
- Childcare
- Tuition and training costs
- Tools and equipment

Addressing these barriers is essential to ensuring equitable access, increasing participation, and improving completion rates across internships, pre-apprenticeships, and apprenticeship programs.

In addition, sustained expansion of work-based learning depends on investment in the personnel, systems, and intermediaries that make these programs possible. Dedicated staff and organizational infrastructure are needed to:

- Engage and support employers
- Coordinate partnerships
- Align education and training providers with industry demand
- Manage programs and track outcomes

Intermediaries, such as the Institute for Advanced Learning and Research (IALR) and workforce system partners, play a critical role in reducing administrative burden, facilitating collaboration, and maintaining regional momentum. However, many of these efforts are currently supported through short-term grant funding. More stable funding models are needed to ensure continuity, scalability, and equitable access across all Region 3 localities.

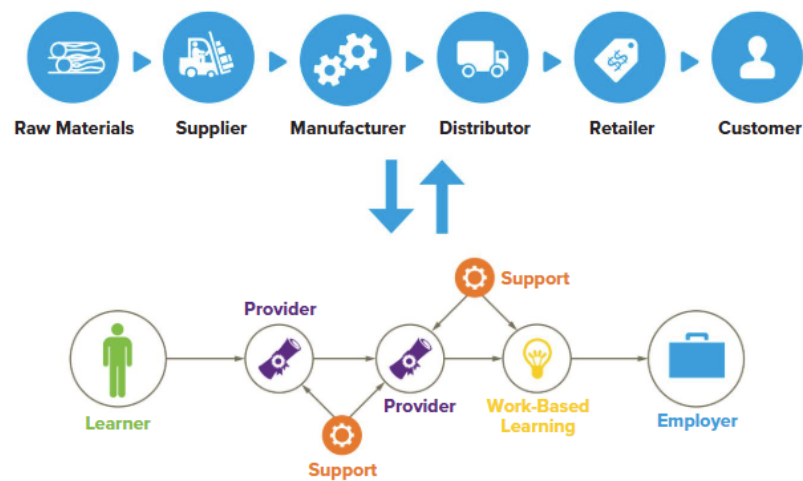
A balanced investment strategy that supports early exposure, career exploration, skill development, earn-and-learn models, and the systems that connect them, will be essential to building a sustainable, demand-driven work-based learning pipeline for the manufacturing and CEA sectors.

Appendix- A

U.S. Chamber Foundation's Talent Pipeline Management Academy

Region 3 and the Implementation Team partnered with the US Chamber of Commerce Foundation to offer the Talent Pipeline Management (TPM®) Academy. Created by the U.S. Chamber Foundation, the TPM Academy® trains business, workforce, economic development, and education leaders on the TPM framework, a demand-driven strategy to create career pathways for students and workers with talent pipelines aligned to dynamic business needs.

Figure 3: TPM as a Supply Chain Approach



Comprehensive End-to-End Talent Pipelines

TPM promotes a comprehensive approach to building talent pipelines based on a value stream map. The value stream map (Figure 4) includes the internal side of the talent pipeline—the upskilling of current employees—as well as the external side of the pipeline—involving new hires. Internal and external pipelines should be coordinated so that no matter where you start your TPM process you have an end-to-end approach for new hires and upskilled workers.

Figure 4: Value Stream Map



Taken from page 11 of the TPM Academy Curriculum

The Southern Virginia TPM Academy took place between April 29 & Aug. 5, 2025 with twenty-seven participants, representing thirteen employers (manufacturing and healthcare) and ten education, workforce, and economic development partners. Academy participants completed an Employer Collaborative Project, applying quantitative supply chain management principles to talent pipeline development and laying the foundation for an employer collaborative to support their industry. Below is the project presentation from a TPM group predominantly made up of manufacturing employers located in Halifax County.

PRESENTED BY

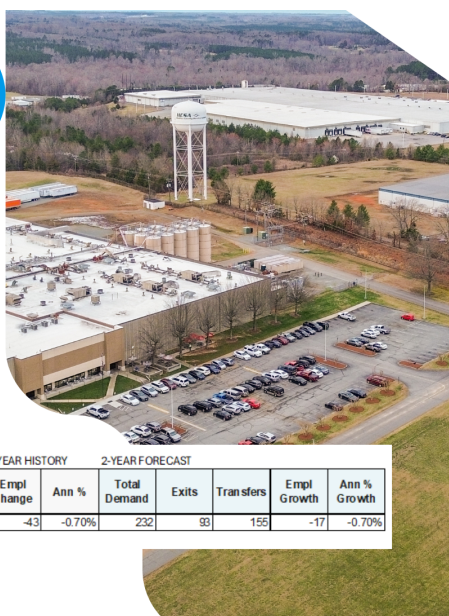
Rosa Dunn
 Explore The Trades
Danielle Potter
 Gloster Furniture
Rebecca Saunders
 Hitachi Energy
Mary Jo Stevens
 Huber Engineered Woods
Jessie Vernon
 IALR
Stacey Watson
 RTP Company



DEVELOPING STRATEGIES TO ATTRACT AND RETAIN ENTRY-LEVEL HOURLY WORKERS IN MANUFACTURING

BACKGROUND

The manufacturing sector faces significant challenges in attracting and retaining qualified entry-level workers, requiring innovative strategies and collaboration to ensure sustainable growth.



CURRENT					5-YEAR HISTORY				2-YEAR FORECAST					
SOC	Occupation	Empl	Mean Ann Wages ²	LQ	Unempl	Unempl Rate	Online Job Ads ³	Empl Change	Ann %	Total Demand	Exits	Transfers	Empl Growth	Ann % Growth
51-0000	Production Occupations	1,188	\$46,200	1.68	69	5.20%	13	-43	-0.70%	232	98	155	-17	-0.70%
*3rd highest of all occupations														

²3rd highest of all occupations

JobsEQ

FOCUS

Entry-level manufacturing candidates often lack the prerequisite skills for success in the field.

- Impacts:
- Recruitment
 - Retention
 - Production

2 YEAR TURNOVER

2023	Mean	23.25%
	Median	21.1%
2024	Mean	26.88%
	Median	26.40%



DEMAND

HIRES BY YEAR

2023	Mean	31
	Median	14.5
2024	Mean	36.5
	Median	26

PROJECTED TWO YEAR HIRES

Mean	67
Median	10

LMI SKILLS LISTS

Hard Skills

Skill Name	Active Job Ads
Manufacturing	36
Ability to Lift 41-50 lbs.	15
Welding	9
Lean Manufacturing	7
Microsoft Excel	7
Microsoft Office	7
Ability to Lift 51-100 lbs.	6
Forklifts	5
SAP	5
Transformers	5

Soft Skills

Skill Name	Active Job Ads
Communication (Verbal and written skills)	38
Organization	28
Cooperative/Team Player	26
Detail Oriented/Meticulous	18
Ability to Work in a Fast Paced Environment	16
Self-Motivated/Ability to Work Independently/Self Leadership	12
Supervision/Management	10
Work Ethic/Hard Working	10
Leadership	9
Coachable/Willingness to Learn	8



HIRING REQUIREMENTS

SKILLS & ABILITIES NEEDED FOR ALL HOURLY NEW HIRES

Technical Proficiency	Physical Endurance
Manual Dexterity	Adaptability
Attention to Detail	Housekeeping Standards
Communication Skills	Basic Math Skills
Problem Solving	Documentation Skills
Teamwork	

PARTNER DEMOGRAPHICS

% FEMALE

Mean 27%
Median 22%

% MINORITIES

Mean 40%
Median 42%

AVERAGE AGE

*For 5 companies only
43

% FEMALE

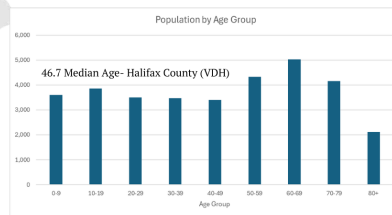
52.2% Halifax County (US Census Data)

% MINORITIES

38.5% Halifax County (US Census Data)

TALENT ANALYSIS

POPULATION BY AGE GROUP



WHATS THE IMPACT?

INDUSTRY & EDUCATION

**COLLABORATION
PARTNERSHIPS
TRAINING PROGRAMS**

INDUSTRY & COMMUNITY

**STABLE EMPLOYMENT
STRONGER ECONOMY**

BUSINESS IMPACT



**ENHANCED WORKPLACE
CULTURE & MORALE**

**INCREASED PRODUCTIVITY &
EFFICIENCY**

**REDUCED HIRING & TRAINING
COSTS**

**STRENGTHENED EMPLOYER
IMAGE IN THE COMMUNITY**

COMMUNITY IMPACT

**WORKFORCE DEVELOPMENT &
EDUCATION PARTNERSHIPS**

REDUCTION IN UNEMPLOYMENT

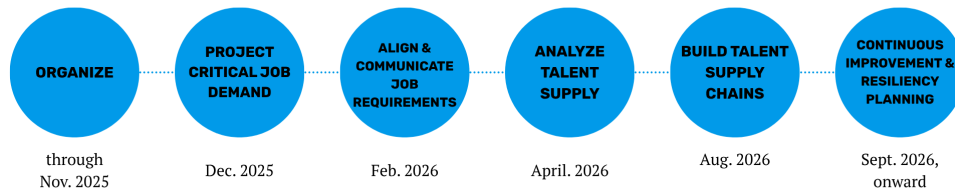
INCREASED QUALITY OF LIFE



MEASURING IMPACT- ROI

Workforce Readiness	Reduced onboarding/training time	20% reduction
Employee Retention	Lower turnover rate	6% improvement
Recruitment Efficiency	Reduced recruitment costs	\$3,000 per hire saved
Community Engagement	Enhanced brand reputation	
Innovation & Collaboration	Increased project success rate	15% more successful
Economic Development	Higher local employment rate	+4% in 2 years

TIMELINE FOR IMPLEMENTATION



SUSTAINABILITY PLAN

KEY REQUIREMENTS DRIVING PROJECT OUTCOMES

FIRST SET OF KEY REQUIREMENTS

- Clear communication of expectations
- Regular feedback from all stakeholders
- Timely adjustments to project plans

SECOND SET OF KEY REQUIREMENTS

- Comprehensive training for all employees
- Engagement with local community leaders
- Measurable outcomes for workforce initiatives





SUSTAINABILITY PLAN

TPM FINANCIAL STRUCTURE

REVENUE STREAMS

- Employer Contributions (tiered membership)
- State/Federal Grants (WIOA, EDA, USDA)
- Philanthropic Foundations
- Training Provider Fees (placement-based)
- In-kind Contributions (space, equipment, time)

BUDGET CATEGORIES

- Program Operations
- Training Support
- Tech/Data Systems
- Employer Engagement
- Outreach & Evaluation

FUND FLOW

All funds flow through the Chamber, which coordinates:

- Employers (define needs, fund training)
- Training Provider (deliver aligned programs)
- Job Seekers (receive training and placement)

PERFORMANCE-BASED

- Provider paid by outcomes
- Employers pay success bonuses



Contact Us



ENGINEERED
WOODS



HITACHI

Appendix- B

Registered Apprenticeship Occupation NAICS & SOC Code Mapping

To demonstrate how apprenticeship aligns with regional workforce demand, an analysis was conducted, mapping Registered Apprenticeship occupations to Standard Occupational Classification (SOC) and North American Industry Classification System (NAICS) codes. This crosswalk illustrates how apprenticeship programs directly correspond to occupations in manufacturing.

The analysis began with identifying relevant NAICS industry sectors aligned with Region 3's priority areas, particularly manufacturing and related advanced production industries. From there, USDOL-approved apprenticeship occupation titles were identified and aligned to their corresponding SOC codes to ensure consistency with federal labor market data. This approach allowed for a structured mapping of apprenticeship occupations to specific industries, highlighting where Registered Apprenticeship can most effectively support regional employer workforce needs. While many supportive roles such as administrative, transportation, logistics, and IT support positions (e.g., HR Generalist, Truck Driver, IT Support Technician) are also apprenticeable, they were not included in this mapping because the analysis focused specifically on production-aligned manufacturing occupations.

This mapping showed that the majority of apprenticeable occupations fall within:

- Manufacturing Production Occupations (SOC 51-xxxx)

Examples include CNC operators, welders, assemblers, and production technologists. roles essential to daily manufacturing operations and output.

- Installation, Maintenance, and Repair Occupations (SOC 49-xxxx)

Including industrial maintenance mechanics, electrical technicians, and automated equipment technicians, critical roles responsible for equipment reliability and uptime.

- Engineering and Technical Occupations (SOC 17-xxxx)

Such as robotics technicians, electromechanical technicians, and calibration specialists who support automation and advanced manufacturing systems.

These occupations align directly with NAICS 31–33 (Manufacturing)

Demonstrating Registered Apprenticeship Alignment with CEA

In addition to traditional manufacturing roles, the mapping also identifies apprenticeship occupations tied to:

- Biomanufacturing and Science-Based Roles (SOC 19-xxxx; NAICS 325)
- Advanced Manufacturing and Automation (NAICS 333, 334)

These roles support the technical systems that underpin controlled environment agriculture, including automation, environmental controls, and quality assurance processes

By aligning apprenticeship occupations with SOC and NAICS codes, this analysis demonstrates that Registered Apprenticeship:

- Directly targets high-demand occupations in Region 3's manufacturing sector
- Supports critical functions such as production, maintenance, and automation
- Bridges traditional manufacturing and emerging CEA systems, which rely on similar technical skill sets

Apprenticeship Program Occupation	O*NET- SOC CODE	NAICS Code
3D Printing Technician	17-3026.00	333, 334 (Advanced Manufacturing / Engineering Tech)
Aerospace Engineering Build Technician	17-3021.00	333, 334 (Advanced Manufacturing / Engineering Tech)
Aircraft Metals Tech (Machinist/CNC/Welder)	51-9161.00	31-33 (Production Manufacturing)
Aluminum Extrusion Die Technician	51-4061.00	31-33 (Production Manufacturing)
Aluminum Extrusion Press Operator	51-4021.00	31-33 (Production Manufacturing)
Assembler, Aircraft Powerplant	51-2031.00	31-33 (Production Manufacturing)
Assembler, Electromechanical	17-3024.00	333, 334 (Advanced Manufacturing / Engineering Tech)
Assembly Technician	49-2011.00	31-33 (Maintenance in Manufacturing)
Auger Press Oper, Man Controller	51-9041.00	31-33 (Production Manufacturing)

Auto-Maintenance-Equipment Servicer	49-9041.00	31-33 (Maintenance in Manufacturing)
Automated Access Systems Technician	49-9011.00	31-33 (Maintenance in Manufacturing)
Automated Equipment Engineer-Tech	49-9044.00	31-33 (Maintenance in Manufacturing)
Automatic-Equipment Technician	49-2022.00	31-33 (Maintenance in Manufacturing)
Avionics Technician	49-2094.00	31-33 (Maintenance in Manufacturing)
Baker (Bake Produce)	51-3011.00	31-33 (Production Manufacturing)
Batch-and-Furnace Operator	51-9051.00	31-33 (Production Manufacturing)
Bio-Manufacturing Technician (Downstream)	19-4021.00	325 (Chemical / Biomanufacturing)
Biomedical Equipment Technician	49-9062.00	31-33 (Maintenance in Manufacturing)
Boiler Operator	51-8021.00	31-33 (Production Manufacturing)
Building Maintenance Repairer (Ex. Title: Maintenance Repairer, Building)	49-9071.00	31-33 (Maintenance in Manufacturing)
CALIBRATION LABORATORY TECHNICIAN	17-3023.00	333, 334 (Advanced Manufacturing / Engineering Tech)
Calibration Technician	17-3028.00	333, 334 (Advanced Manufacturing / Engineering Tech)
CELL MAKER	51-9195.00	31-33 (Production Manufacturing)
CHEMICAL ENGINEERING TECHNICIAN	19-4031.00	325 (Chemical / Biomanufacturing)
CHEMICAL OPERATOR III	51-9011.00	31-33 (Production Manufacturing)
Civil Engineering Technician	17-3022.00	333, 334 (Advanced Manufacturing / Engineering Tech)
CLARIFYING-PLANT OPERATOR (Text)	51-8031.00	31-33 (Production Manufacturing)
CNC OPERATOR - MILLING	51-4035.00	31-33 (Production Manufacturing)

CNC OPERATOR - MILLING AND TURNING	51-4034.00	31-33 (Production Manufacturing)
CNC Operator and Programmer	51-9162.00	31-33 (Production Manufacturing)
COATING MACHINE OPERATOR I	51-9124.00	31-33 (Production Manufacturing)
COMPOSITE FITTER MECHANIC	51-2051.00	31-33 (Production Manufacturing)
CONTOUR WIRE SPECIALTY DENTURE	51-9081.00	31-33 (Production Manufacturing)
COREMAKER	51-4071.00	31-33 (Production Manufacturing)
DESIGN & PATTERNMAKER SHOE	51-6092.00	31-33 (Production Manufacturing)
DIE FINISHER	51-4111.00	31-33 (Production Manufacturing)
DIE SETTER (Forging)	51-4022.00	31-33 (Production Manufacturing)
Electrician Maintenance / Production Machinery Electrician	47-2111.00	31-33 (Maintenance in Manufacturing)
FABRIC WORKER (Existing Title: Patternmaker, All-Around)	51-4062.00	31-33 (Production Manufacturing)
FABRICATOR-ASSEMBLER METAL PROD	51-2041.00	31-33 (Production Manufacturing)
FOUR-SLIDE-MACHINE SETTER	51-4081.00	31-33 (Production Manufacturing)
FREEZER OPERATOR (Dairy)	51-9193.00	31-33 (Production Manufacturing)
FURNITURE FINISHER	51-7021.00	31-33 (Production Manufacturing)
GANG SAWYER, STONE	51-9032.00	31-33 (Production Manufacturing)
GRINDER I (Clock & Watch)	51-4033.00	31-33 (Production Manufacturing)
Industrial Maintenance Mechanic)	49-9041.00	31-33 (Production Manufacturing)
Industrial Production Supervisor	11.3013.00	31-33 (Production Manufacturing)
Industrial Sewing Machine Operator	51-6031.00	31-33 (Production Manufacturing)

Instrumentation Technician	17-3023.00	333, 334 (Advanced Manufacturing / Engineering Tech)
Jig Builder (Wood Contain)	51-7031.00	31-33 (Production Manufacturing)
LABORATORY ASSISTANT	19-4042.00	325 (Chemical / Biomanufacturing)
LABORATORY ASST, METALLURGICAL	17-3029.00	333, 334 (Advanced Manufacturing / Engineering Tech)
LAY-OUT WORKER I (Any Ind)	51-4192.00	31-33 (Production Manufacturing)
LEAD BURNER	51-4121.00	31-33 (Production Manufacturing)
LOAD DISPATCHER	51-8012.00	31-33 (Production Manufacturing)
MACHINE FIXER (Textile)	51-6064.00	31-33 (Production Manufacturing)
MACHINE SETTER (Woodwork)	51-7042.00	31-33 (Production Manufacturing)
Microelectronics Technician	17-3026.01	333, 334 (Advanced Manufacturing / Engineering Tech)
Non-Destructive Tester	17-3029.01	333, 334 (Advanced Manufacturing / Engineering Tech)
Optics Manufacturing Technician	17-3029.08	333, 334 (Advanced Manufacturing / Engineering Tech)
PATTERNMAKER, WOOD	51-7032.00	31-33 (Production Manufacturing)
PLANT OPERATOR, FURNACE PRO	51-8091.00	31-33 (Production Manufacturing)
Precision Agriculture Technicians	19-4012.01	325 (Chemical / Biomanufacturing)
PRECISION ASSEMBLER, BENCH	51-2023.00	31-33 (Production Manufacturing)
PRESS OPERATOR HEAVY DUTY	51-4031.00	31-33 (Production Manufacturing)
Production Technologist	51-2092.00	31-33 (Production Manufacturing)
Quality Control Analyst	19-4099.01	325 (Chemical / Biomanufacturing)
Robotics Technician	17-3024.01	333, 334 (Advanced Manufacturing / Engineering Tech)

ROLL OPERATOR I	51-4023.00	31-33 (Production Manufacturing)
Semiconductor Processing Technician (NOF)	51-9141.00	31-33 (Production Manufacturing)
Welding Machine Operator, Arc	51-4122.00	31-33 (Production Manufacturing)

Appendix- C

Youth Apprenticeship Best Practice Visit: “Building Pathways: Manufacturing Intensive” hosted by the Partnership to Advanced Youth Apprenticeship (PAYA)

In October 2025, the Institute for Advanced Learning and Research (IALR) hosted a regional cohort to participate in the “Building Pathways: Manufacturing Intensive” convening in Charleston, South Carolina, organized by the Partnership to Advance Youth Apprenticeship (PAYA). This best-practices visit was designed to expose Region 3 stakeholders to successful youth apprenticeship models in manufacturing.

The cohort included representatives from a local employer, K–12 school division, and community college, reflecting the cross-sector collaboration required to build a sustainable apprenticeship system. Over two days, participants engaged in structured sessions, peer learning, and site visits highlighting how apprenticeship is implemented at scale.

The convening provided a comprehensive look at apprenticeship system design, beginning with an overview of the Charleston Regional Youth Apprenticeship (CRYA) model at Trident Technical College, including its history, growth, and outcomes in manufacturing pathways. Several sessions emphasized the power of partnerships, featuring K–12, postsecondary, and workforce leaders who demonstrated how coordinated efforts across institutions support successful program implementation. Additional workshops focused on practical strategies for:

- Engaging and recruiting employers
- Securing employer commitment to apprenticeship programs
- Strengthening on-the-job training through effective mentorship and supervision

A fireside chat with former apprentices offered firsthand perspectives on program impact, reinforcing the value of apprenticeship as a competitive and viable career pathway. Participants also explored hands-on training environments during a tour of Trident Technical College’s labs, where educators, employers, and apprentices discussed program delivery and skill development in real time.

Day two sessions addressed common barriers to youth apprenticeship, including insurance, regulatory considerations, and employer concerns about hiring young workers, along with strategies to overcome them. Additional presentations highlighted successful regional models from across the country, with a focus on student recruitment, retention, and long-term success.

The visit concluded with a site tour of the Mercedes-Benz Sprinter manufacturing plant, demonstrating the power of public private partnerships.

Key Takeaways

The experience reinforced several critical components for expanding youth apprenticeship in Region 3:

1. Collaboration is Essential

Successful apprenticeship systems are built on strong partnerships with shared ownership of workforce outcomes.

2. Strategic Messaging Drives Participation

Effective programs position apprenticeship as a high-quality career pathway by:

- Clearly communicating career outcomes, wages, and advancement opportunities to youth and their parents
- Leveraging testimonials from current and former apprentices to strengthen recruitment

3. Sustained Employer Engagement is Critical

Employers are actively involved in program design, training, and mentorship, ensuring alignment with real workforce needs.

4. Intermediary Support Strengthens Implementation

Intermediary organizations help coordinate across stakeholders, reduce administrative burden, and support program scalability.

The PAYA Manufacturing Intensive provided a clear, real-world example of how a coordinated apprenticeship system can support manufacturing workforce development.

Appendix- D

Manufacturing Employer Qualitative Workforce Survey

SURVEY QUESTIONS

1. Which roles (positions/occupations) are most critical to your production and operations?
2. Which roles (positions/occupations) are most difficult to fill? (may or may not be the same as those listed in question 1)
3. What makes it challenging to find qualified candidates for these roles (listed in question 2)?
4. What specific technical or "hard" skills are most vital to your operations? (Please include specific certifications, if applicable.)
5. Please rank the value of the following credentials to your organization:
 - a. Industry Recognized Credentials
 - b. Company Specific Training
 - c. Formal Degrees
6. Beyond technical expertise, what employability or "soft" skills are most important to your organization?
7. When you struggle to fill a position, is it typically due to a lack of technical ("hard") skills or a lack of employability ("soft") skills? Please elaborate.
8. How do you anticipate your workforce needs to change in the next 1–5 years? How might technology or industry changes impact staffing needs? What roles may need to be created, expanded or phased out?
9. What would you say is the single largest workforce challenge your company is currently facing?
10. What recommendations do you have for improving the manufacturing talent pipeline in our region?
11. What types of workforce support would be most valuable to your company?
12. Is there additional feedback or information you'd like to provide the team regarding current workforce needs and challenges?

Key Findings

Findings from regional manufacturing employers highlight a workforce system under increasing strain due to skills gaps, workforce readiness challenges, and structural barriers. The data reveals critical issues across hiring, training, and long-term talent pipeline sustainability.

1. Critical Roles

Frontline production roles, including operators, associates, and machine operators, are the foundation of manufacturing operations. These roles are supported by skilled trades, supervisory staff, logistics personnel, and professional roles, all of which are essential to maintaining efficiency and long-term growth.

2. Hard-to-Fill Positions

According to survey respondents, the most difficult roles to fill are skilled trades and technical positions, such as maintenance technicians, controls specialists, electricians, and engineers. Employers also report challenges sustaining a pipeline of entry-level production workers.

This reflects a dual shortage of both high-skill technical talent and foundational workforce roles.

3. Barriers to Hiring

Employers identified multiple, overlapping barriers:

- Skills and experience gaps (most significant)
- Limited labor pool and rural location challenges
- Aging workforce and declining interest in trades
- Workforce readiness issues (work ethic, reliability)
- Job factors (pay, schedule, working conditions)

Hiring challenges are driven by a combination of workforce, demographic, and regional factors.

4. Critical Skills

- Technical: Industrial maintenance, electrical, mechanical systems, and equipment operation
- Foundational: Math, measurement, and basic manufacturing skills
- Emerging: Automation, PLCs, and digital/technical systems

Demand is increasing for advanced technical and technology-enabled skills.

5. Credentials & Training

Employers place the highest value on:

- Industry-recognized certifications
- Company-specific training

Formal degrees remain relevant but are considered less critical than hands-on skills and applied learning.

6. Soft Skills

Top employability skills include:

- Problem solving (most cited)
- Collaboration and communication
- Adaptability and willingness to learn
- Reliability and work ethic

Employers emphasize that soft skills are as important as technical skills.

7. Workforce Gaps

Workforce challenges stem from both:

- Technical skill shortages, and
- Soft skill gaps, particularly in reliability and professionalism

Effective solutions must address both competency and workforce readiness.

8. Future Workforce Trends

- Increased automation and technology adoption
- Greater demand for skilled technical workers

- Decline in low-skill roles
- Risk of knowledge loss due to retirements

Employers must focus on upskilling, cross-training, and knowledge transfer.

9. Top Workforce Challenges

- Workforce readiness and work ethic
- Difficulty finding qualified candidates
- Training and skill development gaps
- Retention and turnover

Challenges extend beyond hiring to include retention and workforce quality.

Recommendations from Employers

To strengthen the talent pipeline, employers recommend:

- Expanding STEM and Career & Technical Education (CTE) programs
- Increasing career awareness and early exposure
- Enhancing work-based learning (internships, apprenticeships)
- Strengthening education–industry partnerships
- Improving regional quality of place (transportation, childcare, amenities)

Workforce Supports Needed

Employers identified the greatest need for:

- Credentialing and certification programs
- Customized training and work-based learning opportunities
- Recruitment assistance and access to new talent pools
- Financial support for training and certification costs
- Stronger connections with K–12 and postsecondary institutions

