

Towards an Industry-Driven, Student- and Worker-Centered Vision of Career Pathways in Pennsylvania

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Summary of Key Findings

The Commonwealth of Pennsylvania commissioned this study to identify ways the state can support the development of strong career pathways statewide. To address this question, the Keystone Research Center conducted over 50 interviews with members of the career pathways and youth committees of the Pennsylvania Workforce Development Board, local workforce development board directors and staff, K-12 and post-secondary educators, and managers of career pathways programs, including pre-apprenticeships and apprenticeship programs.

A shared broad understanding of career pathways exists in the field. At the outset of the study, a perception existed that educators, trainers and other workforce practitioners use the phrase career pathways in a variety of different ways, and that there is no common definition or understanding of pathways purposes and benefits. The interviews revealed that most applications of the concept of career pathways do fall within a broad common sense definition—i.e., an occupational progression that leads towards family sustaining employment, tied to a sequence of education and/or training offerings that enable participants to develop skills required to advance. In some cases, the education and training lead to industry recognized credentials as well as academic credit. In addition, career pathways in practice tend to offer multiple “on ramps” and “off ramps”—they are not rigid routes to good jobs but allow participants to access education and career advancement at whatever points and for however long those jobs serve participants’ interests and/or needs.

Distinct applications of career pathways exist for K-12 school students, adults, and populations with barriers. Distinct applications of career pathways associate with different age groups and categories of workers. Early K-12 education offer career exposure and exploration more than career pathways, allowing students to learn about the great variety that exists in jobs and careers, and examples of how what they learn in the classroom gets applied in the real world. As students progress in high school, they enter more genuine career pathways programs. Towards graduation these become, in some cases, more tightly connected to employers, industries, and specific occupational progressions.

Beyond high school, in Adult Basic Education (ABE), a pioneer in the development of career pathways, those pathways aim to integrate academic education with occupational training so that participants can acquire, in many cases, a GED, improve their basic skills, AND increase their chances of securing a job that is the first step on a ladder not a dead end. For other populations with barriers—e.g., returning citizens—career pathways, as with ABE, seek to integrate services that address the group’s specific barriers with skills training that gives participants a chance to get a job that could lead to a family supporting wage.

In a growing number of occupations for a variety of age groups, and for workers with and without barriers, career pathways in education connect tightly to job and advancement opportunities in the labor market, and also lead to both industry recognized credentials and academic credit.

High-quality career pathways connect education and training to the real world and to jobs, yielding motivational, learning, and employment payoffs. All the applications of career pathways have in common an effort to connect education and training more deeply to the world of work, overcoming a separation with historical roots in the formation and scaling of high-volume U.S. manufacturing from the late 1800s to about 1980. Over that century, early in which mass schooling began, Americans took for granted, especially in retrospect and from the 1950s to the 1970s, a sequential not interwoven view of education and work: life started with schools—K-10 or -12 for working people, college for the professions and some managers—and was followed by decades of employment. White men often landed a one-company career by some point in their twenties. This oversimple story about education

followed by work got a new lease on life because of the divergence in wage trends for college and non-college workers in the late 1970s and early 1980s, focusing the energies of the most privileged third of Americans—and hence of our schools—on getting their children into college.

What all the applications of career pathways also have in common is a conviction that better connecting education and training to the world of work makes sense for individuals, for employers, for our economy. Strengthening this connection is good pedagogy. Most students, even those at the top of the class who thrive without linking classroom learning to its real-world application, gain motivation, engagement, and intellectual curiosity from understanding how their math, writing, and other skills get used to build our economy and society. Most students, in fact most people, also learn most things by doing them, sometimes with a little help from their friends, not by understanding the theory of how to do them. (In his late sixties, my father, a physicist, tried to learn both wind surfing and downhill skiing on cross-country skis (don't ask) by thinking through the interplay of forces involved. He never became very good at either sport.) Work and experiential learning are especially important to individuals who are bored or lack confidence in traditional classroom-only approaches—whether in grades 10-12 or classes for adults seeking a credential (e.g. a GED) or a job. Further, many interviewees suggested that work-based learning better develops “21st century” skills that employers today most prize—communications, social skills, problem-solving, etc.—skills which also increase workers' resilience and adaptability. Work-based learning does this for the simple reason that many 21st century skills are used much more in the workplace—in the context of accomplishing practical tasks a business needs done—than when completing classroom assignments divorced from any practical application. Two last advantages of connecting education and training to jobs and careers: better employment outcomes—less joblessness, higher compensation, greater advancement—for individuals, and a more productive and stable workforce for employers.

To sum up, the message from our interviews regarding the meaning of career pathways is that Pennsylvania educators, trainers, and workforce practitioners are more on the same page—or at least in the same chapter—than they realize. The field of career pathways in Pennsylvania is primed to focus not on terminology but on doing good work. In the words of one CEO, “the concept of career pathways—people are aware that they are on a journey to a living-wage career—is a really great idea. We just need to get on with it.”

Substantial high-quality career pathways work exists in Pennsylvania. The amount of high-quality career pathways activity in Pennsylvania today (prior to COVID 19) is impressive. By way of comparison, in 2018, leaders of the most prominent career pathways learning network in the country published a book with five case studies aimed at making the concept of career pathways concrete. Fully profiling all the good career pathways work in Pennsylvania today would take many volumes. The body of this report highlights a small fraction of this good career pathways work broken down into several categories.

First, we profile two programs within individual high schools or school districts. Some high schools and junior high schools have reorganized substantial parts of their curriculum around broad career pathways (e.g., the five defined by the Pennsylvania Department of Education (PDE), arts and communications; business, finance and information technology; engineering and industrial technology; human services; and science and health). After some exposure to each of the pathways, students select one to focus on (although students can usually change their mind and their career pathway later in high school). Students interested in engineering and industrial technology might take higher math, physics, and metals—and know why they are taking them. Science and health careers students might take anatomy, chemistry, and physiology, dual enrolling for some higher-level courses at a local State System

of Higher Education school so that they end high-school with college credits as well as foundational knowledge for a health care career. These broad career pathways exist within comprehensive high schools that cater to most Pennsylvania high-school students in an area as well as within Career and Technical Centers (CTCs), although they have longer historical roots in the latter.

Second, we profile one of a growing numbers of county/regional area-wide career pathways initiatives, the Career Ready Berks Alliance, which links with 18 school districts and two CTCs. These county/regional efforts aim at consistency and equity in career pathway opportunities, including work-based learning experiences by the end of high school. County and regional scale also achieve efficiencies in employer engagement, with Berks having recruited 180 to collaborative with schools in just the last two years. These regional efforts capitalize on the knowledge of local industries and relationships with local employers built up local workforce development boards developed during two decades of state and local investment in industry (training) partnerships.

Third we profile two narrower career pathways that aim at jobs in a specific industry and occupation—in these cases, the construction sector. A growing number of these are formal registered pre-apprenticeship programs—the primary bottleneck to the creation of more pre-apprenticeships being the absence of registered apprenticeship programs to feed into (a requirement for state registration of pre-apprenticeship is a connection to a registered apprenticeship program). The two examples profiled both target adult populations with barriers, in one case returning citizens in other diverse, low-income populations. They illustrate the design of services to address both the specific population’s barriers—e.g., using a “cognitive curriculum” to focus the mindset of prisoners re-entering society on developing healthy relationships, facing addiction, and aspiring to home ownership—and to give them entry-level industry-specific knowledge.

Some pre-apprenticeship programs are now embedded in high schools with others working with adults and classroom “related instruction” delivered by a community college or by a community-based organization. When embedded in high schools or training out-of-school youth, narrower career pathways and pre-apprenticeships may not lead to most, or even many, students entering apprenticeship or employment in that pathway, with other options including postsecondary education or jobs in other fields. Young people with a pre-apprenticeship or other credential may return to the pathway a few years later. After a succession of low-wage jobs and/or when they want to settle down, construction, manufacturing, or health care apprenticeship or other entry-level job for which they qualify suddenly looks like a better bet.

Although we do not profile a specific example, Adult and Basic Education (ABE), which also targets a population with barriers, pioneered career pathways in Pennsylvania and nationally. Within ABE, career pathways aim to help participants avoid getting locked into dead-end jobs. Formally or less formally using “integrated education and training,” ABE providers aim to achieve two traditional ABE goals: enhancing basic skills (e.g., English and math) and enabling participants to acquire a General Equivalency Diploma (GED). They simultaneously use career pathways to help participants aspire to, and then get, a job that has the potential to lead to a family sustaining wage. One policymaker analogized ABE career pathways to getting a boost so that you can reach the bottom of a fire escape from the street level.

Practitioners and policymakers offered several observations informed by efforts to promote career pathways over the past decade or more. Many point out that the career trajectories of adults in the labor market are often not linear, some highlighting with a smile that they would not want to diagram how they got to their own current job in workforce development or education. In some sectors, such as health care—which has many occupations recognized industrywide, some backed by regulation—career

ladders or lattices are more predictable and standardized. In other sectors, such as manufacturing—which has a bewildering amount of heterogeneity in jobs and job titles—there is very little standardization, sometimes even within a sub-sector or even a single firm. Furthermore, the advancement paths adults actually follow often transcend industry boundaries, capitalizing on portable foundational skills (communications, social skills, project management), and driven by the fact that acquiring a family sustaining wage may require leaving a sector with a high share of low-wage positions.

The reality of adult career trajectories led some interviewees to worry that “career pathways” communicates a misleading sense of predictability. More interviewees, however, saw the concept of career pathways as having benefits that outweigh concerns about its accuracy as a description of the job market. Particularly for low-income or other vulnerable populations—with limited family supports and financial resources and no margin to go into debt for college or training that do not pay off—there is an urgency about training leading to a higher-paying job. In addition, career pathways can get people who might get stuck in a low-wage job to think about how they might progress over time. Most ambitious, some interviewees perceived a goal of career pathways as helping people become their own career coach so they can exercise “informed choice.” i.e., gaining an understanding of jobs, employers, and the social process of advancement sufficient to enable them to make smarter choices about which jobs to take, when to change employers—and when not to—and which education and training to pursue.

One dimension of “informed choice” highlighted by several interviewees was that there are “other ways to win” besides going to a four-year college. These interviewees said the high college tuition and living costs can saddle young people with significant debt, but college does not guarantee a good job. At the same time, the retirement of the baby boom is creating high-paid openings in many “middle-skill” jobs. Career pathways provide a tool that allows young adults and their parents to analyze all employment options, including in these middle-skill jobs, with more information.

Within all variants of career pathways, wide recognition exists of the crucial need for strong connections to employers. These connections make it possible to transcend the historic separation of education and training from work. Business connections provide firsthand knowledge of jobs and careers so that curricula are up-to-date with industry. In younger grades and more exploratory school career pathways, business connections can yield workplace visits and job shadowing opportunities. By the latter part of high school or in programs for postsecondary students or other adults, employer connections can yield employment (sometimes paid) in internships, co-ops or pre-apprenticeships, summer jobs, formal mentoring by from experienced workers, guidance from industry insiders on how to get a job, and opportunities to apply for and secure permanent jobs. In some cases, business connections identify teachers from industry to deliver related instruction (in apprenticeships) or other classroom training (in other programs). Business connections also multiply opportunities for teachers to spend a day (during the school year) or a week (during the summer) “job shadowing” in industry within “educator in the workplace” programs to gain, or refresh, “real-world” knowledge.

With regard to high-quality career pathways and the strong connections to employers on which they depend, a challenge in Pennsylvania is one of scale. While many examples exist of exemplary career pathways programs exist, many schools and workforce providers do not fully integrate these into their work. One role for state policy is to change that.

Several current policies in Pennsylvania support high-quality career pathways.

- In the wake of the federal government’s elevation of career readiness as a goal for schools (with the Every Student Succeeds Act (ESSA)), the Wolf Administration developed the [Future Ready PA](#)

- [Index](#) and incorporated the index in the state’s [Career Readiness Standards](#). This step requires states to report on their implementation of career readiness standards in grades 5, 8, and 11.
- Pennsylvania’s tradition of industry driven education and training indirectly supports high-quality career pathways by strengthening the collective voice of industry and fostering industry driven partnerships and intermediaries that can partner with educators, trainers, and the workforce system. In the Wolf Administration, with support from the legislature, investments in apprenticeship and pre-apprenticeship, and restoration of some funds for industry partnerships, have strengthened partnerships with industry that provide a foundation for effective career pathways.
 - The Pennsylvania [teacher in the workplace](#) connects educators with local business leaders and employers. It enables teachers to visit local employers, learn about industry trends and skill requirements, and industry trends, and keep their curricula up to date.
 - PAsmart has also created 10 dynamic new “STEM (Science, Technology, Engineering, and Math) ecosystems,” that could help spread career pathways linked to STEM careers. This dimension of PAsmart takes place within a broader state and national movement that has rediscovered the power of “learning-by-doing,” including in higher-paid professions—a context conducive to more universal acceptance of concepts like CTE for all and Career Pathways for all.
- Challenges to Scaling High Quality Career Pathways
 - Employer and industry association capacity to engage with educators and the workforce system: the “free rider” problem
 - Policies that support experimentation but not systems change
 - Job quality: the lack of respect for all work and all workers
 - Funding
 - Policy: Towards an Industry-Driven, Worker- and Student-Centered Vision—Reinventing Grades 11-14 and Beyond
 - Develop a common definition of career pathways and common definitions of how concept is operationalized in schools, for adults, and with different vulnerable groups
 - Institutionalize industry driven education and training—scaling sectoral strategies and high-quality career pathways
 - An industry partnership and group apprenticeship tax credit
 - Make IPs/group apprenticeships employer representatives on curriculum committees
 - Scale the RA Navigator apprenticeship and other capacity development and peer learning for workforce intermediaries
 - Consider recreating the Center for Health and Center for Advanced Manufacturing Careers and other industry Centers, leveraging private and philanthropic funds—use these to identify and disseminate best practices for career pathways, industry partnerships, and group apprenticeship practices; and competency models and curricula (building on experience within CTE)
 - Promote CTE and career pathways for all, with work experience and education more deeply integrated starting with high school
 - Create a statewide system of post-secondary education in PA, leveraging federal funds
 - Dashboards: measure and monitor progress to drive the team effort to improve
 - Achieve Gov. Wolf’s goal of integrating workforce programs across agencies
 - Engage stakeholders—including education and training professionals—in fleshing out a vision and implementation plan

Introduction and Methodology

The Commonwealth of Pennsylvania commissioned this study to identify ways the state can support the development of strong career pathways statewide. At the outset, a perception existed that educators, trainers and other workforce practitioners use the phrase career pathways in a variety of ways—and thus that there is no common conception of what they are and of their value. The perception also existed that career pathways were more widely used within the K-12 system and less widely used in postsecondary education and adult workforce development. The perception further existed that some local workforce areas and parts of some agencies focus extensively on career pathways, but the application and development of the concept remains uneven. This raised the possibility that the state could step in to develop a more comprehensive system of, or support system for, career pathways—with payoffs to individuals, employers, and the state’s economy.

The research for this project relied primarily on interviews. To identify people to interview, the Pennsylvania Workforce Development Association informed the executive directors of the 22 Local Workforce Development Boards (LWDBs) about the project and that Keystone Research Center researchers would reach out to request names and contact information of two categories of people: the person with the best overview of all career pathways activity within the LWDB region; and the names of people with first-hand experience of the most substantial career pathways programs in the area. We also requested interviews with members of the Career Pathways and Youth Committees of the Pennsylvania Workforce Development Board (PWDB) based on a list and contact information provided by the PWDB. We identified additional interviewees using a snowball technique—i.e., based on suggestions made by interviewees identified by LWDBs or on the PWDB list. These approaches yielded a total of 40 interviews. KRC interviewed an additional several dozen people for an overlapping project on a particular kind of career pathway programs—registered pre-apprenticeships in Pennsylvania. (We also launched a survey of pre-apprenticeship programs in September–October 2020, but that survey remained in the field, and had not yet been analyzed, at the time of the submission of this report.)

In the scope of work for the project, PWDB identified specific questions that it wanted the research to address (see Appendix A). To address these questions, KRC incorporated them within an interview guide (also see Appendix A) used to conduct semi-structured, open-ended interviews.¹ Open-ended interviews are well suited to the development of grounded theory—theory developed inductively from empirical data rather than deductively from a set of axioms. Using deliberately general questions, the researchers permit the interviewees to describe how they think about a topic rather than imposing on their answers a pre-existing set of analytical categories and hypotheses (as with a survey). Open-ended interviews make sense on a project like this when the investigators do not know at the start of the research how informants conceive of the subject or the words, categories, and distinctions they use to make sense of the topic.

Before diving into the findings from interview, the next section provides a grounding in the formal definitions of career pathways which exist in federal statute and the Pennsylvania workforce and education systems. That allows us in later sections to consider how the formal definitions relate to the understandings of career pathways in practice.

¹ Barney G. Glaser, and Anselm L. Strauss, *The Discovery of Grounded Theory. Strategies for Qualitative Research*. Chicago: Aldine, 1967.

Career Pathways Definitions in the United States and Pennsylvania

U.S. Statutes

The concept of career pathways gained visibility during the early 2000s, when the workforce community in the United States sought to find ways to help low-income, low-education adults to move up to family supporting jobs. Welfare reform in the 1990s had moved many individuals off welfare and into the low-

wage labor force. Despite increased employment, many remained in poverty. This led local officials, foundations, and others to explore ways to better connect education and workforce training to pathways to better jobs.

Box 1. The Federal Definition of Career Pathways

WIOA, the Higher Education Act (HEA), and Perkins V define career pathways as follows:

The term “career pathway” means a combination of rigorous and high-quality education, training, and other services that—

- (A) aligns with the skill needs of industries in the economy of the State or regional economy involved
- (B) prepares an individual to be successful in any of a full range of secondary or postsecondary education options, including apprenticeships registered under the Act of August 16, 1937 (commonly known as the “National Apprenticeship Act”; 50 Stat. 664, chapter 663; 29 U.S.C. 50 et seq.) (referred to individually in this Act as an “apprenticeship”, except in section 171);
- (C) includes counseling to support an individual in achieving the individual’s education and career goals;
- (D) includes, as appropriate, education offered concurrently with and in the same context as workforce preparation activities and training for a specific occupation or occupational cluster;
- (E) organizes education, training, and other services to meet the particular needs of an individual in a manner that accelerates the educational and career advancement of the individual to the extent practicable;
- (F) enables an individual to attain a secondary school diploma or its recognized equivalent, and at least 1 recognized postsecondary credential; and
- (G) helps an individual enter or advance within a specific occupation or occupational cluster.

A dozen years later, in 2014, the Workforce Innovation and Opportunity Act (WIOA) established career pathways as a critical part of federal workforce development strategy.

The federal definition of career pathways was first codified in the 2014 Workforce Innovation and Opportunity Act (WIOA).² In 2015, Congress adopted the WIOA definition of career pathways within the “ability to benefit” provisions of the Higher Education Act (HEA), which allowed students without a high school diploma or equivalent to access federal financial aid for college (Pell grants, ordinarily restricted to individuals with a high school diploma or GED) if they are enrolled in an “eligible

career pathway program.³ The 2018 Perkins V Act then adopted the same definition to encourage secondary and postsecondary providers to use funds under that law to support career pathways strategies.⁴

The federal statutes define career pathways as high-quality education, training and other services that meet the standards in Box 1. These include: alignment with the skill needs of regional industry; preparing individuals for education as well as career success; career counseling and support; integration

² WIOA Section 3(7)

³ https://m.nationalskillscoalition.org/resources/publications/file/Investing-in-Postsecondary-Career-Pathways_web.pdf

⁴ <https://www.isbe.net/Documents/Perkins-V-Definitions.pdf>

of education and skills/occupational training; customization of services to help each individual learn and advance in their career; acquisition of a high school diploma/GED AND one industry-recognized credential; and help for occupational advancement.

The Pennsylvania Workforce System

Pennsylvania's Workforce Development Board Career Pathways and Apprenticeship Committee defined career pathways like the federal government but with the following five additions (Box 2). (1) The

Box 2. A Pennsylvania Definition of Career Pathways

The PA Workforce Development Board's Career Pathways and Apprenticeships Committee established the following definition of career pathways in: A career pathway helps individuals develop career awareness, connect with education, skills training and other services to earn credentials and advance into progressively higher levels of employment in high demand careers. A career pathway includes a/an:

- Industry sector strategy: Aligns with the ever-changing needs of industry and focuses on high demand careers.
- Family-sustaining wage: Connects individuals with careers that pay a living wage that can support a family.
- Contextualized education and training: Provides a full range of education and training opportunities in the context of a specific occupation (e.g. high school equivalency, post- secondary, Adult Basic Education, pre-apprenticeship, registered apprenticeship, internships, occupational licensing and registration, etc.).
- Credential: Results in a certificate, license, diploma and/or degree that is industry-recognized, portable, and stackable.
- Multiple Entry and Exit Points: Allows individuals to go in and out of education, training, and work as they advance through their career.
- Support services and navigation: Guides individuals with career exploration, coaching, and mentoring; identifies opportunities for career advancement and growth along the pathway; and connects individuals to resources to address barriers to employment (e.g. transportation, child care, housing, criminal backgrounds, disabilities, cultural or language barriers, etc.).
- Partner collaboration and braided funding: Brings together workforce, education, human services, community-based organizations, employers, and other partners, and their resources, to serve individuals in a comprehensive way.

Pennsylvania definition explicitly recognizes career awareness and, in association with that, opens the door to a potentially larger role for K-12 education within the state's application of career pathways. (2) Pennsylvania's WDB explicitly articulates the importance of a career pathways leading to a living wage. (3) Pennsylvania's definition further incorporates a concept embraced by national non-profit research and advocacy organizations focused on low-income workers: the importance of multiple entry and exit points. This feature avoids limiting people's options by locking them into particular vocational paths early (i.e., you can exit); but it also allows them to get onto a pathway later (i.e., at any entry point) if, for example, you are an adult otherwise locked into a low-wage,

dead-end job. (4) Pennsylvania also identifies partner collaboration and braided funding—so that government programs are not silo'ed and the government, non-profits, and private sector also collaborate. (5) Pennsylvania identifies performance outcomes as a goal—the importance of collecting, analyzing, and reporting performance data so continuous improvement can be achieved within the system. All of these additions reflect priorities of the Wolf Administration—i.e., reducing the separation between education and the economy; creating more “jobs that pay;” including for low-income workers; overcoming the tendency of individual agencies and programs to become silo'ed rather than working together towards a collective, overall goal; and performance management and continuous improvement.

Career pathways are central to Pennsylvania’s WIOA plan. The first of the plans five goals centers around career pathways (Box 3): “Establish career pathways as the primary model for skill, credential and degree attainment and provide all Pennsylvanians with barriers to employment, an opportunity to obtain a job that pays.” The tie of career pathways here to individuals with multiple *barriers to employment* mirrors the federal definition. The PA WIOA plan expands on Goal 1 with 10 strategies to support career pathways in the state. This includes such things as: give priority to job seekers with barriers to employment by offering supportive services and multiple entry points into career pathways; expand apprenticeship and pre-apprenticeship programs into non-traditional occupations; refine the process of High Priority Occupations which pay good wages, have higher skill needs and are in demand; and establish lists of industry-recognized credentials.

Box 3. Pennsylvania’s Five WIOA Plan Goals⁵

“Our five broad goals for the commonwealth’s workforce development system are:

1. Establish career pathways as the primary model for skill, credential, and degree attainment and provide all Pennsylvanians, with an emphasis on Pennsylvanians with barriers to employment, an opportunity to obtain a job that pays.
2. Expand public-private investment in the state’s pipeline of workers and in incumbent workers for targeted industry sectors from entry-level skills to middle skills through Next Generation Sector Partnerships, the Workforce and Economic Development Network of Pennsylvania (WEDnet PA), and other innovative strategies.
3. Increase opportunities for all youth to participate in work-based learning through summer employment, pre-apprenticeship, apprenticeship, internships, and other experiences in the workplace.
4. Engage employers through multi-employer workforce partnerships to improve the connection and responsiveness of workforce programs to the demand side of the labor market, increase public-private investment in critical skills, and support the spread of employer practices that create jobs that pay.
5. Strengthen data sharing across state agencies and workforce development partners to better understand education and employment outcomes and rely more effectively on data to improve and target our efforts.”

Pennsylvania’s Academic Standards for Career Education and Work

In 2006, the Pennsylvania State Board of Education promulgated regulations (22 Pa. Code Chapter 4)⁶ establishing academic standards related to career exploration and pathways, the “state Academic Standards for Career Education and Work (CEW standards).”⁷ All students must meet the CEW standards, which lay out what students should learn in four areas of knowledge by grades 3, 5, 8, and 11: career awareness and preparation (Section 13.1); career acquisition—i.e., helping students learn

⁵ WIOA State Plan for the Commonwealth of Pennsylvania, FY 2018, online at <https://www2.ed.gov/about/offices/list/osers/rsa/wioa/state-plans/pa.pdf>

⁶ Technically, the State Board of Vocational Education (SBVE) promulgated the Chapter 339 standards as required under the federal Perkins Act. In Pennsylvania, the State Board of Education and the SBVE are one and the same and a gavel is used to put on the SBVE hat as necessary in compliance with federal law. The state’s Career Education and Work standards can be found at:

http://www.stateboard.education.pa.gov/Regulations/AcademicStandards/Pages/default.aspx#.VfnY0FTD_Vg

⁷ This section draws heavily on the December 2019 revision of “Career Readiness Indicator for the Future Ready PA Index and ESSA Accountability: Guidelines for Evidence Collection, Monitoring, and Reporting,” online at <https://www.education.pa.gov/Documents/K-12/Career%20and%20Technical%20Education/CEWStandards/Main/Career%20Readiness%20Guidance.pdf>; and other sources cited.

skills that can help them get a job (Section 13.2); career retention and advancement (Section 13.3); and entrepreneurship (Section 13.4).

In addition, Pennsylvania regulations (Chapter 339⁸) require the development and implementation of a comprehensive program of K-12 guidance services aligned to the CEW standards and that all schools integrate the CEW standards into their curricula. Since the adoption of these CEW standards, PDE has worked with educational, business, and other stakeholders to develop resources to ensure that all students have access to rigorous, standards-based instruction.⁹

Within the Wolf Administration and as part of the state’s compliance with the federal [Every Student Succeeds Act \(ESSA\)](#), enacted in December 2015, PDE adopted more specific reporting and accountability related to the state’s CEW standards within the state’s new [Future Ready PA Index](#). This index aims to ensure that students who graduate high school can succeed in both college AND career.

The Career Readiness Indicator recognizes efforts to ensure that all students have access to career exploration and preparation activities that are standards-aligned and evidence-based, including the development of career plans and portfolios that help students identify pathways and opportunities for postsecondary success. The Career Readiness Indicator identifies the percentage of students in a reporting cohort who demonstrate meaningful engagement in career exploration and preparation and implementation of individualized career plans in grades 5, 8, and 11.

1. The percentage of students who, by the end of grade 5, demonstrate engagement in career exploration and preparation aligned to the CEW standards, via [PA CareerZone](#) or a locally designed career exploration and preparation program/curriculum.
2. The percentage of students who, by the end of grade 8, create an individualized career plan and participate in career preparation activities aligned to the CEW standards.
3. The percentage of students who, by the end of grade 11, implement their individualized career plan through ongoing development of a career portfolio and participation in career preparation activities aligned to the CEW standards.

The Pennsylvania Temporary Assistance for Needy Families (TANF) Plan

The Pennsylvania TANF plan uses career pathways as a holistic concept through which individualized service delivery (e.g., of adult education, training, career counseling, job placement assistant, and other wraparound supports) will help people gain employment and advancement (Box 4).¹⁰ The TANF plan highlights the state’s KEYS program as one vehicle for promoting career pathways for TANF recipients. KEYS ordinarily relies on training by community colleges and can potentially access federal funding for “Ability-to-Benefit” Pell grants. KEYS in some cases also draws on career advancement paths mapped out by L&I funded industry partnerships.

Box 4. Career Pathways in the Pennsylvania TANF Plan

Pennsylvania will comply with Section 402(a)(1)(A)(iii) of the Social Security Act. The CAO will assist all individuals who are required to work to find opportunities through the Employment, Advancement and Retention Network (EARN) program and the PA CareerLink® system. Both services can be accessed locally, and

⁸ “Chapter 339: Vocational Education” can be found at http://www.pacodeandbulletin.gov/secure/pacode/data/022/chapter339/022_0339.pdf

⁹ For an electronic toolkit of resources to assist teachers and administrators implement the PA CEW standards, see <https://www.education.pa.gov/K-12/PACareerStandards/Pages/default.aspx#tab-1>

¹⁰ https://www.dhs.pa.gov/Services/Assistance/Documents/Cash%20Assistance/c_095465.pdf

each person will be able to get individualized services. These services include job placement assistance, career counseling and training opportunities within a career pathway.

- Individuals who have some work experience will be referred to the EARN program, which assists with job placement and job training opportunities. At this stage of services, it is expected that individuals will be able to access Workforce Innovation and Opportunity (WIOA) services such as job training programs aligned with a career pathway, an On-The-Job training program, or a Transitional Job Program. Individuals with multiple barriers to employment are a priority under WIOA. This priority status will help individuals access the training services they may need to be employed.”
- Individuals who need to rectify some barriers such as literacy, “soft skills” development and support services such as childcare and transportation assistance, will be referred to a Work Ready provider. This contracted provider will assist the individual with barrier removal strategies and then refer him or her to the EARN program when he or she is ready.
- Individuals who could benefit from a training opportunity at a community college will be referred to the KEYS program. This program enrolls individuals who are ready to learn in a college setting. Once the individual has completed their education at the community college, he or she will be connected to the PA CareerLink® system for job placement assistance.

Understanding of Career Pathways in Pennsylvania Practice

We are now ready to dive into the insights from our interviews. Three main broad findings emerged.

A Shared Broad Understanding of Career Pathways

One reason the PWDB commissioned this study was a perception that educators, trainers, and other workforce practitioners use the phrase career pathways in a variety of different ways, and that there is no common definition or understanding of pathways purposes and benefits. The interviews revealed that most applications of the concept of career pathways do fall within a broad common sense definition—i.e., an occupational progression that leads towards family sustaining employment, tied to a sequence of education and/or training offerings that enable participants to develop skills required to advance. In some cases, towards the end of high school and beyond, the education and training lead to industry recognized credentials as well as academic credit. In addition, career pathways in practice tend to offer multiple “on ramps” and “off ramps”—they are not rigid routes to good jobs but allow participants to access education and career advancement at whatever points and for however long those jobs serve participants’ interests and/or needs.

One LWDB director [Mary Salony] said “Career pathways is about allowing people to see their options. With schools it’s about exploration until, in high school it becomes more about the actual pathway or progression.”

Another LWDB director [Melissa Fleming] said “the basic concept is the same. For students it’s career exploration: what is the end goal, what steps do you need to get from A to Z?...We do that education with our career coaches and our teacher in the workplace grant—expose educators to different industries and pathways; then they in turn have an opportunity to create career-connected curricula.”

An agency policy director [Tara Williams] said, “A career pathway is a system or structure that jobs and occupations fit into. Support and wraparound services can help people get to their goals along the pathway. Entry and exit are important—if they need to focus on family and a job, they can step out then step back in later and move to higher levels. That’s my ideal version of it.”

Another interviewee said: “Career pathways align education, training, and social services with a particular industry’s skill needs. Students can be led in a particular direction, towards jobs or postsecondary credit.”

Distinct Applications of Career Pathways

Distinct, narrower applications of the broad career pathways concept associate with different age groups and different categories of workers. The first parts of career pathways in K-12 education offer career exposure and exploration—allowing students to learn more about the great variation that exists in jobs and careers and, in some cases, how their career knowledge gets applied in the real world.

One Wolf Administration [Allison Jones] policy leader noted that not all high-school programs go beyond career exploration: “In Pennsylvania, a lot of K-12 and CTE career pathways seems more like career exploration and awareness, rather than identifying what comes next after you find out what path interests you.” A CTC administrator with experience in two different parts of the state, however, highlighted significant alignment of K-12 academic education in some areas with careers because of career pathways. “What do career pathways mean to me? If you are going to be a machinist, you take specific courses. You should have higher math, maybe physics, metals. Keystone Central, 27 years ago,

built its high school curricula around career pathways. It was ahead of his time.” He elaborated with other examples: “There is no reason a health careers student shouldn’t have anatomy and chemistry. Starting this fall, our kids will take anatomy and physiology with dual enrollment, an approach we were already taking in Schuylkill. We’ll have 24 students enrolled at Lock Haven, receiving eight credits at 25% tuition.”

A business representative [Allen Norton] noted that he thinks of career pathways in two ways: “One way is to start young. PDE has been doing great work on introducing career pathways programs—employability skills—in kindergarten. Middletown High School exposes people to different pathways in junior high, such as engineering and industrial technology, human services, careers in the arts. In high school, all electives focus on this career pathway. Students participate in job shadowing and visit colleges that have those pathways.” The second meaning of career pathways to this business leader was advancement for adult workers, including those employed whose further education and training employers support: “As a Harrisburg Area Community College (HACC) student and nursing assistant at Pinnacle, you can study for Registered Nurse and your employer is paying for most of it. From there, she can become a nurse anesthetist or a physician’s assistant.”

In Adult Basic Education (ABE), career pathways integrate academic education with occupational training so that participants can acquire, in many cases, a GED, improve their basic skills, AND increase their chances of securing a job that is the first step on a ladder not a dead end.

A PDE leader of the state’s ABE programs [Amanda Harrison] noted that career pathways originated in ABE because of the concern with participants ending up in low-wage, dead end jobs. “We’re the beginning of the career pathway for folks that don’t follow the normal K-12 then K-16 route. We have been talking about career pathways for longer than anybody else. WIOA aims to identify this population and help make career pathways accessible to people with barriers. Career pathways are like fire escapes that start too far above street level to reach. ABE is the boost to grasp that bottom rung.”

She added that, “for our purposes, in ABE, career pathways help students think longer term. Usually it’s ‘I want to get my GED.’ We need to persuade our students that they need to do more than get a GED. ‘What do you want to do after you get your GED?’ We want to help people understand how they get to an entry-level job that will then take them where they want to go.” Many of these participants cannot initially get a job at employers known for offering jobs better than typical for their industry, such as Costco or Trader Joe’s. But if people develop employability skills, gain work experience, and then interview well based on that experience, they can then get jobs at employers with better jobs.

She and other ABE experts highlighted the benefits of “integrated education and training” which combines basic education with workforce preparation and occupational training: “ABE happens within the content of the training and in a deliberately transparent manner—so that people can apply the knowledge and understand how they are applying the knowledge.” She noted further that pre-apprenticeships with strong connections to apprenticeship programs offer a particularly rich application of integrated education and training that can lead to career advancement. She concluded: “Big picture, one ultimate goal is to have everyone in the workforce development system understand how ABE and the population in ABE, including immigrants, fit into career pathways—and provide the workforce that employers need.”

A representative of the Governor’s Policy Office [Allison Jones] also highlighted the importance of helping low-income adults advance: “A lot of people come to the workforce system wanting a job, and sometimes they do need that. But with the emphasis in WIOA on career pathways, and given the

Governor’s concern about job quality, not dead-end jobs, we want to be sure that additional education and training leads to family self-sufficiency.”

A second representative of PDE, spoke in pointed terms of the importance of offering low-income adults and youth with clear pathways to better pay. Speaking about her own college experience, she said: “Vassar bombarded you with the message that you don’t need to figure out career in a hurry.” You were encouraged to take time to “find your bliss” or passion. “But if you don’t have family resources,” the PDE official said, “you need a linear path for now. And to retain flexibility to pursue other paths in the long run.”

A prisoner reentry program in Berks County which is profiled below offered another example of a career pathway adapted for an adult population with barriers. One of the program managers [Peggy Kershner] said, “We are now career pathways believers. We do the opposite of trying to fit someone into an open, low-wage job. We try to lead participants to family sustaining wages and not be stuck in a low-wage job or bounce from one to the next.” As discussed below, the program sees its “cognitive curriculum,” customized to getting reentrants “in the mindset to pursue a career pathway” as a critical component of their successful reentry program.

Some workforce boards believe that their strong connections to industries help give K-12 educators and adult workforce trainers the knowledge they need to create career pathways into those industries. A SW Pennsylvania LWDB director [Ami Gatts], for example, highlighted her areas mutually beneficial bridging of K-12 and community based training to apprenticeship: “We’ve built a system that connects us to K-12 transition coordinators, guidance counselors, principals. On the apprenticeship side we are super-connected and have good relationships with unionized building trades, all of which are listed on the eligible training provider list. And we also connect to many leading manufacturers [with apprenticeships], such as All Clad, Duck Mate industries, and others.”

Not surprisingly given the variation in how career pathways get applied for different age groups and populations, some interviewees still perceive the concept as “very confusing to people” and that “everybody does it different.” In addition, substantial differences exist between the broad pathways typically relied on in K-12 career exploration—including five career pathways defined statewide by PDE (see the Middletown High School example below)—and narrow pathways tied tightly to industry recognized credentials and career advancement in the labor market (e.g., pre-apprenticeship to apprenticeship). One interviewee described K-12 career pathways as “silo’ed” and focused on educational attainment, most obviously graduation rates, not career progress. Another said, “the educational system is no use to industry.” But these critiques came up rarely and the Berks Country Career Ready case study below suggests a possible explanation: parts of the K-12 education system have gone to great lengths recently to better connect their broad high-school career pathways to employers and to enable students to succeed in their careers as well as at college.

To sum up, the message from our interviews regarding the meaning of career pathways is that Pennsylvania educators, trainers, and workforce practitioners are more on the same page—or at least in the same chapter—than they realize. The field of career pathways in Pennsylvania is primed to focus not on terminology but on doing good work. In the words of one CEO, “the concept of career pathways—people are aware that they are on a journey to a living-wage career—is a really great idea. We just need to get on with it.”

Payoffs to High-quality Career Pathways

All the applications of career pathways have in common an effort to connect education and training more deeply to the world of work, overcoming a separation with historical roots in the formation and scaling of high-volume U.S. manufacturing from the late 1800s to about 1980. Over that century, early in which mass schooling began, Americans took for granted, especially in retrospect and from the 1950s to the 1970s, a sequential not interwoven view of education and work: life started with schools—K-10 or -12 for working people, college for the professions and some managers—and was followed by decades of employment. White men often landed a one-company career by some point in their twenties. This oversimple story about education followed by work got a new lease on life because of the divergence in wage trends for college and non-college workers in the late 1970s and early 1980s, focusing the energies of the most privileged third of Americans—and hence of our schools—on getting their children into college.

What all the applications of career pathways also have in common is a conviction that better connecting education and training to the world of work makes sense for individuals, for employers, for our economy. Strengthening this connection is good pedagogy. Most students, even those at the top of the class who thrive without linking classroom learning to its real-world application, gain motivation, engagement, and intellectual curiosity from understanding how their math, writing, and other skills get used to build our economy and society. Most students, in fact most people, also learn most things by doing them, sometimes with a little help from their friends, not by understanding the theory of how to do them.

A corporate executive [Tim Bean] underscored the virtues of learning by doing based on his own son's experience: "My son didn't do well in school until he took a shop class. He is now in his fourth year at Penn College: welding and metal fabrication engineering. Two-years of welding then two more years of engineering. The school sent him to an internship in Portage Indiana."

A state agency workforce specialist [Scott Sheely] said simply, "experiential learning is better." A belief in the value of experiential learning led this specialist and others to highlight the benefits of apprenticeship and pre-apprenticeship. "Apprenticeship is fraught with issues—can you make the logistics of apprenticeship work? But working and learning from a mentor is what works best. For the same reason, engineering programs at Drexel that have coops have always had the edge. It has to be an intentional program of contextual learning." A Career Link staff member who previously helped manage coop programs for Drexel University echoed this comment: "Apprenticeship makes a lot of sense—learning by doing." A SW PA LWDB executive director [Ami Gatts] said "apprenticeship should be a more widely used workforce development approach. EMT to advanced EMT. We would like to build an apprenticeship around that. It could also be applied in banking. We have a lot of financial services."

Applied learning to acquire specific skills and knowledge that the learner regards as valuable has the potential to increase learning especially for individuals who are bored or lack confidence in traditional classroom-only approaches—whether in grades 10-12 or classes for adults seeking a credential (e.g. a GED) or a job. Further, many interviewees suggested that work-based learning better develops "21st century" skills that employers today most prize—communications, social skills, problem-solving, etc.—skills which also increase workers' resilience and adaptability.

A business organization representative said [NORTON] "The key is those employability skills—that are transferrable from job to job. Many businesses are willing to train people on technical skills. We need people who can communicate, work with others, problem-solve, and show up on time."

A PDE leader of adult education [HARRISON] SAID: “Our role is to help people develop employability and academic skills to post-secondary education and gain employment.” She added that ABE “...reporting outcomes are now the same as other folks. We have moved away from educational gains towards job-based outcomes” even though it is harder.

A corporate executive highlighted the success of two interns from a Pitt-Bradford information technology program one of whom worked in information technology and the other in stock room at his northern tier Pennsylvania company. The first intern was with the company for two years and then moved to Pittsburgh, contributing before he left to a decision to implement a revamped ERP (enterprise resource planning) system. The second, a math major from Japan he described as “phenomenal” and “eager to learn.” In these examples, the employer as well as the interns, benefitted substantially.

A PDE official also pointed to career pathways and the integration of work-based and on-the-job experience as vital to “the most important educational outcome,” self-directed learning—the ability to learn how to learn and for students to “direct themselves.” “Without that, you have people in and beyond high school grasping only what’s put in front of them. This perpetuates a lot of inequities. If you only know people who work in certain fields, you are limited to those fields.” She highlighted the [Deerborne STEM Academy](#), a model school in Massachusetts, which applied career pathways in grades 8-12 to a student body with diverse and low socio-economic status students.

A leader of a statewide non-profit that provides technical assistance and training to help spread effective career pathways programs said: “A true career pathway has to be a combination of classroom and hands-on learning. Our after-school programs starting as early as elementary school focus on exposing students to experiences that expand their horizons. There’s also strong need for equity so that students from all communities get this exposure. Our learning centers mostly serve underrepresented students.”

Work-based learning fosters high-level employability skills for the simple reason that many such skills are used much more in the workplace—in the context of accomplishing practical tasks a business needs done—than when completing classroom assignments divorced from any practical application. Two last potential advantages of connecting education and training to jobs and careers: better employment outcomes—less joblessness, higher compensation, greater advancement—for individuals and a more productive and stable workforce for employers.

Many career pathways programs aim to give students more knowledge of jobs, their prerequisites, and how to move from entry level or lower level jobs to higher paid ones. Some focus explicitly on what one interviewee called “workforce advising” that fosters “informed choice”—so that the participants make smarter choices because of their career pathways program, increasing their incomes and improving the fit of their career with their interests and strengths. “Fostering informed choice helps participants understand the industry they are in, have a plan, and understand the steps they need to get to the next rung. It would be great if we could be with people for longer, and we could be with them as they complete additional steps. It’s important to be really specific—you want to be a welder, these are the available certifications, this is who teaches courses that lead to those certifications, you can apply for this scholarship and this Pell grant to pay for these courses.”

Examples of Pennsylvania Career Pathways

The amount of high-quality career pathways activity in Pennsylvania today (prior to COVID 19) is impressive. By way of comparison, in 2018, leaders of the most prominent career pathways learning network in the country published a book with five case studies aimed at making the concept of career pathways concrete.¹¹ Fully profiling all the good career pathways work in Pennsylvania today would take many volumes. Below we highlight a small fraction of this good career pathways work broken down into three categories: K-12 programs; programs serving populations with barriers; and county- or region-wide collaborations to map career pathways that include K-12 schools, higher education, workforce boards, and business organizations.

Career Pathways in High Schools

An earlier report by the Keystone Research Center profiled the career pathways at the Milton Hershey School in Pennsylvania, a private no-cost residential school for 2,100 students in grades K-12 from across the country, most of whom come from families in poverty.¹² The school has an academically rigorous curriculum that emphasizes career and technical education (CTE) and prepares students for success in careers and/or college. Students get exposed to CTE in grades 3 and 4; to hands-on learning linked with 11 CTE pathways in middle school;¹³ explore four of the pathways for four weeks in 9th grade; and then pick a pathway in the second half of ninth grade. The curriculum is organized around the selected pathway for the rest of high school and includes hands on learning and authentic work experience (e.g., in internships and coop programs); paid summer jobs; and the opportunity to earn up to \$95,000 for college. Some students enter careers immediately, others attend college, in some cases at elite universities. Milton Hershey's CTE programs have robust advisory committees that advise it on best practices in industry and lead to two-to-four industry certifications. Two of Milton Hershey's career pathways—in culinary arts and construction—have recently become registered pre-apprenticeships, solidifying career pathways to apprenticeship for those at the school who do not immediately go onto a four-year college.

Middletown Area School District, a little to the south of Hershey, has one of the most developed public school K-12 career pathways initiatives that serves non-CTE students.¹⁴ A school leader said, "I don't like to call it a program—culture is a better term." The late Mike Thompson, who died in April 2020, first developed the Middletown high-school program. Thompson was "the Godfather of K-12 career development in the state." Thompson and a colleague, Betty Holmboe, developed career pathways guidance for PDE based on their experience and provided technical assistance to schools and districts across the state.

Middletown's career pathways began as a grass roots, bottom-up initiative around 20 years ago. While the American School Counselor Association (ASCA) highlights three broad domains of knowledge as vital for high-school students—academic, career and social/emotional development—Thompson believed that career development often got neglected. He believed, further that career development is "the key to improving a person's life. He wanted to create a model that would create opportunity for every kid."

¹¹ Robert P. Schwartz and Amy Lloyd, *Career Pathways in Action*, Harvard Education Press, 2019.

¹² See Keystone Research Center, "An Inventory of Pre-Apprenticeship Programs Across Pennsylvania," January 7, 2019, pp. 35-36.

¹³ For a list of the pathways, see <https://www.mhskids.org/academics/mhs-career-technical-education/cte-pathways/>

¹⁴ As well as the other sources cited, this case is based on interviews with a Middletown high school leader and Pennsylvania business leader and on Pathways Innovation Network Pennsylvania, "Promising Practice: Middletown Area School District Pathways to PRIDE," National Center for College and Career Transitions, no date.

When the state’s academic standards for Career Education and Work came out in 2006, Middletown worked its high-school career pathways approach back into middle school, again informed by recommendations from ASCA, the professional association of career counselors.¹⁵ Since students make the decision about going to CTC or comprehensive high schools in grade eight or nine, they need career exposure in middle school if they are to make an informed choice. In middle school and grade nine today, Middletown students research careers and participate in career development activities aimed at envisioning their pursuit of a specific career (Futures I in grade 9). High school students then select one of five pathways in PDE’s statewide [Career Pathways Framework](#) (arts and communications; business, finance and information technology; engineering and industrial technology; human services; and science and health) and focus their high-school electives on preparing for that pathway (https://raiderweb.org/academics/career_readiness/featured_pathways). Service-learning and experiential learning opportunities aim to develop such 21st century skills as perseverance and discipline. High-school students participate in job shadows and college visits aligned within their pathways. The district organizes a job fair every March or April that is not aimed at securing job or interviews but provides an opportunity to ask industry representatives “what’s a day in your world like?”

To date, Middletown has not sought to register any of its pathways as state pre-apprenticeship programs, pointing out that “we’re not a CTC.” Some of the school’s pathways do, however, help students pursue a career in their chosen pathway. For example, over 150 students have graduated from Middletown with a certified nursing assistance (CNA) credential, enrolling in a course at Harrisburg Area Community College, working at a nearby elder care facility, and sitting for the CNA exam before graduation. “A lot of those students are in the nursing field today,” advancing beyond CNA because they had a career plan before leaving high school.

The principal emphasized that “the model’s not expensive—you have to commit to it.” A dozen champions in the high school “do everything with career pathways,” linking high school students, for example, with masters students in public health and with academic experts in epidemiology—a suddenly more visible field in the context of COVID 19. Students present their epidemiological research findings on a spring evening on their own time.

Some Middletown students change their career pathway part way through high school—their first choice is not “etched in stone.” By the end of high school students must write a career action plan. The school leader described this as a powerful event, “The kids pour their guts out.” One indication of the program’s success is students’ self-reported answers to the question “do you feel like Middletown helped you become career ready?” Over 80% of students said yes prior to COVID, with little difference in this share for children on free-and-reduced lunch—one indicator of equity in career development opportunities within the district.

One frustration for Middletown career pathways leaders: other districts that express interest, and receive guidance from Middletown, may not adopt the approach. Even so, Middletown champions say, if it were mandated it would not work because school leaders and teachers must own the program. The recent adoption of the Future Ready Index has increased districts attention to career pathways, but a

¹⁵ Other sources that informed Middletown’s efforts early on include Elaine Makas Howard and Pamela J. Ill, *Career Pathways: Preparing Students for Life*, Corwin, 2003; and the writing of Penn. State emeritus Professor, Ken Gray. See, for example: Kenneth C. Gray and Edwin L. Herr, *Other Ways to Win: Creating Alternatives for High School Graduates*, Sage Publications, first published 1995; and Kenneth C. Gray, *Getting Real: Helping Teens Find Their Future*, Corwin, 2008.

challenge remains developing measures of progress that go beyond checking a box and capture the core of successful career pathways.

Area Wide Career Pathways Mapping

Across Pennsylvania, a growing number of county- or region-wide efforts have launched to map common career pathways, led by K-12 schools but with the participation of higher education, workforce development, business, and labor. These efforts aim to map advancement paths within local industries above entry-level rungs, and to identify education and training sequences that allow people to move up to better paid employment or to acquire additional credentials and academic credit. This countywide work builds on local workforce boards' knowledge of local industries and relationships with local employers developed during two decades of Pennsylvania investment in industry (training) partnerships.

One of the most countywide career pathways mapping efforts launched in early 2017, the Career Ready Berks Alliance (<http://www.careerreadyberks.org/>).¹⁶ The initiative fulfills PDE career readiness requirements and uses, like Middletown, the five pathways in PDE's [Career Pathways Framework](#)—arts and communication; business finance and information technology; engineering and industrial technology; human services; and science and health.

The board of Career Ready Berks includes all the county education and workforce leaders—a self-conscious effort to get all these different players and institutions on the same page: the LWDB director, the president of Reading Area Community College; the executive directors of the business-education coalition; the business liaison for Career Ready Berks; the executive director, director and program administrator of the Berks County Intermediate Unit; the associate director of a community and academic partnership, and the executive director of the Berks County Technical Center.

Berks started exploring career pathways, primarily with CTC students, in 2014-2015. The countywide career pathways effort launched two years later for several reasons. The federal Every Student Succeeds Act (ESSA), passed in December 2015, required states to implement plans to ensure K-12 students graduate ready to succeed in career as well as college. Governor Wolf, a champion of K-12 support for career readiness, implemented ESSA by establishing Pennsylvania's Future Ready Index, with new school career standards and requirements to collect evidence of implementation in grades 5, 8, and 11 (e.g., by documenting career exploration in earlier grades and, in addition, workplace experiences such as job shadowing and internships by grade 11).

Around the same time, some Berks County school districts recognized that their students had good high-school graduation rates followed by college attendance but then many students dropped out of college after a semester or a year. Students attended college without a plan or much information on their future options. Third, businesses led by manufacturers, faced increasing challenges because of retirements of baby boomers. They needed to replenish their workforce but did not know how to reach K-12 students. Most schools had no knowledge of manufacturers' needs or even much awareness of manufacturers' existence.

PDE defined the states five statewide career pathways a few years after it revised the state's career education and work standards in 2006. Districts paid the standards and the pathways little heed until

¹⁶This case draws from an interview with Rory Stevenson, online materials including the completed framework (https://www.berksiu.org/wp-content/uploads/2018/11/CRB_FrameworkAlliance_Oct2018.pdf); and https://www.readingeagle.com/money/career-ready-berks-program-points-students-toward-successful-career-paths/article_069445ac-43a8-11ea-b314-cb01ff173c4c.html

the Future Ready Index came out. Now the Berks Ready Career Alliance took a hard look at school districts' electives and associated each with one of the five pathways. A central part of BRCA's mission is putting career readiness information at students' fingertips equitably across all 18 of the county's school districts—which vary a lot in poverty, income, and wealth.

The completed Berks framework outlines career pathways activities that make sense from elementary school through high school. It also maps out work-based learning and post-secondary experiences that high schools can integrate into their career pathways. Through an articulation agreement with Reading Area Community College, technical courses offered by the Berks or Reading-Muhlenberg Career & Technology Centers enable students to graduate high school with 27 college credits (i.e., three quarters or more of the 32-36 credits required for a full college year).

While K-12 schools have in the past been criticized for having career pathways divorced from business needs, the Berks effort has gone to great lengths to create strong connections to employers. It has pathway advisory committees with business representatives who provide information on employer needs. The career pathways effort, and individual schools, then seek to map how students can acquire skills required for different occupations. The LWDB provides data on the average income and BLS-defined education and training requirements for those occupations. The process has surfaced engineering and industrial technology, for example, as important pathways in the country, a reflection of its still-strong manufacturing sector.

Another key to avoiding pathways divorced from the job market: getting teachers informed and bought in. Berks County has an extensive teacher in the workplace program which includes one-day shadowing opportunities for teachers during the school year and a five-day intensive job shadowing in the summer, with a stipend. Over 500 teachers participated in the two years prior to COVID, most of them non-CTE teachers from the full gamut of disciplines—science and math, but also English, art, music, and social studies. The program tries to match teachers with a business in the career pathway which their teaching most overlaps or in an industry that the teacher requests.

Business engagement in career pathways activities provides another, growing connection to the economy. Starting only two years ago, the effort has recruited 180 businesses that have formally committed to providing work-related experiences for students and teachers, such as facilitating field trips, offering job shadowing and work-based learning, summer jobs, providing employees to speak at career days, and business mentors. All students in high school develop career portfolios.

Asked her vision of the Berks career pathways in 10 or 20 years, a program administrator said: “All students would have workplace experiences in school—such as internships and job shadows. Also, real-world problem-solving would be a regular experience in the schools.” To illustrate the notion of “real-world problem-solving,” she described a new “Solve it Berks” partnership with Albright University. In the context of the COVID pandemic and a shift to on-line learning, businesses tie in virtually to schools and pose a real-world problem to students that the business faces in the workplace. By the end of the semester, students develop a solution then make a seven-minute presentation to the business.

Countywide or areawide career pathways efforts have taken place in many other places across the state in recent years (e.g., in Bucks County, in Erie under the auspices of the “Erie Together” collective impact project, and in Philadelphia).

Career Pathways Serving Populations With Barriers

The Pittsburgh Construction Workforce Partnership

An emerging construction workforce partnership (CWP) in Pittsburgh has begun to succeed where many previous programs have failed.¹⁷ It aims to place a diverse workforce from low-income communities into good paying careers in construction and manufacturing, including the unionized building trades. Two of this career pathway's critical design features are at the end and the beginning of the program. At the end, CWP has strong relationships with construction contractors and unionized building trades, who agree to interview and often hire referrals because CWP has demonstrated the ability to deliver good candidates. At the beginning of the program, CWP has a proprietary screening system that enables it to select participants with a good chance to succeed after they receive pre-employment training and other supports. When pre-employment training and pre-apprenticeships do not have good access to unionized construction job and hire people up front who cannot meet entry requirements (e.g., they have no HS diploma or GED, do not have a driver's license, and are not drug free), participants are set up for failure—trainers and service providers may get paid but trainees don't get jobs, employers don't get qualified candidates, and minority communities and unions affirm their negative views of each other.

The LWDB in Pittsburgh, Parter4Work, manages CWP. The program's relationship with unionized construction contractors and the building trades comes in part from a partnership with a regional labor-management industry group, the Builders Guild (<https://www.buildersguild.org/>). CWP works with trades and contractors to define occupational and employment needs and qualification requirements, and to jointly develop recruitment, assessment, training, placement, and retention strategies. This joint development ensures that contractors and trades trust the quality of the candidates referred after they complete the program.

After their selection, participants receive pre-employment training (typically for about six weeks) which in some cases is adapted from an apprenticeship readiness curriculum developed by the national building trades—"MC3" or the Multi-Craft Core Curriculum.¹⁸ Five community-based organizations help recruit candidates from among the unemployed, underemployed, and low-income workers, with the goal of increasing the number of women and minorities who access jobs, apprenticeship and careers in construction: A. Philip Randolph Institute, Garfield Jubilee, the Community College of Allegheny County (CCAC), Trade Institute of Pittsburgh, and Community Empowerment Association. As well as recruiting participants, these groups deliver training and other supports. Other components of the CWP model: recruitment and training of current journey-workers to provide workplace mentoring, and creation of peer advisor networks, including from the ranks of existing women and minorities in the trades.

As noted above, one final critical piece is locking in access to job opportunities. This is done several ways. Leveraging city and county commitment to diversifying the pipeline to unionized construction jobs, CWP seeks to become the recruitment arm for job openings on major construction projects in the city (these may be apprenticeship openings or other openings in contractors seeking specific skills for the job at hand). For example, CWP secured an agreement from Pittsburgh Arena Real Estate Redevelopment (PAR) to be the "First Source Hiring Agency" for the Lower Hill District Redevelopment project. In addition, prior to COVID, the Laborers union (LIUNA, the Laborers International Union of North America) had agreed to hire qualified program completers, with the understanding that those candidates might later enter an apprenticeship in another trade. In some cases, candidates may also

¹⁷ This case draws from an interview with Earl Buford, Katy Rittle, and David Conway, May 7, 2020 and from an unpublished "CWP Concept Paper" provided by Earl Buford.

¹⁸ On the MC3 and the Pittsburgh "Intro to the Construction Trades" curriculum, see the profile of the Energy Innovation Center Institute construction program in "An Inventory of Pre-Apprenticeship Programs," p. 29.

take non-union construction jobs, but a data base and tracking system that maintains contact with participants after they finish the program leaves open the potential for career advancement at a later date into the unionized sector.

As of spring 2020, six cohorts of participants had completed the program in its first two-plus years.

The Southwest Corner LWDB has also established strong connections to unionized apprenticeship. The Carpenters union reverse refers people to the LWDB individuals from its three counties who are eligible for Title 1 of WIOA because their income is under 200% of the poverty line, they are dislocated or face a barrier, or eligible for training using a grant aimed at addressing the opioid epidemic. Three other unions, the Insulators, Sheet Metal, and Operating Engineers have also begun to work with the LWDB in the same way. In the last year before COVID, about 10 people entered apprenticeship through this reverse referral and the LWDB spent about \$100,000 in individual training account dollars or \$500 for tools, boots, or other qualified apprentice out-of-pocket costs.

A Prisoner Re-entry Career Pathway in Reading

Rebuilding Reentrants and Reading (R3) emerged out of a more traditional workforce preparation program for the re-entry population operated by BCPS (Berks Connections/Pretrial Service, <https://www.berksconnections.org>).¹⁹ R3 launched in 2017 with a \$1.24 million U.S. Department of Labor Reentry Project grant, one of 14 nationwide and the only award in Pennsylvania. The three Rs in the name comes from fact that the program Rebuilds the lives of Rentrants in the city of Reading.

In the proposal to USDOL, the program managers and partners modified an existing prisoner reentry program in several important ways. They inserted an “evidence-based cognitive curriculum” developed at the University of Cincinnati into the classroom education component of the program. This curriculum, delivered by BCPS’s own staff, aims to “change how people think, and their values,” focusing on topics such as developing healthy relationships, dealing with drug and alcohol dependency, and the benefits of home ownership. This is a demanding and labor-intensive curriculum of 32 sessions with substantial homework.

Second, guided by the Berks County Workforce Development, R3 managers linked the program to the skill demands of local industry. More specifically, training prepared participants to work in the local construction sector, then facing skill shortages because of the retirement of older workers, and offering family sustaining wages.

Third, the program combined work-based and classroom education. Reading Muhlenberg Career and Technology Center (RMCTC) delivers the construction-related classroom instruction and Habitat for Humanity Berks County (HFHBC) and Neighborhood Housing Services (NHS) oversee the hands-on learning at housing rehabilitated in blighted Reading neighborhoods for veterans and their families. A job site supervisor/mentor accompanies participants to the work sites. A year into the program, with help from Pennsylvania’s Apprenticeship and Training Office (ATO), R3 further strengthened its connections to employers by making it a formal registered “pre-apprenticeship” program leading into one of seven area apprentices operated by the Keystone chapter of the Associated Builders and Contractors (ABC), an association of non-union employers. ABC added a blueprint reading section to the curriculum, which it delivers. R3 graduates are granted six months credit toward an ABC apprenticeship.

¹⁹ This case is based on an interview with Peggy Kershner, Nikki Shnovel, and Rory Peterson, April 3, 2020 and on information at [this embedded link](#) online.

Following an orientation to meet the staff and instructors, the first cohort of about 16 participants—most of them 25 and over—began training on October 2, 2017. The program lasts eight weeks, has two to three sessions per day for a total of 5-6 hours, with participants receiving a stipend of \$2,000 at the end of the program if they graduate. The program includes a “job shadow” at an employer. For the first four or five cohorts, R3 used exclusively R3’s own re-entry clients. Now, it takes referrals from county parole, a residential drug and alcohol center with returning citizens, and some other groups. Some participants end up being placed in manufacturing. Now a popular program, R3’s recent cohorts have about 24-25 applicants for the 16 slots.

After completion of the training, R3 staff provide case management, mentoring, and support for one year following graduation, including financial literacy, and coaching, job search, placement, and retention support. BCPS partners with area employers to connect R3 graduates with employment opportunities. An Employment Development Specialist works closely with employers and provides support after placement for a year to increase retention rates.

The program’s combination of best practices—classroom learning, hands-on experience, and cognitive interventions—has so-far delivered promising outcomes: 133 individuals completed R3 between October 2017 and December 2019; 74% of graduates maintain stable employment with a recidivism rate of only 7%.

The program has not yet achieved the goal of having participants enter apprenticeship. The Keystone Chapter of ABC is headquartered in Lebanon and a lot of member employers are in Lebanon and Lancaster. This makes transportation a challenge for anyone in Reading without a car—and some of these participants have suspended licenses. In addition, participants can often earn \$22-\$24 per hour immediately in non-apprentice positions, above a typical starting apprentice rate. Not acquiring an apprenticeship credential, however, could reduce participants long-term employment security and career prospects.

Opportunities to further strengthen the program include: screening participants up front based on their interest in and aptitude for success in apprenticeship, and with employer participation in selection to give businesses more ownership of participant success; engaging additional apprenticeship sponsors, including joint labor-management construction apprenticeship programs which have higher completion rates, including for women and minorities, and also higher exit wages;²⁰ and a more concerted approach on the transportation issues, including efforts to help more participants obtain a driver’s license.

Pre-Apprenticeship Career Pathways

The Keystone Research Center inventory of pre-apprenticeship in Pennsylvania profiles eight other examples of one particular kind of career pathway—pre-apprenticeship programs.²¹ (This is in addition to the aforementioned Hershey program and an Energy Innovation Center program that pioneered the “introduction to the trades” mentioned in the profile of the Pittsburgh Construction Workforce Partnership.) These programs include five in manufacturing, an additional construction program, an agricultural maintenance technician, and an information technology pre-apprenticeship. (Hershey school runs three separate programs, so there are more pre-apprenticeships than case studies.) A forthcoming KRC report on pre-apprenticeship will profile additional programs, including several apprenticeships

²⁰ Stephen Herzenberg, Diana Polson, and Mark Price, “Construction Apprenticeship in Pennsylvania,” Capital Area Labor-Management Council, Inc., 2018.

²¹ See Keystone Research Center, “An Inventory of Pre-Apprenticeship Programs Across Pennsylvania,” January 7, 2019, pp. 35-36.

serving non-traditional occupations (e.g., in health care and childcare) and apprenticeship participants (i.e., women and people of color). The discussion that follows draws on these other examples as well as the interviews explicitly for this career pathways project.

Reflections Based on Career Pathways in Practice

This section surfaces recurring reflections on career pathways in practice that emerged from our interviews.

Non-Linear Career Trajectories

Many practitioners and policymakers point out that the career trajectories of adults in the labor market are often not linear, some highlighting with a smile that they would not want to diagram how they got to their own current job in workforce development or education. In some sectors, such as health care — which has many occupations recognized industrywide, some backed by regulation—career ladders or lattices are more predictable and standardized. This simplifies the process of creating new career pathways, including apprenticeships and pre-apprenticeships, to help people advance. For example, the University of Pennsylvania in 2014 created three tiers of patient representative, a progression that creates a possibility of upward mobility (to higher tiers requiring some basic clinical skills and the abilities to complete paperwork and collaborate with social workers) replicable also in some other health care providers. Widely uniform occupations do not eliminate challenges to advancement in health care that result because education and credentials required at higher levels may be far above the current credentials of people who hope to advance. For example, it is a big jump from Nurse Aides that requires only a high-school degree to Licensed Practical Nurse (LPN), which ordinarily requires an Associate’s Degree—which is why Middletown high-school students who understand at age 18 the size of the jump, and have a plan for making it, have a better chance to advance than many older adult CNAs long out of school. But if the requirements to advance are well known and resources are available for long-term training, some adults as well young people with a plan can bridge significant gaps—moving from vocational nurse to registered nurse in Philadelphia-area health care, for example, with the support of training from the 1199C Training and Upgrading Fund affiliated with the National Union of Hospital and Health Care Employees and its employers.

Multi-employer career pathways for adults are harder to map out in manufacturing—and thus harder to develop advancement plans for—because of its enormous heterogeneity. Product and process variety contribute to variations in occupational titles, job definitions, and mobility paths across companies; and even companies that make similar products with similar processes may label occupations and group tasks into jobs differently. In addition, manufacturers often need only one or two people at a time; and if you combine people from multiple companies, their core training needs may differ.

In agriculture as well as manufacturing, “career pathways are not vertical, they are more lattices” said one agency workforce development specialist, adding that agriculture also does not have many certifications that can help people progress. “Farmworkers operate farm equipment and take care of animals. They can become dairy herdsman or shift into the free-range poultry industry. A lot of times the skills go horizontal. Career lattices are rather flat. People who start as farmworkers do not end up on top; and college educated workers did not start at the bottom.”

Many interviewees also pointed to the substantial degree of inter-industry mobility in the real world. One LWDB director in a highly populated suburban county said “A county like ours has so many different industries. People here can go from industry to another, especially if they have those technology skills. There’s no clear career pathway for that.” Another interviewee said: “A lot of people talk about career pathway—but I’m a bit iffy. Career pathways are not predictable. In engineering, you could go a million

different ways.” His statement evoked bugs on the surface of a pond darting out in every possible direction.

An agency program head added: “We think of career pathway as linear. In my experience, it is more of a lattice approach—multiple roads. Young people don’t know what they don’t know about jobs and careers—when they develop a passion, they may go right or left.” She hoped that “in 10 years” people have “...a more robust understanding that there are often career bushes and recognize employability skills as more than soft skills and including critical thinking. We need to help people understand lateral movement: you may not have to go back to the beginning.”

Career Pathways: a Tool for Planning Ahead and Avoiding Dead Ends

The disordered and unpredictable reality of adult career trajectories led some interviewees to worry that “career pathways” communicates a misleading sense of predictability. More interviewees, however, saw the concept of career pathways as having benefits that outweigh concerns about its accuracy as a description of the job market. Particularly for low-income or other vulnerable populations—with limited family supports and financial resources and no margin to go into debt for college or training that do not pay off—there is an urgency about training leading to a higher-paying job. In addition, career pathways can get people who might get stuck in a low-wage job to think about how they might progress over time. Most ambitious, some interviewees perceived a goal of career pathways as helping people become their own career coach so they can exercise “informed choice:” i.e., gain an understanding of jobs, employers, and the social process of advancement sufficient to enable them to make smarter choices about which jobs to take, when to change employers—and when not to because promotion often comes to those with longer tenure at individual employers—and which education and training to pursue.

Other Ways to Win

One dimension of “informed choice” highlighted by several interviewees was that there are “other ways to win” besides going to a four-year college. These interviewees pointed out high tuition and living costs can saddle young people with significant debt but does not guarantee a good job. At the same time, the retirement of the baby boom is creating high-paid openings in many “middle-skill” jobs. Career pathways provide a tool that allows young adults and their parents to analyze all their choices, including in these middle-skill jobs, with more information.

A business representative said: “My passion has been helping students realize that there are alternatives to the traditional college path. Monday night at our annual dinner, an employer said to me ‘I have five applications for a CNC machining job versus 100 for an accounting position.’ Post-secondary education is important, but all options should be on the table.”

Interviewees said that a bias in high-schools still exists towards four-year colleges, even though, as discussed below, career and technical education has regained status and respect in some areas in the past decade. The business representative again: “A college scholarship recipient wanted to be an electrician, but her guidance counselor talked her out of it. She was ‘too smart to not go to college.’ A Penn College Fresh Air child from New York City wanted a career in what turned out to be Mechatronics. A guidance counselor pointed her to Lycoming College, the most prestigious of the colleges to which she applied, even though it had no mechatronics program. Only 33% of jobs require college.”

A business leader with a manufacturing plant in North Central Pennsylvania said “one of the biggest Ponzi schemes out there is convincing parents to get a four-year college degree. We need to educate kids on the opportunities in manufacturing. Many will pile up college debt and end up working in customer service.” He was appreciative that his local school superintendent supported a course called “A Taste of Manufacturing” which bused school students to Luzerne County Community College for exposure to machining, 3-D printing, and welding plus a tour of a local company, Cornell Iron Works. Students gain college credit and a certificate in electronics or welding, a tangible skill. “The biggest obstacle is parents thinking that there’s only one way for their children to succeed.”

Even in a suburban Philadelphia county with a highly regarded and oversubscribed CTC, a CTC administrator said, “the focus on the college track is 100% true in this region. Many kids here are not cut out for college. But that is still the message from on top. Kids after college come back to us and then find out about the building trades but have lots of debt.”

Some interviewees did see a shift towards recognition of “other ways to win” because of three factors. Increased awareness of the high student debt of many who attend college. The increased awareness of non-four-year college paths that has resulted in part because of WIOA’s embrace of career pathways. Third, increased respect for the work of Career and Technical Centers. One administration said: “The speed at which technology is changing has created a new job market. My generation and older ones have an awareness problem in terms of the current job market. We grew up in a world in which CTE and CC programs had a stigma. Now those programs are true workforce development programs. We need to better brand family sustaining jobs in construction, manufacturing, even agriculture.” He closed, however, by echoing the view that many parents’ views remained unchanged and that our culture undervalues working with your hands as well as your head. Instead of a high-tech farming sector, “parents still have a view of going out and milking the cows by hand.”

The Foundation for Effective Career Pathways: Connections to Employers

Within all variants of career pathways, wide recognition exists of the crucial need for strong connections to employers. These connections make it possible to transcend the historic separation of education and training from work. Business connections provide firsthand knowledge of jobs and careers so that curricula are up-to-date with industry. In younger grades and more exploratory school career pathways, business connections can yield workplace visits and job shadowing opportunities. By the latter part of high school or in programs for postsecondary students or other adults, employer connections can yield employment (sometimes paid) in internships, co-ops or pre-apprenticeships, summer jobs, formal mentoring by from experienced workers, guidance from industry insiders on how to get job, and opportunities to apply for and secure permanent jobs. In some cases, business connections identify teachers from industry to deliver related instruction (in apprenticeships) or other classroom training (in other programs). Business connections can also produce opportunities for teachers to work in industry—as in “educator in the workplace” programs emphasized at Middletown and in Berks County—to gain or refresh “real-world” knowledge.

Even today, the employer connection is missing from many education and workforce programs. According to one business representative: “Guidance counselors aren’t connected enough to employers to know who fits where. They cannot help kids make decisions. We talk about removing silos, but it’s disheartening that education is still tightly wrapped in a silo.”

This critique still exists within adult workforce training too. A CareerLink staff member [Adina Taylor] said “a lot of lot excellent training programs are run by excellent people, they are great supply side

programs, but there's a disconnect with employers. When a person is work ready, there should be strong employer engagement there. A lot of programs, it is not clear where people should go when they finish training. Pre-apprenticeship to apprenticeship, the connection is there."

The challenges of connecting with employers is more difficult with small firms, a well-known challenge which has led to interest in "intermediaries," such as industry partnerships and group apprenticeships, that can enable employers collectively to define their needs and coordinate with educators and trainers. One apprenticeship coordinator said: "In information technology, small-scale proprietorships wonder if apprenticeship is the best way to bring on new employees. We need a group model; schools that do technology training should create apprenticeships."

Despite continuing challenges, universal agreement exists on the value of connections to employers. Said one CareerLink employee "if we can create alignment between business interests, educational interests, and families, then we have a winning recipe." In addition, most interviews perceived progress recently with overcoming the traditional disconnect between education and training and the economy. "Some school districts are aligned with career education from kindergarten on, others not so much. Connections between schools and employers allow discovery models to take place in high school. As a result, what teachers and guidance counselors tell students connects to the workforce needs of regional industry." One manifestation of stronger connections to employers has been in the definition and validation of career pathways. When that validation happens, and frontline CareerLink staff are trained on the use of a career pathways toolkit, they utilize it with "participants walking through the door."

The Central Pennsylvania Workforce Development System has invested significant effort in mapping career pathways in businesses, including to help TANF and WIOA in-school youth understand what the careers are in the area. "We have a website called <https://pathtocareers.org/>. It allows a business to say, 'here's what we do' in an accessible way; and 'here's how you prepare; we'll do job shadowing, industry tours, visit your classroom.' The students say, 'I want this.' The teacher vets the selection then the request goes to the business—it's been a long process working out the bugs in the website, but we hope it can lead to better-informed decisions."

Many business leaders, for their part, express willingness to engage. [Allen Norton] again: "Our take is the business community needs to lead the way; where you see pockets of success, the business community is leading the way."

For multiple stakeholders—as for Governor Wolf—one tried-and-true approach to cementing the employer connection between education and training and employers is apprenticeship. If the related instruction and/or a feeder pre-apprenticeship program is embedded in an educational institution, then the connection of education to the economy is also solidified.

The state's new "Navigator" apprenticeship teaches workforce practitioners everything they need to know to help grow high-quality apprenticeship, including about pre-apprenticeship. One apprentice said: "pre-apprenticeship, the light went on. Pre-apprenticeship works like a cobweb—feeding into one or more apprenticeships. Converting career pathways programs into a pre-apprenticeship gives them more structure and accountability. It is a strong sell for many employers—a term they can understand once they have it explained, plus many employers already run apprenticeships. I hope apprenticeship will grow and then pre-apprenticeship will become an obvious go-to." He added: "It's a one-two punch. The more employers embrace apprenticeship, the more it makes sense for the state to fund pre-apprenticeship." And later: "boot camps should be pre-apprenticeships that lead to apprenticeships, not boot camps."

A growing number of pre-apprenticeships are delivered in Pennsylvania high schools. In Beaver County, for example, CTC students can take the classes for a manufacturing apprenticeship run by the German-American Chamber then go to work from 3-7 pm. Says a LWDB director, “it’s a beautiful design. The schools are committed to making that connection.”

Box 5: Occupations Ripe for Establishing/Growing Apprenticeship

Many Pennsylvania business, labor, workforce, education—and government—stakeholders today speak glowingly about apprenticeship. They like the potential for students to “learn and earn” and avoid college debt, the integration of classroom and work-based learning, the curricula designed to develop skills needed by high-performance job holders, and the potential connection apprenticeship and pre-apprenticeship create between businesses and educators and trainers that deliver related instruction. Many stakeholders also see many examples of non-traditional and new occupations in which apprenticeship and pre-apprenticeship could establish a foothold or grow beyond pilot programs that exist today.

- In agriculture and agro-forestry, the Pennsylvania Association of Sustainable Agriculture (PASA) and the urban farming non-profit Grow Pittsburgh are developing a pre-apprenticeship to apprenticeship pathway for “diversified vegetable growers” that could open up careers for diverse workers. PASA has also proposed a Dairy Grazers pre-apprenticeship.
- In Philadelphia, OIC of America serves as the group sponsor for a “micro-brew support apprenticeship” targeting the re-entry population. This aims to create a trained, loyal workshop for a booming industry who would have opportunities to advance in the industry and, potentially, become entrepreneurs. The passage from trades worker to employer has a centuries old tradition globally in the trades, one still alive and well today.

Other interviewees identified other career pathways that could lead to high pay and meet employer demands, with or without apprenticeship and pre-apprenticeship to carry people along the pathway. Examples included construction inspector in construction zones and geographic information systems (GIS), an occupation within which a university program that started in response to industry demand has grown substantially and now includes the potential to earn a four-year degree. Two other examples.

- A Pennsylvania LWDB direction sees a “easy” career pathway from van driver to EMT to advanced EMT to para-medic to registered nurse. This could provide opportunity for some of the thousands of people trained with public dollars to acquire a Commercial Drivers’ Licenses (CDL) each year, but who then find the hours impossible or become trapped as independent contractors.
- A business leader said real-world pathways, with advancement potential, exist in freight and logistics. “You can start as a deckhand and in five years make six figures as a captain. And the employer pays for some of the education along the way.”

The Continuing Importance of Company-Specific Career Ladders

Another theme that emerged from interviews with business representatives was the continuing importance of career advancement within companies. An executive at a major health care employer described the company's own recent realization, as the pre-COVID labor market tightened, that it made sense to build its own talent pipeline: that would cost less than hiring talent on the outside market and people promoted would stay longer. In addition, the company could hire people in rural areas from high-school but then offer people in "our own communities" advancement and a stable career. The company concluded that typical workers could have three-to-five progressions in their career, with intermittent periods of education and experience, or a mix of the two, and gradual advancement. The education along such pathways is sometimes supported by employers through training delivered on the job or reimbursement delivered off it. People "see a real, clear, transparent way through the maze." One of the "pain points" that led the company to strengthen its internal job ladder: nursing vacancies and the high cost of agency nurses. In response, career pathways have become a central complement to the company career ladder. We "looked at how we can create more of a pathway. With coops in the high school, student nurse externships, student nurses, it creates a nice pipeline. Nursing assistants can go back to school then come a registered nurse with us. It pays off for us, having a lot more hires through internal growth and promotion."

A manufacturer, also in a rural area, told a parallel story. Prior to COVID, the company did a deep dive within its industry partnership on why manufacturers face a recruitment crisis. The group's diagnosis highlighted some familiar external factors: "It's a college-for-all world. There's mis-information that manufacturing is dirty and poorly paid. Too many students are just doing what they are being told. Changing these perceptions is not a quick fix. It is a long-term generational thing. Especially in skilled trades, we will be in crisis mode for 20 years."

The company also looked at some internal factors: "we concluded we had to do things differently ourselves. More internships, job shadowing, scholarship opportunities—building relationships with young people. Get them used to our name. Maintenance mechanics make \$25 to \$50 per hour without a college degree. One thing we run into and career pathways could help with is talking to kids who do not know about manufacturing. In health care—RN, phlebotomist, there's common nomenclature. In manufacturing, there's maintenance tech, industrial technician, other names. And young people don't know what these occupations mean."

Policy

Current Policies that Support High-Quality Career Pathways

Several current policies in Pennsylvania support high-quality career pathways.

- The Wolf Administration’s development of the [Future Ready PA Index](#), and the incorporation in the index of [Career Readiness Standards](#), have elevated career readiness as a goal of Pennsylvania’s public schools. They communicate that schools should not just focus on four-year college but help all students succeed in college AND career.
- Pennsylvania’s tradition of industry driven education and training indirectly supports high-quality career pathways by strengthening the collective voice of industry and fostering industry driven partnerships and intermediaries that can partner with educators, trainers, and the workforce system. In the Wolf Administration, with support from the legislature, investments in apprenticeship and pre-apprenticeship, and restoration of some funds for industry partnerships, have strengthened partnerships with industry that provide a foundation for effective career pathways.
- The Pennsylvania [teacher in the workplace](#) connects educators with local business leaders and employers. It enables teachers to visit local employers, learn about industry trends and skill requirements, and industry trends, and keep their curricula up to date.
- PAsmart has also created 10 dynamic new “STEM (Science, Technology, Engineering, and Math) ecosystems,” that could help spread career pathways linked to STEM careers. This dimension of PAsmart takes place within a broader state and national movement that has rediscovered the power of “learning-by-doing,” including in higher-paid professions—a context conducive to more universal acceptance of concepts like CTE for all and Career Pathways for all.

Challenges to Scaling High Quality Career Pathways

- Employer and industry association capacity to engage with educators and the workforce system: the “free rider” problem
- Policies that support experimentation but not systems change
- Job quality: the lack of respect for all work and all workers
- Funding

Towards an Industry-Driven, Worker- and Student-Centered Vision

- Develop a common definition of career pathways and common definitions of how concept is operationalized in schools, for adults, and with different vulnerable groups
- Institutionalize industry driven education and training—scaling sectoral strategies and high-quality career pathways
 - An industry partnership and group apprenticeship tax credit
 - Make IPs/group apprenticeships employer representatives on curriculum committees
 - Scale the RA Navigator apprenticeship and other capacity development and peer learning for workforce intermediaries
 - Consider recreating the Center for Health and Center for Advanced Manufacturing Careers and other industry Centers, leveraging private and philanthropic funds—use these to identify and disseminate best practices for career pathways, industry partnerships, and group apprenticeship practices; and competency models and curricula (building on experience within CTE)
- Promote CTE and career pathways for all, with work experience and education more deeply integrated starting with high school

- Create a statewide system of post-secondary education in PA, leveraging federal funds
- Dashboards: measure and monitor progress to drive the team effort to improve
- Achieve Gov. Wolf's goal of integrating workforce programs across agencies
- Engage stakeholders—including education and training professionals—in fleshing out a vision and implementation plan

Appendix A: Interview Questions and Interview Guide

Interview questions specified in the scope of work.

- Gather information on how each local board currently defines career pathways (compare/contrast state vs. local definition), including:
 - Capture of information regarding which local workforce partners and stakeholders have been involved in the development of each local board's career pathways definition (e.g., workforce, education, labor, etc.)
- Confirm whether there has been engagement with higher education, including community colleges, around career pathway development
- Specify whether the local career pathways definition varies when considering youth vs. adults
- If career pathways have been developed locally, specify how many of them are industry-specific vs. less specific (more general/broad)
 - Identify specific industries represented
- Document whether the career pathways that each LWDB is designing place emphasis on providing access to those with substantial barriers to employment
 - If so, document how this is occurring; or why it is not emphasized
- Gather information regarding how pre-apprenticeship and registered apprenticeship programs are incorporated in the way each LWDB develops their career pathways approach
 - Document any promising practices in measuring outcomes and tracking the success of participants in pre-apprenticeship and registered apprenticeship programs; and for career pathways, in general
- Collect suggestions for specific ways that the Commonwealth can support the development of strong career pathways statewide
- Determine how LWDBs have engaged their industry partners in understanding, defining, and validating career pathways and critical occupations in the targeted industry, including
 - How LWDBs are engaging with employers to determine the requirements for career pathway programs around specific industries and occupations
- Capture how local areas are engaging with employers to determine the requirements for career pathway programs around specific industries and occupations
- Gather information on how WIOA Title II partners contribute to the local career pathways strategies, including development and implementation
- Gather information on how WIOA Title IV partners contribute to the local career pathways strategies, including development and implementation
- Collect summary of any anecdotal success stories or challenges around career pathway development, overall
- Solicit any other information each LWDB would like to share related to career pathways

Interview guide

Background in education and workforce development.

Specific familiarity with career pathways.

Concrete examples of career pathways locally.

Are there concrete career pathways elsewhere in the country that you see as models?

What specific challenges do you see career pathways as aiming to overcome? (Probe for Pennsylvania examples of programs that overcome each change.)

Beyond addressing those challenges, what do you see as other goals/potential strengths of career pathways? (Pedagogical, connection to jobs/careers, help students to see the first job as a steppingstone to further educational and career advancement.)

What different partners do you think should be engaged in an effective career pathway (e.g., K-12, higher education, employers/Industry Partnerships)

Do you perceive others as defining career pathways differently than you do? Can you describe the main different ways of thinking about CPs and what communities do you associate with each (e.g., education, workforce)?

Are career pathways primarily important for youth, for adults, or for both? Are there differences between effective career pathways for youth and adults and, if so, what are those differences?

Among youth, are career pathways particularly important for and/or should they differ for opportunity youth/youth with barriers and other youth? Same question for adults.

Are you familiar with pre-apprenticeship and apprenticeship programs in your area? If yes, how do/should pre-apprenticeship and apprenticeship incorporate career pathways and what benefits does this yield over and above “traditional” pre-apprenticeship and apprenticeship?

One of the traditional criticisms of education and some training programs has been their lack of connection to employers. Do the career pathways you know on the ground in Pennsylvania have connections to employers? Please describe specific examples.

Many jobs, including a high proportion of the jobs of new labor market entrants, pay low wages and benefits, sometimes with unpredictable hours and schedules. Should career pathways connect to these jobs? Do career pathways have any potential role in improving these jobs?

Economists have documented that wide variations exist in job quality within industries and sometimes within the same market segment (e.g., Trader Joe’s and Costco vs. Weiss and Walmart). Should career pathways seek to educate students to recognize this variation and seek employment at employers with better jobs? Which partners should provide information about good employers in the region?

What suggestions do you have for specific ways that the Commonwealth can support the development of strong career pathways statewide?

The Commonwealth would like to gather profiles of effective career pathways, of individuals that have benefitted from stronger career pathways, and of employers that have helped provide connections to jobs. What career pathways would you recommend profiling? Do you have suggestions of who might know individuals or employer representatives that could be profiled?

Do you have a vision of how career pathways should fit into the Pennsylvania educational system and labor market 10 years from now?

What else should I have asked you?

Is there any person in Pennsylvania who jumps out at you as someone we should interview for this project?