



**Addressing Unmet Demand:
A Replicable Playbook
And Asset Map**



December 2021

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EXECUTIVE SUMMARY

In late 2020, The State Council of Higher Education for Virginia (SCHEV) was awarded a [Recovery Incubator Grant](#) by Strada Education Network (Strada). SCHEV's grant proposal included three deliverables and engaged several key partners: The Virginia Community College System (VCCS), Virginia Economic Development Partnership (VEDP), Virginia Secretary of Labor, Growth and Opportunity Virginia (GO Virginia) and the Virginia Employment Commission (VEC).

This specific grant deliverable, a replicable playbook and asset map, serves as a resource for other regions and states to identify occupational shortages and implement successful efforts for addressing them. This document is a "how-to" guide for other regions or states to follow. While this document does not offer a playbook that is solely solution-focused, it does raise topics that regions and states should consider when addressing such shortages (unmet demand).

The unmet demand calculations, for purposes of this project, did not reveal any significant occupational shortages. On the other hand, the barriers and assets related to addressing shortages are acute and impact the three sectors for this project: Construction (infrastructure), healthcare and manufacturing. Barriers include existing processes and policies, program implementation and operating costs as well as data limitations.

Despite the barriers, an opportunity exists to address labor market shortages through higher education academic programs and will require formation of a new learning ecosystem. The assets identified for a new learning ecosystem include:

- Flexible funding for innovation
- Reimagined classrooms/learning spaces
- Coordinated statewide solutions with regional roles
- Re-engineered approaches to workforce training
- Innovative, symbiotic public-private partnerships

The Commonwealth of Virginia stands poised to foster a new learning ecosystem through ongoing collaboration between higher education, economic development and workforce development at the state and regional levels. The activities and support from this Strada Recovery Incubator grant provide a boost toward this forward-minded, comprehensive approach.

INTRODUCTION AND PURPOSE

Introduction

In late 2020, The State Council of Higher Education for Virginia (SCHEV) was awarded a \$250,000 [Recovery Incubator Grant](#) by Strada Education Network (Strada). SCHEV's grant proposal included several key partners: The Virginia Community College System (VCCS), Virginia Economic Development Partnership (VEDP), Virginia's Secretary of Labor, Growth and Opportunity Virginia (GO Virginia) and the Virginia Employment Commission (VEC).

To provide further state context, SCHEV serves as Virginia's coordinating body for higher education. Some of SCHEV's duties include: higher education budget and policy recommendations, new academic program approvals and administration of state financial aid programs. VCCS's duties include, but are not limited to, approving appropriate and high-quality academic and workforce offerings and serving as an advocate for the community college system.

VEDP is the state's economic development entity whose charge includes business retention, expansion and recruitment efforts as well as international trade. GO Virginia is a state initiative including nine regions that supports place-based economic and workforce development and diversification. The VEC's three main objectives are to alleviate hardship for unemployed Virginians, prevent unemployment and promote reemployment of Virginians. VEC also provides workforce information.

Strada's Recovery Incubator Grant program focuses on two interrelated topics: near-term COVID-19 workforce recovery and a longer-term framework for analyzing real-time labor market and education data for actionable insights by students, higher education, policy-makers and employers. The workforce recovery topic sheds further light on rethinking the learning ecosystem with multiple on- and off-ramps throughout a person's life and career. It also highlights the job security and economic mobility challenges of those with no formal degree or credential, which the pandemic amplified. The latter – the longer-term framework – dovetailed with the summer 2020 release of SCHEV's [workforce and higher education alignment report](#) which included a similar framework as part of its recommendations and further supports a reimagined learning ecosystem.

SCHEV and partners, having been engaged in both COVID recovery workgroups, as well as the higher education and workforce alignment project, submitted a successful proposal with the intention to provide three key deliverables summarized below. The deliverables address the near-term and longer-term needs and support a new learning ecosystem.

Deliverable 1: Develop a workforce analytics office. Using the framework set forth in the alignment report, work to implement a workforce analytics office. The office will analyze and translate labor market and education data for actionable insights for student consideration of program selection; development and assessment of higher education academic programs; policy and funding decisions by policy makers; and identification of current and future workforce needs of employers. The deliverable includes implementation planning efforts to form and stand up such an office. VEDP is leading this effort with the newly created Office of Education Economics.

Deliverable 2: Develop visual career pathways maps for VCCS students that relate to on- and off-ramps within the learning ecosystem and are regionally specific. The two regions of focus exemplify rural and urban regions within Virginia. VCCS regions of focus include: Southside Virginia Community College (SVCC), a rural region, and the Community College Workforce Alliance (CCWA) which encompasses a region that is part urban, suburban and rural. VCCS is leading this activity with CCWA and SVCC. Three industries of focus for the career pathways maps include: construction (infrastructure), healthcare and manufacturing sectors. All three sectors are key industries in both community college service areas.

Deliverable 3: Create a step-by-step playbook for assessing unmet demand in a region, including assets that can successfully address it. Deliverable 3, led by SCHEV, is the focal point of this report.

VEDP, VCCS and SCHEV are responsible for their respective deliverables. SCHEV is also managing the grant funds, progress and final report submission. In addition to any teams engaged for a specific deliverable, the project also includes formation of a cross-system leadership team. This team includes executive-level representation from SCHEV, VEDP, VCCS, VEC, GO Virginia and the Virginia Secretary of Labor. The team met three times to provide input on all three deliverables: at the beginning, midpoint and end of the work.

Purpose

The replicable playbook and asset map serve as tools for other regions and states to identify occupational shortages and implement successful efforts to address those shortages. This document is written as a “how-to” guide for other regions to follow for their own uses. While this document does not offer a playbook that is solely solution-focused, it does raise topics that regions and states should consider when addressing such shortages.

REPLICABLE PLAYBOOK: THE PROCESS

The playbook and asset map complement VCCS's career pathways maps, which, in conjunction with student advising, can bolster enrollment in programs. The increased enrollment and subsequent completion, in turn, support the labor market pipeline for occupations including those that may have shortages (unmet demand).

Regional Selection

A decision was made early in grant implementation to include rural and urban regions representative of Virginia. Consideration was initially given to GO Virginia regions, but those do not completely align with the community college service areas used for VCCS' career pathways maps. Therefore, the regions of focus initially included the Rappahannock Community College (RCC) and the Community College Workforce Alliance services areas. However, during the summer and due to unforeseen circumstances, RCC had to withdraw. SVCC took its place.

Data within this report comes from VEC, Bureau of Labor Statistics and EMSI data – Q3 2021.

SVCC Regional Characteristics

The SVCC footprint includes the city of Emporia and the counties of Brunswick, Buckingham, Charlotte, Cumberland, Greensville, Halifax, Lunenburg, Mecklenburg, Nottaway and Prince Edward. The rural region is generally located in central, southern Virginia adjacent to the North Carolina border.

With a population of 186,240, the region experienced a 2% contraction since 2015 but is projected to grow by almost a 1,000 over the next four years. The region's population is diverse; it is also older and includes more veterans than the national average for an area of its size.

Regarding educational attainment, 10.5% of the region's residents possess a bachelor's degree. The national average is 20%. While 8% have an associate degree, the national average is ~9%. The largest percentage of the region's population, 36.5%, includes those with only a high school diploma.

In terms of the postsecondary educational pipeline: Longwood University (public four-year), Hampden-Sydney (private four-year) and Southside Virginia Community College produced 2,210 graduates in 2020. The collective pipeline of these institutions shrunk almost 20% since 2015.

Of the 186,240 population, 72,945 are employed in the labor force. Average earnings per job in the region are \$48,400 which is \$25,700 below the national average.

The region's largest industries include state government (a state correctional facility); local government (including education and hospitals); and eating establishments. The top growing industries include education, business management, retail and infrastructure/utilities.

Of the more than 5,972 companies in the region, more than half posted job openings in the last 12 months. The top 10 companies in the region that posted jobs primarily represent the distribution/logistics, retail and government sectors.

The majority of the 5,972 employers individually employ fewer than 20 employees. The biggest takeaway from the data is that in such a rural region, each occupational shortage matters and the sum of each individual occupational shortage has significant impact on the region's economy. The shortages matter to individual businesses, many of which are small in size and can have profound impact on the business' success and sustainability which in turn impacts the region's economy.

CCWA Region Characteristics

The CCWA footprint includes the cities of Colonial Heights, Hopewell, Petersburg and Richmond and the counties of Amelia, Charles City, Chesterfield, Dinwiddie, Goochland, Hanover, Henrico, New Kent, Powhatan, Prince George, Surry and Sussex. The region possesses a mix of urban centers including the capital of Virginia, adjacent suburban localities and on the perimeter of those, distinctly rural communities. The region connects Piedmont/central Virginia to the Hampton Roads region.

The CCWA region encompasses a population of 1,285,271 with ~4% growth over the past five years and 5% growth over the next five years. The region's population is reflective of other areas across the nation of similar size in terms of age, diversity and veteran status of residents.

Regarding educational attainment, 23.7% of the region's residents possess a bachelor's degree. The national average is ~20%. While 7.5% have an associate degree, the national average is ~9%. The largest percentage of the region's population, 24.6%, includes those with only a high school diploma.

In 2020, 14,362 students graduated from 10 institutions in the region, a collective decline of 7% over the past five years. The bulk of those graduates came from four institutions: Virginia

Commonwealth University, University of Richmond, John Tyler Community College and Reynolds Community College.

Public four-year institutions include: Virginia Commonwealth University (50% of graduates) and Virginia State University (an HBCU). Richard Bland College is a two-year branch of the College of William & Mary. Private four-year institutions include: non-profit University of Richmond, Randolph-Macon College, Virginia Union University (HBCU), as well as for-profit Fortis College and South University-Richmond.

John Tyler Community College and Reynolds Community College formed a partnership, the Community College Workforce Alliance (CCWA), which serves as the namesake for this region. CCWA is the region's major workforce development entity - serving employers, workers and students and connecting them with resources from the two community college partners while also customizing programs and training to meet specific employer needs.

Of the 1.28M population, 599,396 are employed in the labor force. Average earnings per job in the region are \$69,600 which is \$4,500 below the national average.

The region's top industries include eating establishments; local government (education and hospitals); and state government. The top growing industries include transportation/warehousing, construction and professional/scientific/technical services.

More than 33,000 companies operate in the region and almost half posted job openings in the last 12 months. The top 10 companies in the region that posted jobs represent a mix of finance/insurance, healthcare, government, education and tech sectors.

Roughly a third of regional employers have fewer than five employees. In those instances, occupational shortages can impact severely a business' short-term bottom line and longer-term growth. The advantage in the region is that with a larger population there is a wider labor pool to draw from. However, as the region continues to grow and the higher education pipeline continues to contract, unmet demand will increase and impact more occupations and industries.

Industries of Focus

The industries of focus for this replicable playbook align with those for the visual career pathways map deliverable. The industries were selected by VCCS, CCWA and RCC/SVCC for two predominant reasons. First, participating community colleges offer various programs

and credentials in support of the industries. Second, the industries are targeted within both regions based on: existing physical and human capital assets; a major regional employment base; and/or potential sectors of growth within the region. The following provides relevant insight on each of the three selected sectors: Construction (infrastructure-related), healthcare and manufacturing industries.

Construction (infrastructure-related): The selection of this industry sector stems in large part from imminent federal legislation and funding to improve the nation’s infrastructure: Roads, bridges, airports, water/sewer, power grid and lines and broadband. Passage and implementation of the infrastructure bill would result in the demand for additional workers and also will provide states with the resources to grow that workforce pipeline. Additionally, VEDP identifies [off-shore wind](#) and [supply chain management](#) as target sectors that relate to the construction/infrastructure industry. The largest existing employers within this sector focus on home building.

Major regional employers

SVCC	CCWA
Georgia-Pacific	VSC Fire & Security Corp.
Virginia Marble Manufacturers	Woodfin Oil
American Buildings Co.	Falconer Construction
Toll Integrated Systems	Atlantic Constructors
Comfort Systems Mid-Atlantic	Schindler Elevator Corp.

Healthcare: This sector was selected for several reasons. First, quality, accessible healthcare is a significant contributor to a region’s quality of life. As such, it is also a significant factor for economic development: the retention, expansion and attraction of other industries. Finally, the pandemic has exacerbated the strain and burnout of healthcare workers which can be amplified particularly in rural areas where health care is not as accessible.

Major regional employers

SVCC	CCWA
Halifax Home Health & Hospice	VCU Medical Center
Sentara Halifax Regional Hospital	Chippenham Hospital
Centra Southside Community Hospital	Henrico Doctor’s Hospital
Piedmont Geriatric Hospital	St. Mary’s Hospital
Geo Group- Lawrenceville Correctional Center	Southside Regional Medical Center

Manufacturing: The following manufacturing sectors are identified as statewide industry targets according to [VEDP](#): Advanced materials, aerospace, automotive and wood products. The broad “Lifesciences” is another statewide target industry which includes biotech and pharmaceutical manufacturing. SVCC’s major manufacturing employers include plastics, automotive fabric and fiber manufacturing. CCWA’s major manufacturing employers include food and food equipment, advanced materials, defense and tobacco.

Major regional employers

SVCC	CCWA
Presto Products Co.	The CF Sauer Company
Reynolds Products	Hillphoenix
Global Safety Textile	Du Pont Tejjin Films
Reiss Manufacturing	US Defense Supply Center Richmond
Aquatic Company	Swedish Match North America

Unmet Demand Methodology: A Step-by-Step

The following step-by-step process for determining unmet demand in a region warrants a preface. Unmet demand can be calculated in a variety of ways, using various data sources and including an array of factors or inputs. The relationship between occupations and academic programs is “many to many” and thus creates an imperfect and complex assessment. Therefore both quantitative and qualitative inputs are critical to understanding the “full picture.” The process summarized here is a basic method that those not engaged in daily education and labor market data analysis can perform.

The process also reinforces the need for a statewide workforce analytics office such as the Virginia Office of Education Economics (VOEE). A statewide entity exclusively focused on developing a sound and vigorous methodology for a variety of industry sectors will enable consistent and routine analysis and translation for action. It will help prevent mixed messages to policy makers or other stakeholders that results from inconsistent methods; VOEE will provide the “go to” unmet demand analysis for various stakeholders to use. VOEE’s data, analysis and translation will help stakeholders identify needs and solutions to address those needs. Such an office helps ensure data and analysis accuracy and efficiency.



Calculating Unmet Demand: Broad Considerations

- Identify the area of focus. Will statewide, regional or local areas be examined? As states include a variety of communities and industries, often a regional analysis offers more nuance and insight than statewide analysis alone. On the other hand, a community-specific analysis could be too small to warrant meaningful analysis or elucidate significant findings. Regional and state analyses tend to be the preferred levels of focus. Performing both often can be insightful. In this case, because Virginia includes a mix of urban and rural regions, two different regions were selected to reflect the dichotomy that exists in Virginia for comparison purposes and to be truly reflective of Virginia’s geographic fabric.
- Identify industries of focus based on the chosen regions. Industries selected for statewide analysis may be different than a regional assessment. For the purposes of this project, the regional selection informed the industry selection. There was agreement early on by the grant partners and specifically VCCS and regional partners – SVCC and CCWA (also serving as regional workforce development partners) to overlap key industries: construction (infrastructure), healthcare and manufacturing. Refer to the previous section for further context on the sectors selected for both regions.
- Identify the labor market and education data sources that will be used to calculate unmet demand. Sources can include public data via the Bureau of Labor Statistics (BLS) or state occupational projections pulled by the state employment commission. Conversely, private data sources (e.g., EMSI/Burning Glass and JobsEQ) pull publicly available data and incorporate additional algorithms for a “click and go” type of analysis.

While this offers efficiency and ease of use, automating a standard-occupational-code (SOC) to classification-of-instructional-code (CIP) crosswalk (SOC to CIP crosswalk), its proprietary processes and algorithms cannot be replicated outside of the platform use. **For purposes of this project, EMSI was used; it is a platform used by VCCS, CCWA and SVCC.**

Calculating Unmet Demand: Replicable Steps Using EMSI

- Using EMSI, select the “Occupational Reports” tool or go to the occupation tab and select occupation table.
- Under the section labeled “Select Occupations,” select using the “Browse” by 5-digit standard occupational codes for the selected industries. For construction, the 5-digit SOC for construction and extraction occupations (47-XXXX) was used. For healthcare the 5-digit SOC codes for “healthcare practitioners and technicians” (29-XXXX) and “healthcare support occupations” (31-XXXX) were selected.

For manufacturing, the list of SOC codes that VEDP uses for manufacturing were selected. Refer to the table below.

VDEP SOC Manufacturing Codes

11-3051	51-3023	51-4062	51-6031	51-7041	51-9031	51-9192
17-2112	51-3091	51-4071	51-6041	51-7042	51-9032	51-9193
17-3026	51-3092	51-4072	51-6042	51-7099	51-9041	51-9194
49-9041	51-3093	51-4081	51-6051	51-8011	51-9051	51-9195
49-9043	51-3099	51-4111	51-6052	51-8012	51-9061	51-9196
51-1011	51-4021	51-4121	51-6061	51-8013	51-9071	51-9197
51-2011	51-4022	51-4122	51-6063	51-8021	51-9081	51-9198
51-2021	51-4023	51-4191	51-6064	51-8031	51-9082	51-9199
51-2028	51-4031	51-4192	51-6091	51-8091	51-9083	
51-2031	51-4032	51-4193	51-6091	51-8092	51-9111	
51-2041	51-4033	51-4194	51-6092	51-8093	51-9123	
51-2051	51-4034	51-4199	51-6093	51-8099	51-9124	
51-2061	51-4035	51-5111	51-6099	51-9011	51-9141	
51-2098	51-4041	51-5112	51-7011	51-9012	51-9151	
51-3011	51-4051	51-5113	51-7021	51-9021	51-9161	
51-3021	51-4052	51-6011	51-7031	51-9022	51-9162	
51-3022	51-4061	51-6021	51-7032	51-9023	51-9191	

- Select the three created groups after returning to “Limit by occupation.”
- Use the prompt to select a region. Either use a pre-configured region or select each city or county within a regional footprint to create a custom region. Save each region as a group for future downloads. The CCWA service area and SVCC service

area were used for this report; this process was performed separately for each region.

- Under “Select the data you would like to display,” click “Custom data selection.”
 - Jobs: Current Year, Start Year
 - Hires: Current Year
 - Separations: Current Year
 - Change: Jobs Change, % Change
 - Openings: Total Openings, Average Annual Openings, Total Replacement Jobs
 - Annual Earnings: Median Annual Earnings
 - Automation Index
 - Education: Typical Entry Level Education, Work Experience Required, Typical On-the Job Training
 - Regional Completions: 2020 Regional Completions
- Click “Run” button.
- For this specific report’s selected regions and industries, 241 occupations at the 5-digit SOC level are listed.
- On the new page that opens, update the timeframe to a 10-year window.
- Click “Export” and save file accordingly.
- Using the spreadsheet data, calculate the unmet demand using the following formula:
- **Unmet Demand = ((2021 – 2031 Change in Jobs)/10) – Regional Completions**
- Add the following analysis to downloaded Excel workbooks.
 - Open workbook to Occupations tab. Unmerge all cells.
 - Add column at far right for unmet demand.
 - Add formula to first cell in new column: = (E2/10)-T2
 - Where column E = 2031-2021 change in jobs
 - Where column T = Regional completions of most recent year (2020)
- Highlight in green, those occupations with unmet demand (column V) equal to or greater than “1.” Note: an unmet demand of “1” does not imply a shortage.

- Select the entire table, copy and paste into a new worksheet labeled “final unmet demand list.”
- In the new tab/“final list” delete those occupations with values less than “1” in column V (unmet demand column).

Calculating Unmet Demand: Additional Screening Criteria

Education

The cross-system leadership team recommended an education screen to eliminate those occupations with unmet demand that require no post-secondary education, degree or credential. Often these are the occupations with the greatest unmet demand (e.g., home health aides). However, other factors tend to be at play contributing to the unmet demand for those occupations such as wages and working conditions.

On the opposite end of the spectrum, those occupations with unmet demand that require a bachelor’s degree or higher often are highly mobile. In other words, graduates with bachelor’s degrees and beyond tend to move where the jobs are versus stay within the region where they went to college/graduate school/medical school. For this reason – mobility – occupations with unmet demand and that require a bachelor’s, graduate or professional degree were removed from this list. Once again, many of these occupations had shortages which need to be addressed at the national and state levels.

The above are translated into the spreadsheet steps below:

- Using the same “final unmet demand list” sort by typical entry-level education (Column Q).
- Delete those occupations (rows) requiring no degree or credential.
- Delete those occupations (rows) requiring a bachelor’s degree or greater.

Wages

The cross-system leadership team also advised for a wage screen to eliminate those occupations that do not pay a living wage. The team identified [MIT’s living wage calculator](#) as a good resource for determining living wage.

Steps for the wage screen using the living wage calculator and applying to the list of occupations with unmet demand:

- Use the resultant worksheet (list) from the education screen.

- Sort median annual earnings (Column L) least to greatest earnings.
- Access MIT’s living wage calculator. Select the state and localities of interest. In this case, Virginia, and then each of the localities comprising the SVCC and CCWA service areas. Living wages were calculated for each locality and region separately based on one adult’s earnings.
- Add a new worksheet to the workbook and label as “living wage criteria and calculations.” List each locality in the region and copy over the living wages for each locality generated from MIT’s tool. Using the appropriate Excel formula, calculate the median wage for the region (list of communities).
- Go back to the “final unmet demand list” worksheet. Eliminate any occupations with median earnings less than the above calculation.
- The resultant list from these screens represents the final list of occupations with unmet demand.
- The lists will be used in conjunction with a series of questions to interview various stakeholders.

Unmet Demand Findings

The tables below pertain to the respective service areas where unmet demand is equal to or greater than “1” for those occupations that require a postsecondary non-degree award. There was no unmet demand for occupations requiring an associate degree using the methodology outlined in this document. Note, an unmet demand of “1” would not be identified as a shortage; a buffer exists between supply and demand. A threshold also exists under which a higher education institution would not warrant a new program creation or existing program expansion. Therefore, the tables shown below are purely for illustrative purposes; no sizeable shortages were identified through this process.

SVCC Service Area

SVCC Unmet Demand Analysis

SOC Code	Description	2021 Jobs	2031 Jobs	2021-2031 Change	Median Annual Earnings	Typical Entry Level Education	Regional Completions (2020)	Unmet Demand 2022
31-9091	Dental Assistants	79	89	10	\$33,741.15	Postsecondary nondegree award	0	1.04033413
29-2053	Psychiatric Technicians	237	249	11	\$29,852.83	Postsecondary nondegree award	0	1.13594849

CCWA Service Area

CCWA Unmet Demand Analysis

SOC Code	Description	2021 Jobs	2031 Jobs	2021-2031 Change	Median Annual Earnings	Typical Entry Level Education	Regional Completions (2020)	Unmet Demand 2022
29-9098	Health Information Technologists, Medical Registrars, Surgical Assistants and Healthcare Practitioners and Technical Workers	496	525	29	\$62,654.34	Postsecondary nondegree award	0	2.93242332
51-4111	Tool and Die Makers	94	112	17	\$45,364.88	Postsecondary nondegree award	0	1.71417821
29-2057	Ophthalmic Medical Technicians	549	606	57	\$39,769.39	Postsecondary nondegree award	0	5.72371021

General Findings

The above tables identify occupations with an unmet demand greater than one. However, these findings do not reveal shortages in any significant sense or that would warrant supply-side action. Those occupations with sizable shortages in both regions (e.g., home health aides and certified nursing assistants) were screened out via the criteria above and have other contributing factors at play. For example, wages, working conditions, upward mobility and in some instances, threat of automation (e.g., some manufacturing and construction occupations).

Also worth noting, only one occupation listed is not in the healthcare sector but in the manufacturing sector: tool and die makers (CCWA).

Reviewing the data alone would suggest that the higher education pipeline and labor market demand are relatively well balanced in both regions. However, the data does not provide the full picture, particularly for the complex factors relative to academic program development and delivery.

Qualitative Input: Identifying Issues Associated with Unmet Demand

Once the lists for each region were finalized, SCHEV interviewed workforce development/community college stakeholders to identify issues related to shortages:

program availability/capacity, insufficient student pipeline issues, employer issues or other factors. The following individuals were interviewed: Dr. Keith Harkins, VP Academic and Workforce Programs at SVCC; Dr. Elizabeth Creamer, VP Workforce Development and Credential Attainment at CCWA; and Dr. Lori Dwyer, Interim VP Academic Affairs, Reynolds Community College.

Along with the list of occupations with unmet demand, the following questions were shared with each interviewee.

Higher Education-related questions:

1. Regarding the projected unmet demand for the related occupations above, would you define the issues as relating to program capacity, insufficient student pipeline or other factors? (If so, what?)
2. Where have you had success in addressing occupational shortage issues pertaining to similar programs?
3. How did you derive those solutions/initiatives, implement them and measure their success?
4. What practices/examples from other institutions or regions have you incorporated into your own strategies?
5. For those without existing programs or certificates, how does the issue of projected regional labor market shortages play into your decisions about new program development?
6. Is there a tipping point?
7. Is new program development typically faculty, student or employer-driven; can you provide some examples?

Economic/workforce development-related questions:

8. How does SVCC/CCWA work with other stakeholders in the region to address workforce shortages as determined by labor market data?
9. As identified by employers?
10. What strategies have employers in the region deployed to address successfully workforce shortages in related industries/occupations that require certifications or degrees?
11. Collectively? Individually?

12. What other entities have they engaged in/collaborated with to address these issues (e.g., regional economic development organizations, non-profits, etc.)?

The input from these interviews became much larger in scope and is summarized in the key findings section.

Key Findings

The following sections summarize insight from the stakeholder interviews. Three major takeaways from the interviews indicate: 1) Factors of cost and statewide policies create barriers to addressing shortages through program development; 2) In some instances, the labor market data do not reveal the shortages; and 3) the most effective approaches to solving shortages often involve public-private partnerships with active collaboration and adequate funding.

For both regions, the typical process for new program development entails some sort of need as identified by an employer(s) or regional industry. Labor market information is gathered to quantify the need. A next step includes a gap analysis to determine if existing programs in the service area can address the need. If an existing program is of considerable cost to students (e.g., private, for-profit postsecondary institution), the community college may step up to offer the program to serve students more equitably and affordably.

Focus groups, employer roundtables and one-on-one interviews are conducted to drill down to specific needs that can influence program and curriculum development: occupations, job titles, skills, competencies, demand over time, wages, career advancement, etc. After this thorough process, cost, funding and ROI come into play. At this stage many potential programs do not move forward due to start-up costs, ongoing costs and timeline for ROI. Those proposed programs that do move forward include additional steps as part of state VCCS board and SCHEV approval processes.

Process and Policy Barriers

While proper due diligence is necessary, the current processes for academic programs move at the speed of the state government, not at the speed of business. There are pluses and minuses to the current processes but thought should be given to ways to “work around” and respond in a real time manner when necessary. Entities such as CCWA, which are separate from but affiliated with the community colleges, can respond quicker through custom training and short-term program offerings for employers. Opportunities also exist with the

creation of the Virginia Office of Education Economics (VOEE) to systematize the labor market information component of the process and help inform further modifications to program development, approval and review processes.

Industry-specific barriers exist; healthcare offers a prime example in terms of clinical requirements and board testing. In the SVCC region, there are no shortage of students or enrollment capacity issues pertaining to its existing Certified Nursing Assistant (CNA) program. Rather logistical barriers exist for students completing the CNA Board of Nursing exam required for certification.

For example, the Board of Nursing requires all CNA exam registrations be completed online; for rural regions with spotty broadband access, this creates a barrier for some students; SVCC addresses this barrier by assisting students with registration while on campus. Current policies require the tests be offered by third party entities not at or by the community colleges offering the program. This can create issues especially for rural community colleges when the nearest exam is proctored more than two hours away. The CNA certification exam registration process, cost and distance to testing facilities are significant barriers for rural students and especially given the low, entry-level wages for those positions once certified. Often, this last stage of the program serves as a “disincentive” for completion. Policy considerations should be given to allowing community colleges to proctor CNA certifications (and other applicable program certifications) on campus to improve the talent pipeline.

Clinical experience is vital to healthcare postsecondary programs, not just for accreditation, but for invaluable training and experience as part of the program. Clinical rotations were challenged by COVID, put on hold or abbreviated. While use of simulation equipment is common (e.g., CNA and phlebotomy programs), there should be state-level consideration for expansion and as a substitute for some clinicals; COVID created a bottleneck in some instances in this regard.

Cost Barriers

The cost of clinical space and equipment also present barriers to program development. Even when new programs may be needed, the startup costs, operating costs and ROI may be insurmountable barriers. The cost of academic healthcare programs is high. One example of this pertains to radiation therapist programs. The cost of equipment for training is significant. As a result, only a handful of radiation therapist programs are offered in Virginia. For

example, Central Virginia Community College (CVCC) offers this program but is limited to 10 students per year as that is all that the local hospitals can allow capacity-wise for clinicals.

Another example of barriers to entry pertains to physical therapy assistant programs. Unless a community college can form a partnership or obtain a significant contribution from a benefactor, the costs are prohibitive: PT assistant programs require two years to become accredited before the program can be offered. At a minimum, this requires finding and paying a program coordinator. The coordinator cannot be the instructor; the coordinator must be a licensed physical therapist. To attract such a person to higher education from a well-paying clinical profession is the first of many obstacles with the ROI being a long-term endeavor.

Nursing programs face similar barriers especially due to COVID, competing for students and clinical space issues. COVID also prompted a sizeable loss of nursing instructors. These themes/barriers also apply to dental hygienist programs. There is also the question of how many graduates the region can absorb; this is more acute in the rural regions. While VCCS has made a budget request to increase capacity within existing nursing programs, industry and current policies must support this to see results.

Several entities within Virginia are working to address various policy and systemic issues related to postsecondary healthcare degree and non-degree programs. The Virginia Healthcare Workforce Advisory Board, Claude Moore Foundation and others have developed a series of recommendations in advance of this next legislative session to look at many of these broad barriers along with strengthening initiatives that aim to address them. The recommendations are just the beginning of the longer-term work to address the complex, interrelated issues associated with the healthcare professions. VOEE should engage with these partners to help inform quantitative analysis for this specific sector.

Many of the same cost barriers also exist for construction (infrastructure) and manufacturing programs. If the region's employers need only a few new positions per year, the demand won't warrant the cost. Specific short-term training may help address the need. Additional training also could be incorporated within an existing program. For example, if an employer has specific welding needs that don't require new equipment for training, an existing welding program can include a relevant curriculum add-on to meet an employer's needs.

Truck driving/CDL and power-line worker programs are two other "high demand" offerings with significant program delivery costs. One work-around for the CDL program was to

reduce from a semester long course to a four-week program. This helped address shortages in the SVCC and CCWA regions while lowering costs.

Data Limitations

Sometimes the data do not identify the unmet demand. Powerline workers in SVCC illustrate this issue. Virginia’s power line industry is part of a multi-state collaborative including Delaware, Maryland and Virginia (DELMARVA). The vast majority of the line workers are not employed by Virginia companies but via contractors, companies that support the electric cooperatives, Dominion Energy and Appalachian Power. Most of these contractors are based out of North Carolina and serve the DELMARVA region.

With the industry facing massive retirements a need exists across the state and in SVCC for a power line training program. However, this need was not identified/supported by the unmet demand analysis as the data were listed as “insufficient.” Again, this has to do with out-of-state contractors being used. Additionally, the cost of creating a new power line program can exceed \$1M with sizeable ongoing course costs. The subsequent section of this report includes a summary of how a public private partnership was formed to address this need.

CONSIDERATIONS FOR A NEW LEARNING ECOSYSTEM

This section highlights key assets and successful approaches to address unmet demand and emerging industry demand. The assets identified below form the basis for a new learning ecosystem. Successful approaches for one sector can be modified as needed and piloted for other sectors facing similar barriers.

The assets for a reimagined learning ecosystem include:

- Flexible funding for innovation
- Reimagined classrooms/learning spaces
- Coordinated statewide solutions with regional roles
- Re-engineered approaches to workforce training
- Innovative, symbiotic public-private partnerships

Flexible Funding for Innovation

Tuition money is easier to obtain than flexible funding sources. However, institutions often need flexible money to put resources where they are most needed. Community colleges must be able to work with the VCCS to raise money and seek matching funds from industry or philanthropic organizations to seed such flexible funding and address unmet demand. Whichever entity controls those funds can use them to address obstacles as they arise. The obstacles may be industry or program specific, campus or system-wide.

The existing funding structure cannot be used for capacity building but to provide educational services and operations. Program expansion, given this structure, requires prioritizing state resources and thinking creatively about funding. Programs can't be developed and scaled to sufficiently meet the needs with only state funding. Formation of a community college innovation fund could help address these issues, enabling flexible use of funds to launch new programs. Additionally, public private partnerships can provide additional funding and strengthen programs through investment in curriculum, job placements, etc.

Reimagined Classrooms/Learning Spaces

Many community college facilities were built for traditional classroom use. Those classrooms are now too small, out-of-date or not relevant to today's "hands on learning." Classrooms, for example, may not be conducive for a trades class. At some point resources need to be

targeted to address this issue, which could involve renovation of existing spaces or thinking outside the box and looking at vacant commercial or flex space in the region. In response to changing spatial needs, many community colleges have had to lease space.

For example, Germanna Community College leased space in a commercial strip mall for its [Fredericksburg Center for Advanced Technology](#). Forsyth Technical College in North Carolina was gifted an empty strip mall by the City of Winston-Salem. That space is now home to [Forsyth Tech's Transportation Technology Center](#). Implementation of Virginia's Fast Forward program also necessitated the lease of additional space.

Partnerships between regions, localities and the community colleges can offload empty or underutilized space, reinvigorate commercial spaces and spur additional commercial revitalization efforts offering up a "win-win" situation. This can also result in a reimagined campus environment that is commercially oriented and with a potentially larger, fragmented footprint.

Coordinated Statewide Solutions and Regionally Specific Roles

Not every community college needs to offer every program. Continued strategic thought is needed about how best to position each college and the system collectively to address labor market shortages. Here state leadership, SCHEV and VCCS can coordinate needs, expertise, capacity and resources to holistically address shortages, identify existing programs and how to increase capacity creatively. This includes engaging industry and VOEE in the discussions.

For example, two community colleges can increase capacity of a healthcare program in tandem with a hospital/health system agreeing to increase clinicals. This could involve shipping/sending students to another community college to complete clinicals where facilities already exist and then back to the home community college to complete the course work. The approach should be holistic – solving complex puzzles with existing pieces, not just creating new programs.

Re-engineered Approaches to Workforce Training

As mentioned previously, business and higher education currently operate at different paces. In order to effectively address unmet demand issues, both must be in closer lock-step. If Virginia's community colleges want to forge world class partnerships with industry, the pace must pick up. Virginia needs to rethink how it allows community colleges to operate on the

workforce training side, strengthening the learning ecosystem in partnership with the community colleges, regions and industries.

The existing system model of program development makes it difficult to dismantle and challenging to shift programs and resources to respond to market demand (e.g., increased need for CNAs). For example, long-term care facilities and hospitals are willing to hire CNA students day one and pay them full time wages while enrolled in the program, carrying them until they obtain certification. However, existing challenges on the college side include lack of lab space, faculty and a lengthy process to create new programs. Faster state procurement needs to occur. Faculty pay also must be aligned with market demand for the subject matter expertise and pay on the same pay scale as university faculty. Recruitment budgets need to be increased.

All of the above are challenged by the current processes and policies; formation of separate but affiliated workforce development entities (e.g., [Lord Fairfax](#) and [CCWA](#)) make these types of activities more doable. Modest funding for pilot projects in this area also would benefit the community college system. The pilots can work toward expanding capacity, getting programs that align with industry needs, not just core competencies, but to scale. Pilots focusing on manufacturing will be easier to launch, quicker to implement and easier to market.

Production of visual career pathways maps, such as those by VCCS, CCWA and SVCC for this project, is an important step in this process. The maps illustrate a stepping stone approach to degrees that work for working adults. Pathways hone in on short-term certificates and build toward an associate degree with more options to progress. The pathways approach offers bite-sized credentials conducive to working full time versus finding a full-time worker.

Lord Fairfax Community College and CCWA offer workforce development solutions separate from their affiliated community colleges. Virginia should consider the above approaches to maximize responsiveness and increase funding as well as encourage public private partnerships.

Innovative, Symbiotic Public Private Partnerships

The Case for Public-Private Partnerships

Public-private partnerships should be curated based on the industry/occupation needs in a region. Those with few very large employers in a given industry often require primary conversations for specific needs, focusing limited resources to increase enrollment and the subsequent workforce where the occupations/programs align.

For industries/occupations in a region with many smaller-sized employers the approach may be different. Take welding at CCWA for example. Many employers may hire a few welders each. In this instance, community colleges/workforce development entities must lean in and validate demand through wider spread employer engagement.

Three examples below illustrate effective public-private partnership in the SVCC and CCWA regions that are addressing unmet demand and emergent industry needs. These serve as models for other regions and states to consider and scale for other industries.

Power Line Worker Program (SVCC)

In the previous section, mention of data limitations led to an example of the power line worker training program. To address this issue effectively, SVCC, VCCS, industry partners and industry associations came together to form a public-private partnership. [The partnership](#) originated from a town hall meeting discussion. With contractors and massive retirements, no existing power line worker training schools were close by.

Help came from across the state and across partners. SVCC came to the VCCS system office requesting a match if the electric cooperatives raised \$500,000 for the program creation. The challenge was surpassed to address the industry need: Virginia, Maryland and Delaware electric cooperatives raised \$1M in eight weeks. The power line worker training is one of the most effective and expensive PPPs in which SVCC has been involved. One truck for the training program costs \$200,000; three to four trucks are needed. Poles also are used for training; each pole costs \$800 and students will go through 15 poles per class. The [Power Line Worker Program](#) currently trains 30 line workers per class. One company offered every student a job at graduation, signaling the demand. It took leadership on the government side to seed the money for the match as well as industry support.

Toyota T3 (Reynolds Community College)

Toyota Motor reached out to Reynolds Community College (JSRCC) to be one of 38 formal U.S. training providers for all Toyota technicians. JSRCC currently has an automotive program that is being strengthened by this [partnership](#). Benefits of the partnership include a stronger fleet of vehicles for training and structured focus groups with automobile industry members providing curriculum input. Students also will receive work-based learning at regional dealerships, getting paid throughout the training. The program is still in its infancy with the first cohort launching in 2022. Pending screening criteria, students passing the curriculum will receive guaranteed interviews. Courses also will reference interview processes, starting salaries, wage growth and advancement.

The partnership shows that when groundwork is laid early, when the right partners are at the table to develop programs, it is a “win” for everyone: students, community colleges and employers. Students are provided with various incentives – paid, work-based learning. JSRCC is getting a stronger curriculum, better equipment and providing better students with a better experience. Employers are getting a labor force and longer-term talent pipeline.

Pharmaceutical Manufacturing Collaborative (CCWA and partners)

Responding to an [emergent industry need](#), Growth and Opportunity (GO) Virginia funded a [coalition](#) to strengthen pharmaceutical manufacturing in the CCWA (Richmond) region. The coalition included an infusion of external money from GO Virginia partners, a GO Virginia grant, and an in-kind contribution from VEDP. Partners included CCWA, Virginia State University, Virginia Commonwealth University, VEDP, Phlow, Ampac, Civica, Medicines for All and others.

The coalition spent months looking at labor market information and talking with companies. The process included identifying the types and number of employees, job titles, prerequisites for each position, identifying characteristics of successful applicants. The next step was to create an outline for a program that was not limited to community colleges but an entire industry sector with career fields, job promotion and opportunities across the board. The coalition worked to develop non-credit workforce training courses, academic credit bearing studies certificates and stackable credit. This innovative coalition across two- and four- year institutions, regional economic development and industry partners illustrates a holistic and disruptive [model](#) in support of the emergent pharmaceutical manufacturing industry cluster.

CONCLUSION

Assessing unmet demand within a state or region is a complex endeavor that includes quantitative and qualitative factors. While it is feasible for various stakeholders or groups to undertake such an analysis, significant benefit exists in having an expert group or entity devoted to such complex analysis and data translation for actionable insight by students, institutions, policymakers and employers. In Virginia, the “go to” resource for this type of analysis is VOEE.

In turn, VOEE actively should engage stakeholders at the state and regional levels to provide the qualitative insight around the data. The CCWA and SVCC regions provided the qualitative insight for this project deliverable.

The unmet demand calculations, for purposes of this project, did not reveal any significant occupational shortages. On the other hand, the barriers and assets related to addressing shortages are acute and impact the three sectors for this project: Construction (infrastructure), healthcare and manufacturing. Barriers include existing processes and policies, program startup costs and operating costs as well as data limitations.

Despite the barriers, an opportunity exists to address labor market shortages through higher education academic programs and will require a resultant new learning ecosystem to take shape.

The Commonwealth of Virginia stands poised to foster such a new learning ecosystem through ongoing collaboration between higher education, economic development, workforce development at the state and regional levels. The activities and support from this Strada Recovery Incubator grant provide a boost toward this forward-minded, comprehensive approach.

ACKNOWLEDGEMENTS

SCHEV staff extend sincere gratitude to the cross-system leadership team for guidance on this project deliverable. The cross-system leadership team includes: Mr. Peter Blake, Mr. Jason Brown, Ms. Sara Dunnigan, Dr. Megan Healy, Dr. Stephen Moret and Dr. Randy Stamper. SCHEV is grateful for the time and insight that the grant partners provided in support of this effort, including the regional partners: CCWA, Reynolds Community College and Southside Virginia Community College. Jim Andre and Emily Fay also are recognized for their consultation throughout this project and for assistance, in particular, with the unmet demand analysis.