SKILLED TRADES DEVELOPMENT

An Applied Policy Project Prepared for the Town of Pennington Gap, VA

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DISCLAIMER

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Abbreviations

ACS	American Community Survey
ANP	Apprenticeship Network Program
APP	Applied Policy Project
ARC	Appalachian Regional Commission
BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
CDFI	Community Development Financial Institution
CEDS	Comprehensive Economic Development Strategy
CT	Center for the Trades
CTE	Careers in Technical Education
FSPAR	Feasibility Study and Preliminary Architectural Report
GO TEC	Great Opportunities in Technology and Engineering Careers
GO Virginia	Growth and Opportunity Virginia
HVAC	Heating, Ventilation, and Air Conditioning
IA	Invest Appalachia
LCHS	Lee County High School
LDD	Local Development District
LENOWISCO	Counties of Lee, Wise, Scott, and the City of Norton
MECC	Mountain Empire Community College
NPV	Net Present Value
VADHCD	Virginia Department of Housing and Community Development
WCCPS	Weldon Cooper Center for Public Service
IALR	Institute for Advanced Learning and Research

Executive Summary

This Applied Policy Project (APP) provides an in depth analysis of a significant public policy problem faced by the Town of Pennington Gap, VA. Skilled trades professionals, especially plumbers, HVAC technicians, and skilled construction workers, are underprovided by local labor markets. As a result, organizations in this region must either source skilled trade labor from outside of the region or further delay in carrying out regional strategic economic development initiatives involving construction projects, and private citizens who need professional maintenance done on their homes must continue to leave their homes in disrepair.

Following numerous hours of interviews with stakeholders, research on public policies to increase local skilled trade labor supply, and analysis of the policy problem's context, this analysis identifies three alternatives as potential courses of action for the Town of Pennington Gap to pursue in order to effect change on the problem. These alternatives are 1.) for the Town of Pennington Gap to construct and operate a 9-unit business incubator called the **Center for the Trades** (CT) to attract potential skilled trades startup entrepreneurs; 2.) for the town to partner with Mountain Empire Community College (MECC) and Lee County High School (LCHS) to build an **MECC Satellite Campus** that enables increased provision of plumbing, construction, and HVAC training programs in the county; 3.) for the town to implement an **Apprenticeship Network Program** (ANP) that connects employers specializing in construction, HVAC, and plumbing, with existing skilled trades laborers and graduates from MECC or LCHS vocational education programs specializing in the same or similar areas.

Informed by a host of publicly available literature and data resources this APP projects the expected outcomes that would result from letting present trends continue or implementing each of the three alternatives with respect to their economic value, fundability, and administrative feasibility. Upon weighing each of these outcomes against one another with respect to these criteria, this analysis finds that implementing a trades focused **MECC Satellite Campus** is the optimal course of action for the Town of Pennington Gap to take in order to increase the skilled trade labor supply. However, in the event that Pennington Gap is unable to secure outside funding to carry out this alternative, the Apprenticeship Network Program would be the next best course of action.

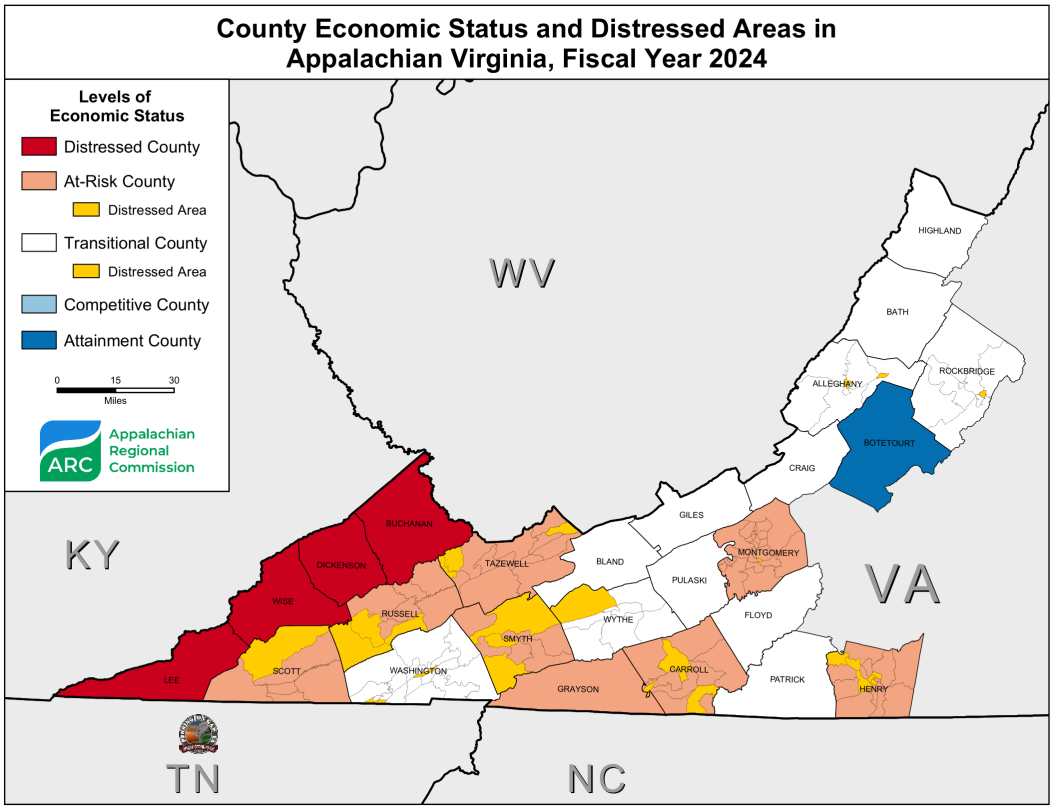
The Problem

Problem Statement

The Town of Pennington Gap, VA faces a significant public policy problem. Skilled trades professionals, especially plumbers, HVAC technicians, and skilled construction workers, are underprovided by local labor markets. As a result, organizations in this region must either source skilled trade labor from outside of the region or further delay in carrying out regional strategic economic development initiatives involving construction projects, and private citizens who need professional maintenance done on their homes must continue to leave their homes in disrepair.

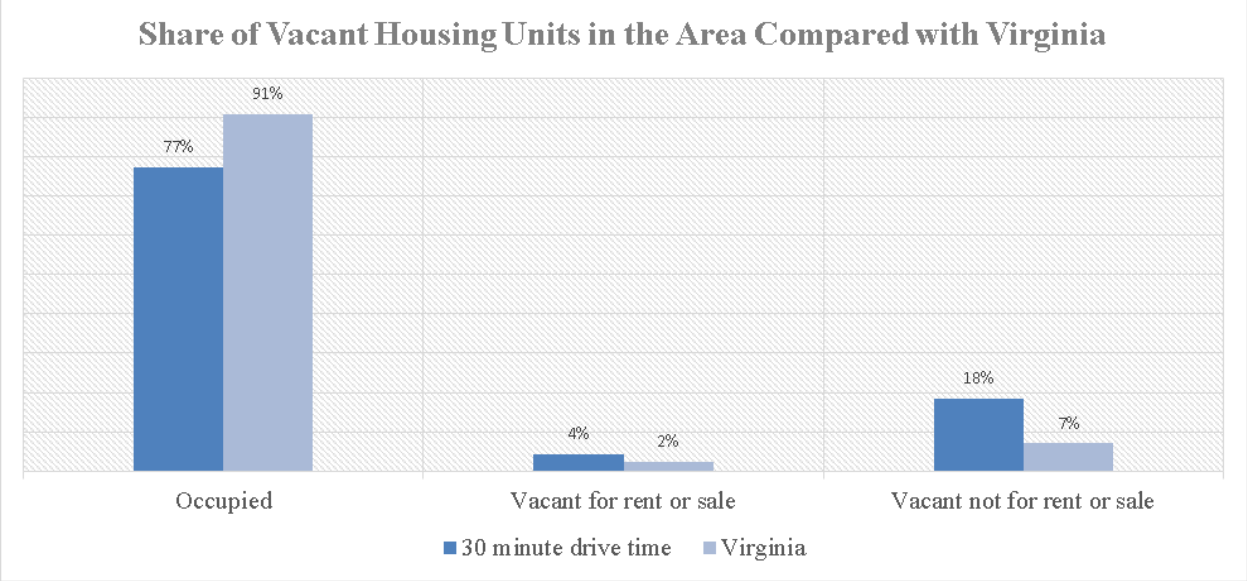
Importance

The skilled trades labor shortage is not just limited to the Town of Pennington Gap. This problem is also prevalent among the greater area, including the Virginia counties of Lee, Wise, Scott, and the City of Norton (LENOWISCO), According to the Virginia Department of Housing and Community Development (VADHCD), the LENOWISCO Planning District Commission (PDC), is one of twenty "voluntary associations of local governments intended to foster intergovernmental cooperation by bringing together local elected and appointed officials and involved citizens to discuss common needs and determine solutions to regional issues." Two out of three counties in LENOWISCO PDC (a.k.a. Local Development District or LDD by the Appalachian Regional Commission or ARC) are classified by the ARC as 'economically distressed' counties, which means that they rank in the **10% most economically depressed** of the nation's counties with respect to three-year averages of unemployment rates, per capita



market incomes, and poverty rates (Virginia Appalachian Regional Commission, 2022). Given the purpose of Virginia's PDCs, the work of the LENOWISCO PDC must address the economic distress of these counties.

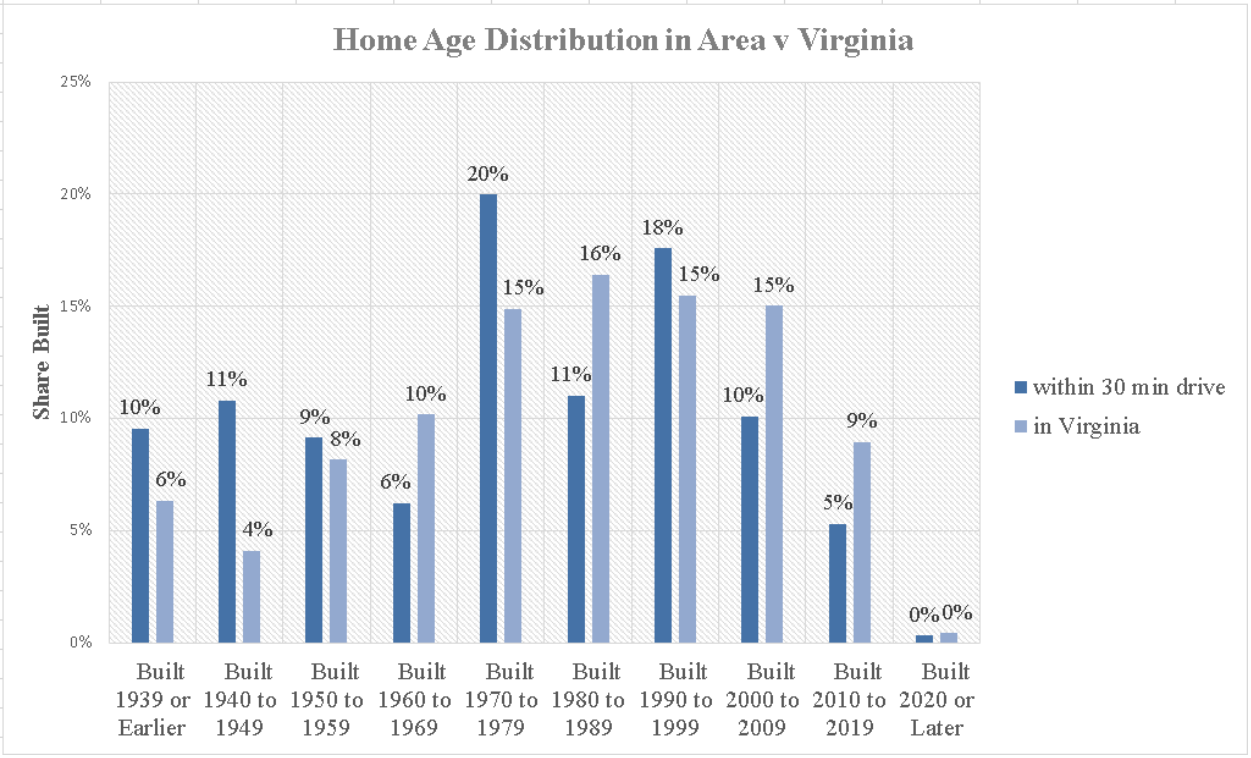
The LENOWISCO PDC has assembled stakeholders including but not limited to "…government agencies, representatives of private sectors, education providers, non-profits, community and labor groups, workforce boards…" to outline its Comprehensive Economic Development Strategy (CEDS) which is required by US Economic Development Administration (EDA), every five years, to assess the current economic state of the region and identify "…strategies to guide regional economic development, forge partnerships, and improve economic outcomes and quality of life" (LENOWISCO PDC, 2022). Currently, the 2022 comprehensive strategy for LENOWISCO PDC identifies a host of local development construction projects that would be instrumental in achieving these aims. However, according to Duane Miller, the LENOWISCO PDC's Economic Development Director, the regional shortage of skilled trades labor is either forcing the projects to source skilled trades labor at higher opportunity costs from outside of the region or preventing these projects from being funded and carried altogether. While these delayed construction projects only represent one aspect of LENOWISCO's strategy, the skilled trades labor shortage represents the most significant barrier. If public policy fails to address this problem, any hope of shedding the economically distressed labels off of LENOWISCO's municipalities is futile.



(ACS, 2022)

While it is difficult to find specific data that there is a great deal of local demand for construction related trades, a few publicly available data support this theory. The above figure uses housing data from the American Community Survey to compare the shares of housing stock that are vacant and not for rent or sale between the populations of Virginia and the 30 minute drive radius of Pennington Gap. While the housing occupancy rate in the 30 minute radius is 14 percentage points higher when compared with Virginia, the share of vacant units that are not for rent or sale in the 30 minute radius is more than twice as high as Virginia's. Additionally, the below figure shows how homes within the 30 minute drive radius are older on average than homes in Virginia. While there could be other explanations for this disparity, such as families

who own more than one home, but based on these statistics, it is reasonable to assume that at least a portion of this relative vacancy increase is caused by home disrepair.



(ACS, 2022)

Problem Context

Client Background & Orientation

The client to whom this Applied Policy Project (APP) is oriented is the Town Manager of Pennington Gap, Keith Harless. The Town of Pennington Gap is located in Lee County, VA, one of the LENOWISCO PDC's economically distressed counties. For Fiscal Year 2024, according to the ARC's database containing economic indicator indices of the 3,113 US counties, Lee County ranks as the 126th most economically distressed county in the US (4th percentile) and is the 36th most economically distressed county among the 423 counties that comprise the ARC (8th percentile). Given the staggering degree of economic distress in Lee County, the skilled trades labor shortage hindering LENOWISCO PDC's economic development initiatives has a direct negative impact the client's chances of alleviating the economic distress of Pennington Gap.

In August of 2023, as a Tadler Fellow in Impact Investing, I was matched with this client by Professor Christine Mahoney from a pool of clients based in Southwest Virginia that were selected by Shannon Blevins, the Vice Chancellor for Administration, Government Relations, and Strategic Initiatives at the University of Virginia College at Wise. At the direction of this coordinated matching process, I was assigned to conduct my APP in support of Pennington Gap's prospective Center for the Trades (CT) project. At that time the CT was envisioned as an incubator facility that would provide cost efficient workspace and support services to start-up and developing trades' entrepreneurs in order to promote local business growth.

The initial vision for the CT implies that affordable industrial real estate shortage is the policy problem of interest instead of a shortage of skilled trades labor for the Town of Pennington Gap or the surrounding region (i.e. LENOWISCO). However, report will further delineate by examining the theory of change for the CT and how it relates the economic interests of Pennington Gap, LENOWISCO, and other relevant agents in the problem ecosystem, it is more appropriate to frame the policy problem as a skilled trades labor supply shortage.
When I met with Keith in late August, he described the Center of the Trades as a current economic development initiative for the town but that funding for the project remained its biggest barrier. Keith was under the impression that my role was to help him market the project to garner financial support for its development. After clarifying with Keith what I would be able to produce through the APP that could support the town's economic development, we arrived at the consensus that as long as my work could be useful in gaining funding support for a vision of the CT that ultimately benefits the economic state of Pennington Gap, it would not matter if the final recommendation of this APP deviates from the vision of the CT presented in the Feasibility Study.

Feasibility Study & Preliminary Architectural Report

Upon my assignment to the CT, Shannon Blevins provided me with a publicly available Feasibility Study and Preliminary Architectural Report (FSPAR) for the CT that was conducted by the Hill Studio, an architectural design firm based in Roanoke, VA that was paid for by $100,000 in grant funding secured by Pennington Gap from the ARC and VADHCD.

While the opening section claims that the Feasibility Study assesses the community, economic, and physical feasibility for the CT through a market analysis, a closer look at the report challenges this notion. For example, the market analysis section is merely summary of regional demographic and employment statistics from the American Community Survey (ACS) and the Weldon Cooper Center for Public Service (WCCPS) at the University of Virginia as well as the completions of the following four trades-related programs at the three community colleges within a two hour drive time of Pennington Gap from 2016-2020: Electrical, Electronic, and Communications Engineering Technology/Technician; Welding Technology/Welder; CAD/CADD Drafting and/or Design Technology/Technician; and Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician. The report does not go into any further detail about which programs are available at each college, nor does it further analyze how these statistics build an economic case for the feasibility of the CT, let alone define what feasibility actually means in this context.

Nevertheless, it's important to highlight a few local economic statistics that the Feasibility Study gleaned from the ACS and the WCCPS as they maintained relevance to the policy problem definition as it evolved:

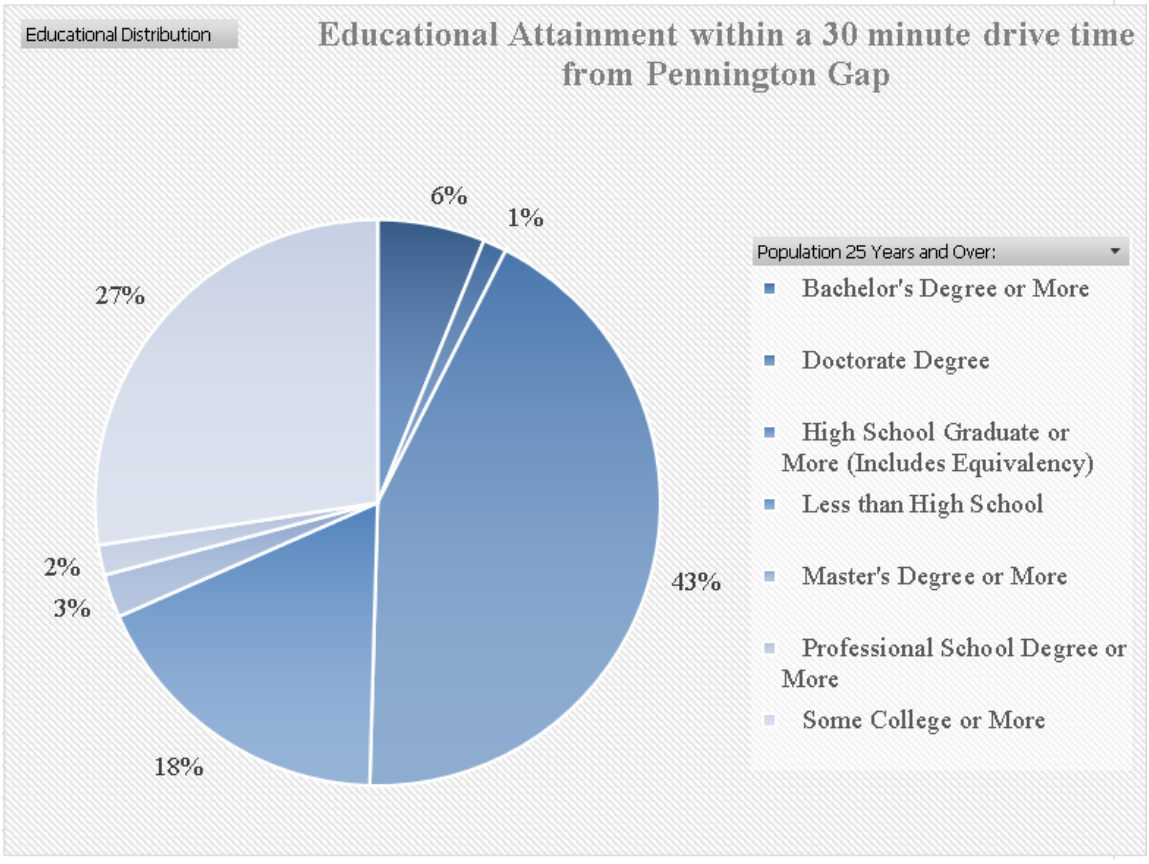
- annual median household income in Pennington Gap is comparatively low in the region at approximately $26,235.
- Median household incomes in Pennington Gap are lower than in most of the surrounding counties in the 60-minute drive time area ($41,913), which is significantly lower than the median household income in the state ($74,222).
- Nearly half (48%) of households in Pennington Gap earn less than $12 per hour, while less than 20% in the study area have annual household incomes under $25,000.
- Approximately 26% of families in Pennington Gap live at or below the poverty line with approximately 18% of families among adjacent counties living in poverty.

- The unemployment rate for Pennington Gap in 2021 was 9.2%, which is roughly 18% higher than the rate among adjacent counties.
- Trade jobs decreased by 41 jobs from 2015-2020 in the 60-minute drivetime (-9.4%), compared to the national growth rate of 2.1%.
- Trades jobs are projected to decrease by 29 from 2020-2025 (-7.4%) compared to the national projected growth rate of 4.2%

Other Problem Components

Current Town Labor Statistics

According to the feasibility study's market analysis, 68% of Pennington Gap's population (1,145 out of 1,684) was not in the labor force in 2022 (Feasibility Study, 2022). For the labor force the unemployment rate was 9.2%. In 2017, a study commissioned by the Environmental Protection Agency (EPA), the US Department of Agriculture (USDA), and the Appalachian Regional Commission (ARC) reported that Pennington Gap had 55 residents who live and work in town, while 486 residents were employed outside of town. Additionally, there were 1,107 people outside of Pennington Gap who work in town (Cool & Connected, 2017).



(ACS, 2022)

Historical Context of Problem

For most of the 20th century, the coal and tobacco industries were foundational to Pennington Gap's local economy. However, with the ongoing decline of tobacco production and

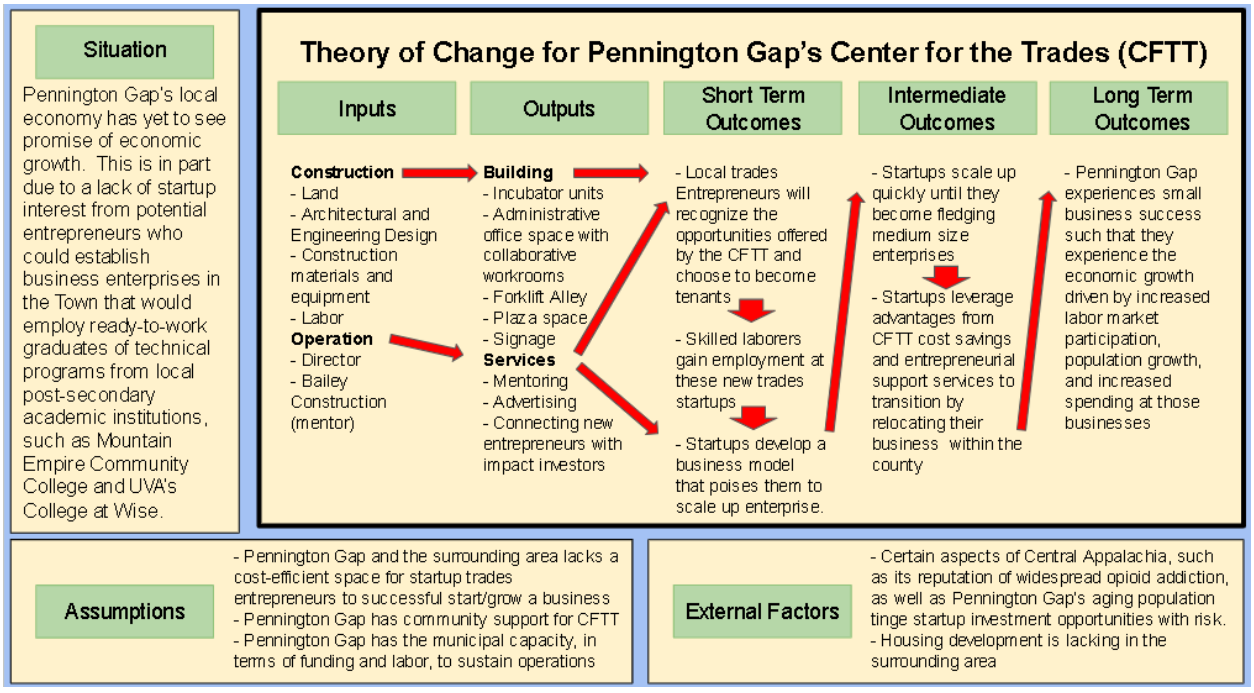
the coal mining industry Pennington Gap, along with many other communities in Central Appalachia, has lost the foundation of its economy and now faces unemployment, population decline, business closures, and associated social issues such as substance abuse disorders. As these trends have worsened, Pennington Gap has become less attractive for venture capital startups or other entrepreneurial endeavors who perceive riskiness as a result.

Geographic Factors

Pennington Gap is disconnected from the economic growth/activity in North, East, or Central Virginia. Pennington Gap is greater than a 45 minute drive away to the closest city, which is Kingsport, Tennessee. As a result of thin regional population and remoteness, local developers are scarce, which inhibits new development (Virginia Tech, 2017). Meanwhile, some commercial and industrial property that has gone unused for several years has begun to fall into such disrepair that it reduces available real property according to Shannon Blevins, the UVA Wise contact for Tadler fellows.

An Implied Theory of Change

Pennington Gap could not have secured $100,000 in funding from the ARC and VADHCD for the originally envisioned CT's Feasibility Study without the support signaled by numerous stakeholders in the form of partnership commitments by stakeholders such as Mountain Empire Community College (MECC) and Bailey Construction Company. This existing support and momentum justified an examination of the logic behind the CT through the construction and analysis of the logic model below:



From the vision of the CT, I discerned that the implied policy problem could be defined as follows: "Startup entrepreneurs who would rely on skilled trade laborers who graduate from

technical schools in the surrounding area are not choosing Pennington Gap as a viable location to plant and develop businesses that would generate local economic growth." This policy problem is roughly interchangeable with the situation defined in the above model. I chose this as my policy problem because it both tackles the problem that my client has identified, but also would give my APP enough latitude to explore alternatives that may function as variations on the CT as it is currently envisioned.

It is important to note that there is little to no quantitative evidence to support the assumptions identified in the model and that the list of assumptions is not exhaustive. Still, it is vital to derive these assumptions from the CT's current vision to construct a logic model that illuminates gaps for which more research could support the initiative's fundability and viability. For example, if the current data supports the first assumption, it will strengthen the case that the CT's provision of a cost efficient space for trades startups would properly address a potential root cause of the policy problem (i.e., a supply shortage or other market failure).

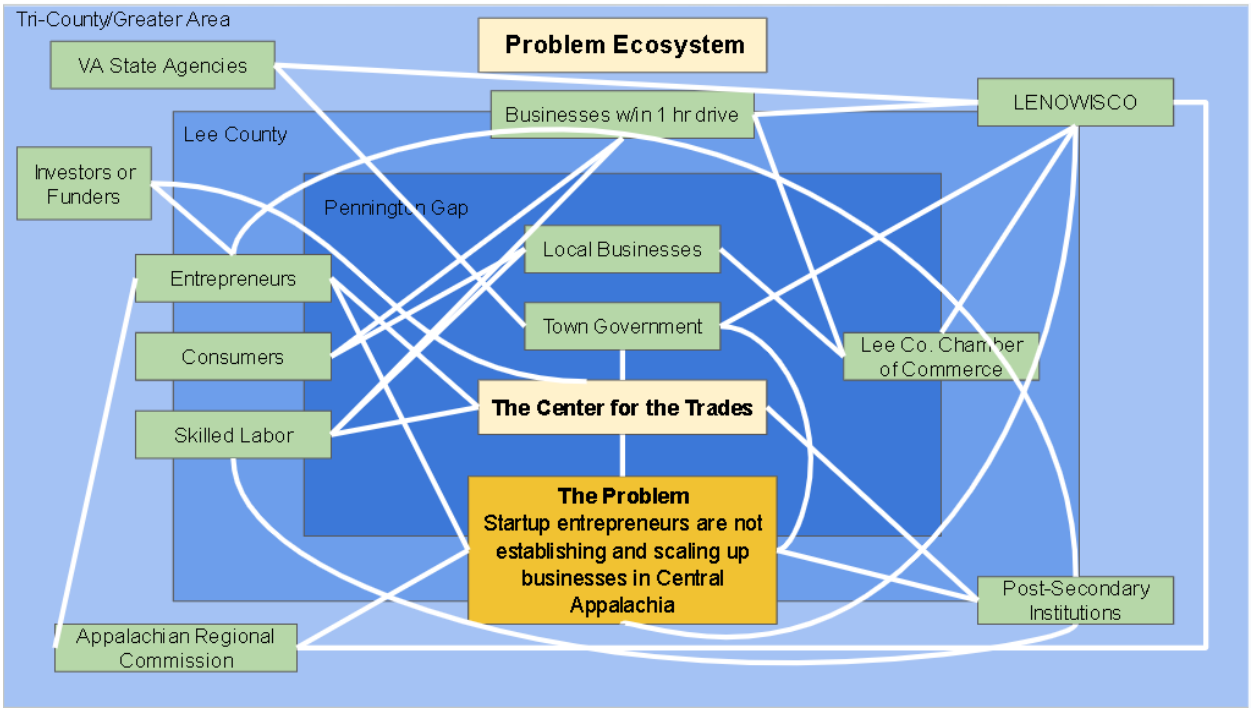
Much like in the assumptions section, the model's external factors are non-exhaustive. The first factor mentioning Central Appalachia's reputation of riskiness could discourage the CT's success *even if* the CT promotes a cost-efficient place for startup and developing trades entrepreneurs to succeed. The same goes with the lack of housing development in the area as both negative factors may be more influential than cost when potential entrepreneurs calculate their choice about where to locate their startup.

Inputs and Outputs for the model were relatively simple to identify as most of these components were explicit in the FSPAR. While it was tempting to include funding as a potential input, it was more appropriate to keep that in the assumptions block because the construction of the project will ultimately rely on external funding to begin with and the unknown factor regarding how the operation of the CT will be funded is what I want my alternatives to ultimately address. The bottom two service outputs were not included in the FSPAR but they are included in this model to fill a crucial gap between outputs and outcomes.

Finally, the outcomes included in the model are divided into short-term, intermediate, and long-term outcomes to clarify the logical flow that connects the outputs to the CT's goals that aim to address root causes of the policy problem. Based on the FSPAR's vision for the CT, the root causes inherent to the policy problem include a lack of cost-efficient space for entrepreneurs to succeed and a lack of entrepreneurial expertise among the young locals who would be motivated to start a business. The outcomes address these root causes respectively, by providing low cost incubators and services to support young entrepreneurs' growth in the fundamental knowledge they need to succeed and scale.

The Problem Ecosystem

To clarify the stakeholder groups and actors who influence and/or are influenced by both the policy problem and the CT this Ecosystem Map (below) was developed. The three rectangular layers represent the levels of government and their proximity to the CT, represented by the beige box in the center, as well as the problem, which is represented by the yellow box across all levels. The green boxes represent the stakeholders/other actors and paragraphs that follow delineate who these agents are, what role/s they play in the ecosystem, and the relationships that the white connections among them represent.



Town Government:

This block refers to Pennington Gap's Town Council and the Town Manager. As apparent through its connections this agent is trying to address the problem both through development of the CT and by improving the town's status as a tourist attraction. This group also interacts with Virginia's state-level agencies, such as the Department of Housing and Community Development (DHCD) to secure funding for the CT and other economic development projects, as well as the agencies' smaller scale planning commissions like LENOWISCO to coordinate the economic development initiatives on the regional scale.

Consumers, Skilled Labor, and Entrepreneurs:

These groups exist across all levels of scale and are arguably the most consequential players in this ecosystem. The Entrepreneurs block specifically refers to those who are prospective business owners, and do not yet own businesses in or outside of the town. With or without the CT, they have direct influence on the problem as their ownership and operation of a successful business at any level of scale would produce a positive impact. However, the client should be primarily concerned with those who might consider starting a business within the town. Entrepreneurs may rely on investors/ funders, the Appalachian Regional Commission (ARC), or Post-Secondary institutions to support their business ventures either through direct funding or technical assistance. Consumers are the primary source of revenue for business within and outside of the town. As entrepreneurs start up and become the owners of local or regional businesses, they must consider consumer preferences, demand, and interest in their products or services. Skilled labor refers to those who are both employed (by local or regional businesses) and unemployed (ready-to-work graduates from technical programs at post-secondary institutions). The market for this labor is something that any entrepreneur (or any

other actor who determines the CT's vision) must understand to utilize the CT in a way that accelerates local economic growth.

Post Secondary Institutions:

Post-Secondary institutions include local community colleges, such a Mountain Empire Community College, or universities, such as University of Virginia's College at Wise (UVA Wise). Community colleges are a key producer of skilled labor in the region, especially the labor that would fuel the prospective CT tenant businesses, while UVA Wise could be a potential producer of young entrepreneurs with a strong interest in starting up businesses in the local or regional area. UVA Wise is also heavily interested in the economic development of the entire region and is coordinating with various actors across scale to address the policy problem (case in point, they played a crucial part in placing Tadler Fellows with their clients across the region).

Businesses, Chamber of Commerce, and LENOWISCO PDC:

The role of existing local and regional businesses, which are partially represented by Lee County's Chamber of Commerce, should not be overlooked in the problem ecosystem. While it may be intuitive that Pennington Gap's economic growth, aided by a CT, would be a win-win for everyone in this ecosystem, some of these stakeholders could view the CT as making their lives harder. For example, a current construction company in the same county that is facing a labor shortage may see a contracting business starting up at the CT as a competitor drawing from an already sparse labor market and may ultimately stand to profit from the failure of such an initiative. LENOWISCO, the DHCD's Planning Commission for Lee, Norton, and Wise Counties obviously wants to solve the problem, but must balance the interests of existing businesses because the failure of those business could exacerbate the problem.

Evidence Review

While the town of Pennington Gap envisioned the CT as a cost-effective space for entrepreneurs to succeed, interviews with the LENOWISCO PDC and the Industrial Development Director at Mountain Empire Community College revealed that these key stakeholders envision the CT as a space that primarily stimulates the entry of skilled trade labor in the local market. This misalignment of expectations for the CT among stakeholders requires an analysis of the incubation model and its impacts on both entrepreneurial growth and labor supply. This section reviews the quality and consensus of academic literature concerning the impacts of incubators on local entrepreneurial growth and the skilled trade labor supply and presents an overview of one alternative skilled trades labor development model from Danville, VA.

Incubators

Do business incubators have a causal effect on local business startup rates and labor supply? Despite the existence of over 7,000 business incubators in the United States, according to the National Business Incubator Association, the empirical evidence behind this notion is thin at best.

Little to no public or academic studies have attempted to derive the causal effect of business incubators on outcomes related to entrepreneurship and skilled labor supply via quasi-experimental methods. Nevertheless, a few papers have found some supportive evidence. A

2021 report drew from 14 impact evaluations of incubators and accelerators to find increased, albeit unspecified, employment rates for employers who participate in these facilities (Madaleno et al., 2021). However, this study did not disentangle the effects between accelerators and incubators. It also did not determine whether or not the employment gains drew workers from the local labor supply, or the sectors of employment affected. Additionally, the sample of studies contained a disproportionate number of European evaluations, making the applicability of findings to Pennington Gap tenuous. A 2018 study that explored the impact of incubator and coworking space incentives on job growth across 92 counties in Indiana, although higher in quality, does not do much better in supporting incubators. Using over 40 years of panel data, it found that each new coworking space provided by an incubator yielded an economically insignificant average increase of ~2.3 employees per participating employer. However, it found no effect for incubators specifically (Hicks & Faulk, 2018).

More convincing, albeit disappointing, is the empirical evidence *against* incubators. A 2012 study that conducts a study of firms from 5 German incubators by matching them with 371 non-incubated firms produces the most reliable empirical estimate across any other incubator study available. Over 10 years of analysis, it found no positive effect of any of the incubator models on the survival of firms. In fact, it was found that 3 of the incubators had statistically significant negative effects on long term survival (Schwartz, 2012).

The thin and conflicting empirical evidence about the economic effects of incubators fails to materialize a convincing case for incubators being a net present benefit to the local economy in general. But this is not the whole story. Despite growing attention to the impact of business incubators, the existing literature continues to suffer from the fact that existing performance measures have inherent biases that lead them to underestimate the role of business incubators in entrepreneurship and economic development in economically distressed areas, which typically face disadvantageous local economic conditions (Cheng & Shaffer, 2011). A 2010 paper from West Virginia's Regional Research Institute used data from the NBIA to create a map of over 700 business incubators in the U.S. to gain geographical insights about the distribution of incubators. Authors found that although rural business incubators may face disadvantageous local economic conditions compared to their urban counterparts, existing performance measures may unfairly underestimate their role in rural entrepreneurship and economic development because they fail to measure the outcomes that are uniquely of interest to rural communities (Yu et al., 2010). A 2013 qualitative analysis that examined 80 incubators of different types in Spain (basic research, university, economic development, and private incubator) found that basic research incubators are able to originate a higher number of technological process innovations than university or regional development incubators (Barbero et al., 2013).

While these findings don't make a strong economic case for a business incubator in Pennington Gap, they don't necessarily indicate that other functions of the CT would constitute a net economic drain on the town. Still, it should convey a great deal of uncertainty as to whether the CT would provide benefits with regard to significant local job creation or startup growth. Still, given that the CT is intended to provide Mountain Empire Community College (MECC) with workspace and equipment for some of MECC's technical degree/certification programs, a design for the CT that focuses less on providing startup space for new ventures does not preclude it from being utilized as a benefit for entrepreneurs in terms of innovation.

A Overview of GOTEC in Danville, VA

This section presents a case study of a model that abandons the idea of business incubation altogether in favor of supporting the development of skilled trade labor. While this brief does not explore empirical evidence behind said model, this overview is a necessary first step in the ongoing evidence assembly process.

GOTEC is a collaborative project whose mission is to "…stimulate job growth within the Commonwealth by creating dependable talent pipelines in strategic sectors, fostered through public and private partnerships" (gotecva.org, 2023). Starting with students in middle school and continuing throughout their experience in high school dual enrollment classes and post-secondary programs, GO TEC engages with them to develop into ready to work labor in the sectors of IT, advanced manufacturing, and STEM, developing a talent pipeline for Virginia businesses.

GOTEC 's mission is achieved through the collaborative support of stakeholder groups representing key industry employers, the Virginia Department of Housing and Community Development (DHCD), and educational institutions that coordinate programs and other support to progressively generate the robust talent pipelines across Southern and Southwest Virginia. This project is described as a hub-and-spoke model where middle schoolers are introduced early to the occupations and base skill training in target sectors through exploratory classes, such as a rudimentary coding class, or school-based Career Connections Labs as "spokes." These spokes then feed these students who otherwise may not have been interested in those career fields to high school and post-secondary "hubs" such as career and technical courses, industry certification programs, and dual-enrollment training opportunities with higher education partners.

This project started in 2019 as a partnership among Danville Community College, The Institute for Advanced Learning and Research (IALR), Southside Virginia Community College, the Southern Virginia Higher Education Center, Patrick & Henry Community College and the New College Institute. The director of the IALR coordinated resources in the form of K-12 curriculum training to teachers and specialized equipment from partners and DHCD funding sources respectively, to launch the Career Connections Labs for middle schoolers. The IALR represents the central junction of this partnership because their facilities and staff form the conduit of services, funding, and developing skilled labor shared among the partners.

When it launched in 2019, GOTEC served K-12 and post-secondary partners in just a few counties in the Growth and Opportunity Virginia (GO Virginia) Region 3, such as Charlotte, Halifax, Mecklenburg, Pittsylvania, and the City of Danville. Now the partnership now involves nearly every county in district 3 and one county each in Go Virginia Regions 1 and 4. Currently this partnership is comprised of 14 public school divisions, 10 post-secondary academic institutions, 6 industry partners, 5 economic development partnerships, and 3 state government commissions.

The first phase of this program, which served the counties mentioned in the previous section was supported by $648,000 in direct funding from the Go Virginia Board, but this only represents a drop in the bucket when examining the capital stack of this model because GOTEC's functions primarily rely on the cooperation of publicly funded school divisions or other academic institutions. To determine the magnitude of this layer in the capital stack, one would need to derive the aggregate opportunity cost to participating academic institutions of cooperating in this program. The key insight from this capital stack is that GOTEC's impact emphasizes leveraged partnerships over direct capital infusions.

According to GOTEC, they have contributed considerable economic impacts in Virginia, such as the production of 260 work ready graduates, 1,500 students enrolled in what they call the "talent pipeline", to meet the 984,392 projected job opportunities in GOTEC career clusters by 2026. However, it's important to note that the information on impacts provided by GOTEC is limited in its ability to show what these numbers would look like in the absence of GOTEC. Nevertheless, the GOTEC partnership has been the recipient of numerous awards over its lifetime such as the 2021 Innovation in Education and Community Outreach Award given by the Southern Piedmont Technology Council and the 2019 Gold Summit Award from the Blue Ridge Chapter of the Public Relations Society of America.

Alternatives

Over the course of drafting this report, as I conducted background research and assembled evidence for the evidence review and stakeholder interviews, I became increasingly aware of and concerned by the fact that some of the most crucial stakeholders in this problem ecosystem held disparate visions for the CT and its effect on economic outcomes. It was as if the prospective CT was a crystal ball through which each stakeholder saw a future where the CT would alleviate the economic distress of the region in different ways.

However, after taking a step back from I was able to see a more salient thread of concern among these stakeholders: there are stakeholders representing public and private interests in Pennington Gap and the tri-county area who need professional skilled trades services, such as HVAC, masonry, and carpentry but are not having those needs fulfilled. This realization led me to reframe the policy problem from barriers to entrepreneurship to a skilled trades labor shortage. I believe that this problem reframing was a crucial task because it more accurately reflects the unifying concern among the most critical stakeholders which is pivotal to steering the CT's vision into a strategy that makes the most meaningful economic impact possible.

Crucially, if the CT can table the functions of a relatively costly incubation facility in favor of a lower cost alternative that bolsters a skilled trades labor pipeline from skilled trade development programs at secondary and post-secondary educational institutions to public and private development projects through the CT in Pennington Gap, such an alternative could net benefits for every stakeholder. MECC could benefit from increased enrollment from a robust buildout of its skilled trade programs thorough the development of the CT and LENOWISCO (and potentially the greater GO Virginia Region One or Virginia ARC) could benefit from the increased labor supply output while, most importantly, the town Pennington Gaps consumers and small business owners could benefit from an influx of young skilled laborers flowing through the town's hub that increase the exchange of goods and services that otherwise would not happen, which could positively impact small business growth in the long-run.

After numerous hours of research on public policies to increase local skilled trade labor supply, three alternatives were identified as potential courses of action for the Town of Pennington Gap to pursue in order to effect change on the problem. These alternatives are 1.) for the Town of Pennington Gap to construct and operate a 9-unit business incubator called the **Center for the Trades** (CT) to attract potential skilled trades startup entrepreneurs; 2.) for the town to partner with Mountain Empire Community College (MECC) and Lee County High School (LCHS) to build an **MECC Satellite Campus** that enables increased provision of plumbing, construction, and HVAC training programs in the county; 3.) for the town to implement an **Apprenticeship Network Program** (ANP) that connects employers specializing

in construction, HVAC, and plumbing, with existing skilled trades laborers and graduates from MECC or LCHS vocational education programs specializing in the same or similar areas.

Alternative 0: Status Quo

In order to thoughtfully evaluate the alternatives, there must be a baseline scenario against which those alternatives will be compared. This is Alternative 0 or the Status Quo Alternative. This is what could occur if Pennington Gap were to simply allow its present labor market trends to continue without an explicit intervention. Most importantly this would mean that the Center for the Trades would not be built at all.

Alternative 1: The Center for the Trades with Incubators

Alternative 1 represents an intervention where the Center for the Trades somehow secures full funding to build the Center for the Trades as it was envisioned in the 2022 Feasibility Study. This Alternative can only happen if the Town of Pennington Gap secures full grant funding to carry out the full construction of the CT and if the local government has the capacity to maintain the facilities such that the CT's projected revenue from rents or fees can cover additional capital and operational costs, such as including electric and plumbing utilities, office supplies, and a forklift, for the foreseeable future.

Business incubators, a key aspect of Alternative 1, are facilities that are rented by startup enterprises, often at below market rates, to conduct their businesses in the earliest stages without their firms being as cost burdened as they would be if paying for rental space provided by the commercial or industrial real estate market. Generally speaking, business incubators tend to offer additional benefits and services beyond artificially low rent, such as the costs savings from multiple new firms sharing commonly used equipment (e.g. forklift or accounting software) or financial literacy or marketing classes for tenants with little to no business experience.

The theory behind business incubation leading to economic benefits is fairly straightforward. If startups, particularly those who have been struggling to break even, profit, and ultimately scale up production, choose to startup in a business incubator, then they will be more likely grow at their desired rate because they are spending less resources on capital expenditures and therefore have increased revenue to spend on sustainable growth and/or competitive wages that can draw more skilled labor into the region, thus increasing the local skilled trade labor supply.

While the theory of business incubation seems to have sound logic, a review of existing literature on the economic effects of business incubators reveals that the empirical evidence behind this theory is not so promising. While a few papers show very limited positive effects of business incubation on employers' employment rates, these effects are not very reliable and a longshot from proving that incubators *cause* any change in employment (Madaleno et al., 2021; Hicks & Faulk, 2018). In other words, while some business startups take advantage of business incubation and scale up to provide a positive economic impact, this does not necessarily mean that these businesses would not have been able to scale up without an incubator. Alarmingly, a few studies in Europe that measured the impact of incubators on firm survival found that when compared with tenant firms not using incubators, firms using incubators are less likely to survive in the long run (Lukes et al., 2019; Schwartz, 2012). While all of these findings paint a dismal outlook for a CT that is incubator focused, some incubator programs do see success, such as the Small Business Incubator in Abingdon, VA, or Youngstown Business Incubator in Ohio, suggesting that some there could be something adjustable about incubators or the environment in

which they operate that can make them successful if adjusted appropriately. A key difference between the Town Pennington Gap and the localities of these other incubators is that those localities are not nearly as economically distressed as Pennington Gap. Thus, these incubators may primarily be sustainable and impactful due to the existing economic conditions of the localities in which they operate. Undoubtedly, the great deal of uncertainty as to whether the CT would provide significant local job creation or startup growth must not be ignored.

This alternative entails the full construction of 9 incubator units that are 30 ft wide by 30 ft long with an administrative and classroom facility that is approximately 2,000 square feet. The two structures would be separated by a 13 ft wide forklift alley. Further details regarding the specific design elements and construction cost of the CT are provided in pages 8-15 of the 2022 Feasibility Study (See Appendix A). This alternative also entails the ongoing operation of the incubator. This would require at least one to two administrative staff, perhaps a director and assistant director, or a director and custodian, to ensure that the tenant firms' needs are being met and that facilities are adequately maintained. Administrative staff would also design and implement programs intended to provide technical assistance or teach skills vital to their capacity to operate as profitable enterprises. This could include inviting working and retired trades people from nearby or similar counties to share their perspectives on succeeding in business or hosting a workshop on how to utilize financial software to run a business.

Alternative 2: The MECC Trade Satellite

Alternative 2 would be a variation on the vision of the CT established in Alternative 1. The primary difference would be that the facility's vision would shift its focus away from being a facility that primarily promotes small startups and instead partners with HVAC Technician, Construction Trades, Plumbing, and Advanced Manufacturing Programs at Mountain Empire Community College to occupy what would have been incubator spaces. This would transform the CT into a satellite campus for Mountain Empire Community College. Much like Alternative 1, the possibility of this Alternative 2 is conditional upon the endowment of a federal, state, or philanthropic grant to fund the full construction of the facility. Also, Alternative 2's operation is also contingent upon MECC's commitment to expand or relocate these programs to Pennington Gap and shouldering the cost of operating and maintaining some or all of the facility.

Crucially, Alternative 2 should expand MECC's capacity to produce skilled graduates from the mentioned programs, thus increasing the supply of local skilled trades labor. As a secondary effect, the expansion of this sectoral labor pool would alleviate the labor shortage concern for aspiring entrepreneurs in the area as well as firms considering Pennington Gap as a location more broadly. Additionally, this could potentially stimulate enrollment in these programs at MECC and magnetize high school and community college students to local businesses in Pennington Gap, thus drawing more customer payments into Pennington Gap's economy, such as at restaurants or local retail shops, that are not expected to happen if the Town maintains the Status Quo policy.

Generally speaking, Alternative 2 represents an attempt to move the needle on the skilled trades labor supply through an investment in vocational education. There is a limited but generally positive research base suggesting that vocational education can have generally positive economic benefits (Terentyeva et al., 2018; Samoliuk et al., 2021). More importantly, there is strong evidence that enrollment in these programs can increase the likelihood that a student eventually gains employment in the sector aligned with their vocational training (Malamud & Pop-Elches, 2010; Brunello & Rocco, 2017). Moreover, there are few examples of quasi-

experimental evidence that suggest participation in vocational education programs intended to get participants employed in a particular sector increases the likelihood that participants earn higher wages as well (JPAL, 2022; Brunner et al., 2023; Chamadia & Mubarik, 2021). However, to accept that the evidence behind the benefits of these programs translates to a positive outlook for Alternative 2, Pennington Gap would need to ensure that the administrator of this program encourages participants of these programs to enter and hopefully remain in the local skilled trade labor pool, rather than relocating after graduating from such programs.

Alternative 2 would involve a construction process similar to the one mentioned in Alternative 1. The key difference would be that instead of constructing 9 identical incubator units, the project would create only enough space to house the 4 total programs. While this could feasibly reduce the total construction costs, equipment costs would likely increase as the 4 programs would need to be supplied with the appropriate equipment. The administrative building would include appropriate classroom space for those programs as well as at least 1 or two administrative and or custodial staff to maintain the facility. This alternative is similar to Alternative 1 in that it would still include an administrator who designs and implements skills programing. However, in this scenario, programs could be designed with a broader range of themes in mind. While the previous alternative is limited to programming that is intended to equip entrepreneurs with business related skills, Alternative 2 could include job obtainment classes on marketing oneself to potential employers. Alternative 2 could simultaneously serve the Careers in Technical Education Programs at Lee High School by giving students an opportunity to explore potential career pathways that could be very rewarding. Above all, the administrative role would be designed to organize and oversee these services to maximize this alternative's capacity to benefit the local community. As it was envisioned in Alternative 1, the administrator would also ensure that all of the facilities are maintained.

Alternative 3: Apprenticeship Network Program

Alternative 3 is the most unique among all of the alternatives because it abandons the notion that Pennington Gap must rely on a substantial revenue injection to move the needle on economic outcomes. This alternative would represent a scenario where Pennington Gap organizes the resources already at its disposal to connect existing trades service laborers and employers specializing in Construction, HVAC, and Plumbing, with graduates from MECC or High School CTE programs specializing in the same or similar areas, into an apprenticeship network. This apprenticeship network would be designed to provide recently qualified or unemployed skilled workers with employment and on the job training while also getting paid by current employers.

The theory behind this alternative is that if this program can connect a portion of the current pool of skilled trades labor employers to young driven workers with a desire to work, this would accelerate the growth of the local skilled trade labor pool, ultimately expanding access to the services for locals in Pennington Gap and the surrounding community, either through the participating employers' increased capacities to deploy their services or through the increased likelihood that some of these workers will enter the market as service provider.

Essentially, this program targets the problem of skilled trades labor shortages head on by generating new trades jobs through private partnerships to oversee apprentices. There is experimental and quasi experimental evidence suggesting that apprentices are much more likely to be employed than vocational students and temporary workers and provide increased benefits

to participating firms (Cahuc & Hervelin, 2020; Picchio & Staffolani, 2017; Crepon & Premand, 2018).

This alternative is the simplest approach behind the Status Quo because it does not entail the creation of a facility and could be organized with fewer local government resources. To fully implement this alternative, the Town of Pennington Gap would need to establish a role for operating this network. The town would fulfill this role either by reallocating an existing human resource from the town government office to organize and maintain this network or by creating a new position altogether and paying an additional cost to employ a qualified candidate. Regardless of how the local government fulfils this role, said employee would be responsible for locating as many of the existing firms who employ skilled trade laborers in the tri-county area as possible, if not all. This program administrator would advocate that these employers be willing to participate in the apprenticeship program and arrange a contract between employers and prospective apprentices that both parties find agreeable. The program administrator would also need to oversee the strategic monitoring of these apprenticeships to ensure that employers and laborers are compliant, as well as to track short and long term outcomes to evaluate program efficacy.

Criteria

To recommend the optimal alternative, there must be a systemic way of comparing their projected outcomes with respect to criteria that reflects the values embodied in Pennington Gaps desire to do something that provides skilled vital trades services to community members in need of them. The following analysis will weigh projected outcomes of the alternatives against the three highly consequential criteria. These criteria are the Net Present Value of each alternative's projected outcomes to Lee County; the Administrative Feasibility of each desired outcome being produced by the relevant actors through implementation of each alternative, and Fundability, the likelihood that each alternative can obtain grant, private, public, and/or philanthropic funding to be implemented and ultimately produce the desired outcomes.

Criterion 1: Net Present Value

Net present value is a criterion that captures the economic value reflected in the Town's determination to improve the local economy. While any alternative beyond the status quo will initially present economic costs to the town, they should produce outcomes where the town also reaps economic benefits. These costs and benefits must be systematically quantified and monetized through a benefit-cost analysis in order to derive a net present value of each alternatives' projected outcomes. This derived net present value is crucial as a decision making criteria because it will suggest which alternative outcomes could provide the greatest net benefit or net cost to the region, ensuring that the ultimately recommended alternative is the most effective in producing economic benefits through the growth of the skilled trades service provision. This criterion will favor alternatives whose projected outcomes provide economic benefits in dollar values that outweigh the upfront and ongoing costs associated with the implementation of these alternatives.

Criterion 2: Fundability

Regardless of which policy alternative is ultimately recommended and chosen as the best course of action for addressing the problem, Pennington Gap will have to shoulder the cost of

implementing the alternative in some way. The possibility of implementing some alternatives solely hinges on whether or not these alternatives can obtain grant funding from a variety of government, public, and private sources, while the possibility of implementing others rely less on a huge injection of capital funding but still require a financial commitment to maintain its function. This circumstance justifies the inclusion of a Fundability Criterion in this analysis.

Since the pool of potential funding sources is so broad, it would be impossible to consider the criteria for every single funding opportunity to determine overall how fundable a given alternative would be with respect how it would stand out to potential funders in a grant proposal. To simplify the operationalization of this criterion, each alternative's fundability will be judged based on its alignment with the comprehensive or strategic plans of key competitive grants from the following institutions: the Appalachian Regional Commission which oversees the POWER grants for the Appalachian region, the GO Virginia Fund, and a Community Development Financial Institution called Invest Appalachia. Additionally, fundability will be judged based on the ability of Pennington Gap to pay the operational costs of implementing an alternative regardless of the upfront capital costs. Accordingly, an alternative that aligns with the strategic plans of every listed potential funding source and also requires low operational costs would be considered highly fundable relative to alternatives that are misaligned or require higher operational costs.

Criterion 3: Administrative Feasibility

Even if a given alternative could produce an outcome that completely solves the policy problem and has the highest likelihood of attracting outside funding, Pennington Gap must evaluate its capacity to implement said alternative with the resources at their disposal, otherwise known as Administrative Feasibility. To measure outcomes against this criterion the following analysis will judge the administrative feasibility of alternatives on a scale of high, medium, or low by considering the following factors: 1.) the number of stakeholder organizations that the town needs to organize to implement the alternative; 2.) the ability to allocate human resources to maintain the alternative; and 3.) the complexity of the process between the recommendation of the alternative and the beginning of the alternative's functional implementation.

Regarding the first factor, if one alternative requires cooperation among the town government, county government, and multiple educational institutions that would suggest a lower rating of administrative feasibility for that alternative because the town would have to expend more resources to pull off coordination, such as by organizing more meetings. This rating would also be appropriate, considering the second factor, if this alternative requires the town to recruit four new employees rather than reallocating existing local government employees because finding qualified candidates would take a greater effort. Finally, with respect to the third factor, this alternative might have low administrative feasibility if a multi-year long construction project must occur before the facility can even operate because this period of planning, design, and construction would require the town to expend more resources that are already spread thin. If a given projected outcome is measured as high (3) medium (2) or low (1) on each factor, then the average rating can represent administrative feasibility. For example, if alternative x receives a score of high administrative feasibility on factor 1, low on factor 2, and medium on factor 3, then the total administrative feasibility rating would be medium.

Projecting the Outcomes

The desired outcome of each alternative, that is increasing the supply of skilled trades labor, must be achieved through the three stage process identified below.

The first stage, Funding, is the most pivotal. The first two alternatives can only advance to implementation only if they are all or mostly funded through a grant from government agencies such as the Appalachian Regional Commission (ARC) or the GOVirginia Fund, or another source of capital such as the CDFI, Invest Appalachia (IA). These sources of funding will only sponsor the alternatives if the alternatives align with certain criteria informed by local and regional comprehensive plans (See Appendix for criteria). The following analysis will assess the alignment of alternatives with the funding criteria from two government organizations and one CDFI to produce a composite score to represent the **fundability** of the alternatives. For example, if Alternative 1 is perfectly aligned with the criteria of two different funding sources but only somewhat aligned with the criteria of the other, the fundability score would compute as follows:

Let 3 = perfectly aligned, 2 = somewhat aligned, 1 = tangentially aligned, 0 = not aligned

Alternative 1 Composite Fundability Score = 3 + 3 + 2 + = 9 (Highly Fundable)

The second stage, Implementing, is where the action happens. Regardless of which alternative could garner the most funding or produce the most significant outcome, the capacity of local and regional stakeholders to coordinate and sustain a given alternative, or the **administrative feasibility** of the alternative must factor into the final recommendation. The following analysis will determine the administrative feasibility of each alternative by quantifying the following factors: 1.) the number of stakeholder organizations that the town needs to organize to implement the alternative; 2.) the ability to allocate human resources to maintain the alternative; and 3.) the overall complexity of the process between the recommendation of the alternative and the beginning of the alternative's functional implementation. By quantifying each of these factors on a 0-3 point scale for a given alternative, much in the style of assessing fundability, and adding them together, the score will represent the administrative feasibility of the alternative.

The third stage, Impacting, is where a given alternative yields measurable effects on the skilled trades labor supply. This impact will likely look different depending on which alternative is ultimately recommended and implemented so each of the potential outcomes should be evaluated for their expected **economic value**. To ascertain the economic value of each outcome, this report will employ a cost-benefit analysis of each alternative. A cost-benefit analysis will identify and monetize the costs of designing, building, and operating each alternative over ten

years and monetize the benefits of skilled trades labor changes to the region. This analysis will only estimate costs and benefits of each alternative to the town government of Pennington Gap, and the producers of skilled trades labor in the tri-county area. By monetizing and projecting costs and benefits of each alternative and discounting them to their present values, this analysis will estimate the net present values (NPVs) of each alternative which will be a positive or negative dollar value representing their economic values.

What Would Happen if Pennington Gap Allowed Present Trends to Continue?

Alternative 0 pertinent to this analysis because allowing present trends to continue will produce the economic effects against which the other alternatives will be compared. For this reason, the only criteria relevant to Alternative 0 is economic value. To determine the economic value of allowing present labor market trends to continue, this analysis will rely on a few key assumptions. The first assumption is that the current unemployment rate for Virginia is 3% and the current unemployment rate for Lee County is best represented by the unemployment rate for the tri-county area (Counties of Lee, Wise, Scott, and the City of Norton) which is about 3.8% of the total working population (BLS, 2023). The Pennington Gap or Lee County unemployment data is not used because regional estimates are generally more accurate than town or county-level estimates. The second assumption is that over the next ten years these unemployment rates for both Virginia and LENOWISCO will remain constant. This assumption is reasonable because unemployment rates do not tend to fall lower than 3% because at least 3% of working aged people could be between jobs at any given time (Lahart, 2022). There are also no convincing signs that the region is expecting a shock that would increase unemployment within the next ten years. Bearing these assumptions in mind, this analysis reveals that allowing present trends to continue will generate no economic impact to the region and therefore has a net present value of $0.

What Would Happen if Pennington Gap Pursued the Center for the Trades?

Funding

If the Town of Pennington Gap decides that the Center for the Trades should be a facility focused on business incubation, what is the likelihood that the town could obtain grant funding to support all or most of its construction? To answer this, the vision for the CT would need to be compared to the investment priorities of IA, the grant scoring criteria of the GO Virginia program and ARC's POWER grant program. The CT's vision is undoubtedly aligned with at least three out of five strategic priorities of the ARC POWER initiative: Building Appalachian Business, Building Appalachia's Workforce Ecosystem, and Building Appalachia's Infrastructure. While budgetary projections and collaborative partnerships will be required for the application process, a grant proposal's alignment with strategic priorities is the most important criteria for the ARC to consider. Notwithstanding the funding criteria pertaining to administrative or fiscal capacity, Alternative 1 should be considered highly fundable with respect to the ARC POWER initiative. While the ARC's POWER application puts relatively little emphasis on the projected capacity of the applicant and outcomes of proposed projects, the GO Virginia Foundation puts a heavy emphasis on these aspects. At least 35% of GO Virginia's funding criteria is dedicated to the projected economic impacts for a given project. As the cost-benefit analysis for this alternative will demonstrate, this alternative is not projected to generate a return on investment and would therefore disqualify the project from being funded though GO

Virginia. IA puts a similar emphasis on investment returns as well. According to its strategy, IA does not tend to award grants to small business development projects, favoring investment making instead, although exceptions have been made. Generally speaking, when IA considers projects for grants, they care more about economic impacts than return on investment, and care more about returns on investment when considering projects for investments. Since Alternative 1 is projected to produce neither returns on investment nor positive economic impacts, it would not likely be funded by GO Virginia or IA. Taken altogether, Alternative 1 is not very fundable.

Implementing

To determine the administrative feasibility of Alternative 1, this analysis considers the Town of Pennington Gap's degree of collaboration with stakeholders required to carry out the CT, current human resource capacity, and the complexity of the implementation process up to the point where the CT can actually start leasing incubator units. Before the CT could even be constructed, the Town of Pennington Gap would need to coalesce a list of stakeholder groups to support the project including but not limited to a minimum of 3 committed trades entrepreneurs, the LENOWISCO Planning District Commission, prospective capital investors to meet funding requirements, companies to design and develop the facility, as well as town and county council members to endorse the project for funding opportunities. The CT would require deep involvement from each of these stakeholder groups throughout the development process. The Town Manager of Pennington Gap believes that allocating its human resources to carry out this project is of relatively little concern. The complexity of implementing this alternative is of particular concern. One exemplar incubator feasibility study identified more than 35 different activities, some sequential and others concurrent, needed to be completed before opening a business incubator (See Appendix). While Pennington Gap may not follow the same exact path, even half of these steps, in addition to the steps it would take to apply for grant funding, would constitute a very complex implementation process for the CT.

Impacting

Among all of the alternatives, Alternative 1 is the costliest course of action. In 2022, the Hill Studio estimated that the construction of the CT ala the Feasibility Study would cost $4,555,824. Even after adjusting this cost based on the producer price index (PPI), the cost is still high at $4,218,355.56. In addition to the construction cost, Pennington Gap would also need to supply the facility with some basic equipment, such as furniture, a forklift, or a photocopier. This combination of upfront construction and equipment costs will represent the total upfront costs of Alternative 1 which would be about $4,318,355.56 altogether. Operational cost will represent the annual costs of running the business incubator, which will include utility costs, the cost of employing or promoting someone to run the incubator as well as employing a custodian. This analysis assumes, based on previous grant applications, that the town manager's administrative assistant, Jeannie Stidham, would take on the additional responsibility of running this facility. Thus, instead of using an additional full salary in this cost estimate, the analysis will assume that this cost is reflected in a $20,000 salary increase. Operational costs in this analysis will not include the cost of supplies that will need to be replenished on a regular basis, such as printer ink, light bulbs, etc. because Pennington Gap will expect tenant firms to pay for their own supplies. Some of these annual costs will scale up with occupancy (i.e. utilities and custodial costs) while others, such as administrative salary, will remain constant.

To balance the cost of running the incubator, Pennington Gap will need to produce revenue by leasing these incubators to prospective businesses. Using an estimate from an exemplar incubator feasibility study adjusted for inflation, this annual lease rate should be about $19,818. This analysis also assumes occupancy will scale by 3 incubator occupants per year until it reaches full occupancy at nine leases (i.e. 3 leases in year 1, 6 in year 2, maximum 9 in year 3). This analysis generously assumes, based on the most promising literature, that each occupied incubator would equate to 2 additional skilled trades workers supplied in the LENOWISCO market (Place Dynamics, 2012). To monetize this benefit, this analysis takes the average annual wage of skilled trades workers in the LENOWISCO area and subtracts from it the annual wage of these workers if they were working a full time minimum wage job. This wage differential will represent the monetized benefit per skilled trades job added through incubation.

After projecting the costs and benefits over 10 years and discounting them to their present values, this alternative would be expected to produce a net economic cost of roughly $784,968.77. While a reasonable person might be concerned that the assumptions upon which this analysis is based may deviate from true parameters, this is of little concern because the net present value of Alternative 1 is less than $0, even when these assumption favor a high level of expected benefits.

What Would Happen if Pennington Gap Constructed an MECC Satellite Campus?

Funding

With regard to the POWER grant, Alternative 2 is just as fundable as Alternative 1 because it aligns with the ARC's strategic initiative of Building Appalachia's Workforce Ecosystem through investments in education. Relative to Alternative 1, the likelihood of securing funding from the GO Virginia Foundation is much higher because, at least in this case, there would be an expected net economic benefit to the tri-county area. Furthermore, an MECC satellite campus would satisfy most of their other criteria, such as leveraging regional partnerships and being sustainable. The only criteria that the project would not be able to satisfy as of 2024, is the Project Readiness criteria. However, this is of little concern because this shortcoming could only be corrected after the recommendation of this analysis. Securing funding for Alternative 2 from IA would not be as likely. While there would be an expected net economic benefit resulting from Alternative 2, this project would be far too expensive to be considered for grant funding, as IA typically reserves grant funding for smaller capacity building initiatives. IA would also not be interested in Alternative 2 as an investment, because returns would not accrue to IA, but rather to the community. Still, as Alternative 2 is perfectly aligned with the criteria from two of the three funding sources, it is relatively fundable.

Implementing

At first glance the administrative feasibility of Alternative 2 seems to be on par with that of Alternative 1. Both alternatives generally require a great deal of collaboration with a variety of community stakeholders. However, the key difference between these two alternatives is that the Town of Pennington Gap will not bear as much responsibility for organizing stakeholders as MECC will. Alternative 2 only expects Pennington Gap to build the facility and shoulder the utility costs of the satellite campus. According to MECC's Dean of Industrial Technology, MECC would be responsible for operating and maintaining the facility. This means that the Town of Pennington Gap would not need to concern itself with human resource allocation. This

would also mean that, unlike it would for Alternative 1, the town would not need to develop materials such as policy manuals, incubator organizations, or lease agreements. This difference simplifies the process between recommendation and the operation of the facility by MECC, leaving Pennington Gap only responsible for organizing stakeholders to apply for funding as well as design and construct the facility (i.e. MECC, a designer, and a builder). Thus, this analysis deems Alternative 2 to be very feasible.

Impacting

Alternative 2 is not as costly as Alternative 1, but still so expensive that its implementation would be contingent upon whether or not it could be funded by an outside source. To estimate the upfront cost of building the trades satellite this analysis adapts the cost estimates from Alternative 1 based on the Feasibility Study. MECC's Dean of Industrial Technology estimated that this Alternative would only need a facility the size of four incubator units to work. Thus, it is reasonable to assume that the cost of building five incubator units could be subtracted from Alternative 1's inflation adjusted construction cost to estimate Alternative 2's total upfront cost, which is $2,960,639.51. Since the Town of Pennington Gap would only be expected to pay for utilities, while MECC would shoulder every other cost, operational costs would only be the annual utility cost per incubator unit times four, or $15,664.80 per year.

To monetize expected benefits, this analysis assumes that those who enroll in and graduate from the additional trades programs made possible by MECC's Satellite Campus would otherwise be earning a minimum wage salary. This wage increase would represent a $19,252.65 benefit per additional skilled trades labor. According to MECC's Dean of Industrial Development, this would enhance MECC's enrollment capacity by 20 skilled trades program slots. This analysis cautiously assumes that at least 50 percent of graduates would stay in the LENOWISCO region. Multiplying these factors together yields an estimate of benefits in terms of the wage increase for those expected to remain in the region in 2027, the first year that a skilled trades cohort is expected to graduate. This amounts to $192,526.45 in benefits for 2017. Assuming that the salary increases hold constant for each consecutive year and cohort, his benefit increases by an additional 20 times per year. The accumulated benefits over ten years will represent the economic benefit.

After projecting the costs and benefits over ten years and discounting them to their present values, the MECC Satellite Campus would produce a net economic benefit of roughly $3,896,139.03. Looking at how the net cashflows accumulate year by year, the Satellite campus would produce a net benefit that exceeds the grant cost by 2032.

What Would Happen if Pennington Gap Established an Apprenticeship Network Program?

Funding

If the Town of Pennington Gap decides to establish an Apprenticeship Network Program, what is the likelihood that the town could obtain grant funding to support the startup and operation of such a program? In other words, how does this alternative measure up to the investment priorities of IA, and the grant scoring criteria of the GOVirginia program and ARC's POWER grant program? This program's vision is aligned with at least two out of five strategic priorities of the ARC POWER initiative: Building Appalachian Business and Building Appalachia's Workforce Ecosystem. Consequently, Alternative 3 should be considered highly fundable with respect to the ARC POWER initiative. The likelihood of securing funding from

the GO Virginia Foundation is also quite high because there would be a considerable expected economic benefit to the tri-county area. Regarding its other criteria, the Apprenticeship Network Program would satisfy all of their other criteria, even the Project Readiness criterion because this project would not involve the construction of a building. Securing funding for Alternative 3 from Invest Appalachia is also promising. As mentioned above, IA typically reserves grant funding for smaller capacity building initiatives. Since the only costs of this alternatives are an additional salary and a modest cost to employers, and the additional jobs created would accelerate other economic development projects in the region, it is reasonable to predict that this project would be highly attractive to IA. Since Alternative 3 is perfectly aligned with the criteria from each of the three funding sources, this analysis deems the Apprenticeship Network Program to be highly fundable.

Implementing

Of all the alternatives, the Apprenticeship Network Program is the most feasible option. While Alternative 3 requires some degree of collaboration with community and regional employers and large scale contractors as well as qualified laborers, this degree of collaboration is modest relative to the other options. Alternative 3 does not require any facility construction. If the Town of Pennington Gap chooses to hire a salaried employee to take on the responsibility of implementing this program, then it would not need to concern itself with human resource allocation at all. If the cost is too much to bear, then the Town of Pennington Gap could potentially rely on current employees to carry out this program cooperatively. Overall, this analysis does not detect any doubts about Pennington Gap's ability to delegate this responsibility appropriately. However, the process between recommendation of this alternative and the operation of the Apprenticeship Network program is moderately complex. This program would need to assist in developing contracts between employers and apprentices, which could be costly enough to outweigh any inherent incentives for employers. Taking all of these factors into account, Alternative 3 is still very feasible.

Impacting

Alternative 3 is the least costly alternative by far. This analysis assumes that the annual costs of this program to relevant agents would equal the additional cost of salary to run the program plus the annual cost to producers participating in the apprenticeship program. This analysis estimates the annual salary and benefits cost to be about $50,000, which is an upper bound estimate that gives the client flexibility to create two lower paying or part time positions. This analysis also assumes that the annual cost to employer per apprentice taken on is about $2,500. Assuming that an average of five new apprentices are taken on by various local employers per year, this annual cost amounts to 62,500.

The benefits of Alternative 3 are simply monetized as the additional salary earned per skilled trades worker employed through this program. This analysis assumes that one new apprenticeship will be created per year after the initial five are established in 2025. By multiplying the salary differential by total number of apprenticeships the benefit in the first year is $96,263.23 and it increases annually by an additional $19,252.65 each year.

After projecting the costs and benefits over ten years and discounting them to their present values, the Apprenticeship Network Program would produce a net economic benefit of roughly $1,072,942.13. While this program has a net present value less than one third of the

MECC Satellite Campus, the Apprenticeship Network Program's benefits would offset costs at a moderately higher rate.

Outcomes Matrix

	Economic Value (NPV)	Fundability (0-9)	Administrative Feasibility (0-9)
Alternative 0: Status Quo	$0	N/A	N/A
Alternative 1: Center for the Trades	- $784,968.77 BCR: .84	(3+0+0) = 3 (Not very fundable)	(1+3+1) = 5 (Somewhat feasible)
Alternative 2: The MECC Trade Satellite	$3,896,139.03 BCR: 2.26	(3+3+0) = 6 (Quite fundable)	(2+3+3) = 8 (Very feasible)
Alternative 3: Apprenticeship Network Program	$1,072,942.13 BCR: 2.52	(3+3+3) = 9 (Highly fundable)	(3+3+2) = 8 (Very feasible)

Recommendation

Assuming that Alternative 2, the MECC Satellite Campus could secure the funding and support needed to successfully produce skilled trades labor, it would certainly produce the greatest net economic benefit out of the three alternatives. The Center for the Trades on the other hand has a net present value so low that it would end up being a net drain on the town's resources. This analysis concludes that even doing nothing, or letting present trends continue, would be a wiser choice than embracing business incubation at this time. However, given that the MECC Satellite Campus is only the second most fundable alternative, it is important to note that in the event that Alternative 2 cannot be funded, Alternative 3 would be the next best course of action. This is because Alternative 3 still has a positively high net present value, is just as feasible as Alternative 2, and the most fundable of all alternatives.

Considerations Moving Forward

If the Town of Pennington Gap carries forward with supporting the MECC Trade Satellite, it may be helpful to explore how similarly distressed localities have executed polices

that involve leveraging community partnerships to build such a facility. Just in 2023, the ARC awarded $1.5 million to Mountwest Community & Technical College in Cabell County West Virginia to develop skilled trades programs.

The execution of the recommended alternative, the establishment of an MECC Satellite Campus, will occur along the same three phases from which the criteria were derived: Funding, Implementing, and Impacting. The following is an example schedule that projects the timing of key tasks throughout the course of all three phases of execution.

Phase 1: Funding (Months 1-6)

1. **Assemble Relevant Stakeholders:** The Town of Pennington Gap should coalesce representatives from organizations related to the implementation and impacts of the Satellite Campus into a working group that meets on a mutually determined basis. This group should include representatives from the following organizations:
    - Pennington Gap Town Council
    - The Dean of Industrial Trades, Board of Visitors, or Chancellor of MECC
    - Lee County Board of Supervisors
    - Local construction trades businesses
    - LENOWISCO Planning District Commission
    - Lee High School (Related Careers in Technical Education Programs)
2. **Divide Responsibilities:** The working group should collaborate to identify exactly which aspects of the Satellite Campus will be sustained by each organization during each phase. Key aspects to identify would include who will be providing utility costs, who will apply for funding, which architecture firm will design the building, etc.
3. **Facility Design and Construction:** A stakeholder identified by the working group will coordinate with an architect to design the facility and present it to the working group for approval. The working group will then select a building contractor and develop a timeline for constructing the facility.
4. **Grant Application:** The Town, in collaboration with MECC, will identify and apply for relevant grants. The evidence of the policy problem and effectiveness of solutions, as well as fiscal projections from this report should be included in the narrative sections of these grant applications. The town should at least apply for the following grants:
    - Appalachian Regional Commission POWER Grant
    - GO Virginia Foundation Economic Development Grant
    - Tobacco Commission Southwest Virginia Program Grant
    - Appalachian Community Capital Grant
    - Any other potential funding sources for which MECC should be the primary applicant (i.e. funding from state or federal department of education)

Phase 2: Construction and Launch (Months 7-24)

1. **Construction Management:** The working group will assign an individual or multiple members to oversee the selection of a qualified contractor based on competitive bids. This same body will conduct regular progress meetings to ensure that the project stays on schedule and within budget.

2. **Equipment Procurement:** MECC will develop a list of necessary equipment to furnish the MECC Satellite Campus:
    - Trades related instructional tools.
    - Computer hardware
    - Other industry specific technology
3. **Marketing and Recruitment:** MECC will launch a marketing campaign targeting:
    - High school students who are nearing graduation or recent GED recipients
    - Individuals employed locally who are seeking career changes
    - Unemployed residents who are seeking to work in construction trades
4. **Faculty Recruitment:** MECC will recruit qualified instructors for the newly expanded programs through collaboration with:
    - Regional trade associations.
    - Trades specific professional organizations
    - Existing human resource staff at MECC

Phase 3: Impacting (Year 3 onwards)

1. **Program Evaluation and Improvement:** MECC will establish a system for ongoing program evaluation that tracks data including but not limited to:
    - Student completion rates
    - Job placement rates
    - Employer satisfaction surveys
2. **Maintaining Partnerships:** Regular communication between the Town, MECC, and local employers is crucial. Quarterly meetings can be held to discuss:
    - Employer and local industry changes
    - Challenges to increasing enrollment
    - Transportation issues
    - Barriers for trades students, such as the lack of childcare
    - Appropriate strategy adjustments (ex. if childcare access presents a barrier to maximizing enrollment, perhaps find a community partner that can provide childcare near the campus)
3. **Seeking Continued Funding for Potential Expansion:** Finally, if this alternative contributes to job growth as anticipated, it may be worthwhile to consider an additional program for the satellite campus that specializes in equipping students with entrepreneurial or accounting skills to stimulate startup growth. The working group may want to continue meeting throughout this phase to identify funding sources they can take advantage of in the future to enhance the satellite campus in ways such as this.

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