A Guide for the Development of Aligned Career Pathways Systems

DECEMBER 2015
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ABOUT THIS GUIDE

This guide is intended to help state and local Career and Technical Education (CTE) systems to align their work on Programs of Study (POS) with parallel state and local efforts on the development of Career Pathways systems. The paper identifies similarities between these initiatives; the steps that some states are currently taking to align and integrate this work; the lessons they are learning in doing so; and the value they are realizing through their efforts. The guide also shares lessons learned from the states that participated in the Department of Education, Office of Career, Technical, and Adult Education’s (OCTAE) Advancing Career and Technical Education in State and Local Career Pathways project (Advancing CTE in Career Pathways) as they worked to develop and integrate CTE POS and Career Pathways efforts.

WHO SHOULD READ THIS GUIDE?

This Guide is targeted to state and local CTE system leaders, practitioners, and stakeholders, as well as other system partners who are looking for ways to leverage their expertise, resources, influence, and reach in preparing students for postsecondary credentials and careers in high-demand industries and occupations.
I. INTRODUCTION

The number of U.S. jobs requiring postsecondary education and training is expected to reach a new high of 65 percent in 2020. The Center on Education and the Workforce (CEW) at Georgetown University estimates that postsecondary certificates result in a 27 percent earnings increase for men and a 16 percent earnings increase for women over high school diploma holders; and these salary figures increase substantially when people work in their fields of certification. However, CEW projects that the United States will face shortages of three million workers with Associate’s degrees or higher and five million workers with technical certificates and credentials by 2020.

A recent Business Roundtable survey of 126 CEOs found that 60 percent of today’s job openings require basic STEM literacy and 42 percent require advanced STEM skills. However, 28 percent of the employers surveyed said that at least half of new entry-level hires lack basic STEM literacy and 62 percent of the employers reported problems finding qualified applicants for IT jobs. 97 percent of the CEOs reported that the skills gap is a problem. Over the next 5 years, employers will need to hire nearly one million employees with basic STEM literacy and more than 600,000 employees with advanced STEM knowledge.

Across the country, education and workforce development systems are responding to increasing employer demands for academic, employability, and technical skills in their employees. As postsecondary credentials have become the key to a middle class standard of living, there is increasing pressure to build Career Pathways systems that will help students more efficiently attain the education, skills, and postsecondary credentials necessary for high-demand, family-supporting careers.
II. CTE PROGRAMS OF STUDY

Program of Study

A program of study is a comprehensive, structured approach for delivering academic and career and technical education to prepare students for postsecondary education and career success.

The 2006 reauthorization of the Carl D. Perkins Career and Technical Education Act (Perkins IV) emphasized the importance of aligning secondary and postsecondary CTE programs so that young people can move efficiently to and through postsecondary education and training to credential attainment. Perkins IV called on states to offer Programs of Study for students participating in CTE and required that each local recipient of Perkins IV funding offer at least one POS that, at a minimum:

- Incorporates and aligns secondary and postsecondary education elements;
- Includes academic and CTE content in a coordinated, non-duplicative progression of courses;
- Offers the opportunity, where appropriate, for secondary students to acquire postsecondary credits; and
- Leads to postsecondary certificates, industry-recognized credentials, or Associate’s or Baccalaureate degrees.iv

In an effort to further encourage the development of rigorous POS and help CTE systems create more structured pathways to postsecondary education and careers in high-demand occupations, OCTAE, working with national, state and local stakeholders, established a framework (Figure 1) that identifies 10 components essential to successful CTE Programs of Study. This framework has helped many state and local CTE systems to build POS that are comprehensive and result in positive outcomes for CTE students.
Figure 1. Programs of Study (POS) Design Framework

PROGRAM OF STUDY DESIGN FRAMEWORK
“A program of study is a structured sequence of academic and career and technical courses leading to a postsecondary-level credential.”
- Operational definition

LEGISLATION AND POLICIES

PROFESSIONAL DEVELOPMENT

SECONDARY LEVEL

COLLEGE AND CAREER READINESS STANDARDS

CURRICULUM AND INSTRUCTION

GUIDANCE

COURSE SEQUENCES

CREDIT TRANSFER AGREEMENTS

ADVISMENT

POSTSECONDARY LEVEL

PROFESSIONAL DEVELOPMENT

ACCOUNTABILITY

EVALUATIONS

ASSESSMENTS

CREDENTIALS
III. CAREER PATHWAYS

As CTE Programs of Study have evolved, Career Pathways systems have also emerged as a very promising strategy for formally aligning the education, workforce, and supportive services needed to guide a wide range of individuals through the continuum of education and training coursework necessary for credential attainment and family-supporting careers. Career Pathways are especially effective for helping underprepared students, jobseekers, and workers access and complete the credentials they need for high-demand jobs.

In April 2012 the three Departments of Education (ED), Labor (DOL), and Health and Human Services (HHS) defined Career Pathways as “a series of connected education and training strategies and support services that enable individuals to secure industry-relevant certification and obtain employment within an occupational area, and to advance to higher levels of future education and employment in that area.”

In their effort to provide guidance, the Departments agreed upon a joint framework for developing and implementing Career Pathways systems and identified Six Key Elements (Figure 2) or actions that states and local communities can take to build Career Pathways systems.

Figure 2. Career Pathways: Six Key Elements
On July 22, 2014, two game-changing actions were taken to further encourage the establishment of Career Pathways systems: Congress enacted the Workforce Innovation and Opportunity Act (WIOA) and The White House issued Vice President Biden’s *Ready to Work: Job-Driven Training and American Opportunity* report.

WIOA requires state and local workforce development systems to focus on:

- Cross-system alignment, strategic planning, performance measurement, and data collection/utilization;
- Training for in-demand industry sectors and occupations;
- Use of labor market information (LMI) to identify in-demand industries and occupations;
- Career Pathways system development efforts that connect workforce, adult education, postsecondary education, and other partners to establish education and training systems that enable a range of individuals to secure industry-relevant certifications and employment in high-demand industries and occupations; and
- Increased services to out-of-school youth—requiring that 75 percent of youth funding be dedicated to serving out-of-school youth—with an emphasis on connections with postsecondary education and Career Pathways approaches.

The Vice President’s *Ready to Work* report details a similar set of actions that the United States can take to grow the economy and allow the American middle class to fully reap the benefits of the country’s new economic opportunities. These evidence-based strategies are outlined in the *Ready to Work* as part of a *Job-Driven Checklist*. A comparison between the Career Pathways: Six Key Elements and Job-Driven Checklist is shown in Table 1.
<table>
<thead>
<tr>
<th>Career Pathways: Six Key Elements</th>
<th>Job-Driven Checklist:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Build Cross-System Partnerships</td>
<td>✓ Regional Partnerships.</td>
</tr>
<tr>
<td>2. Engage Employers/Identify Key Industry Sectors</td>
<td>✓ Engaging Employers.</td>
</tr>
<tr>
<td>3. Design Education and Training Programs that Meet the Needs of Participants</td>
<td>✓ Opening Doors. Break down barriers to training and hiring; provide job supports and guidance.</td>
</tr>
<tr>
<td>4. Identify Funding for Sustainability and Scale</td>
<td>✓ Earn and Learn. Work-based learning, Pre-and Registered Apprenticeships.</td>
</tr>
<tr>
<td>5. Align Policies and Programs</td>
<td>✓ Stepping Stones. A seamless progression from one educational level to next.</td>
</tr>
<tr>
<td></td>
<td>✓ Measurement Matters. Measure and evaluate employment/earnings outcomes.</td>
</tr>
</tbody>
</table>
IV. IN SUPPORT OF ALIGNMENT

The frameworks and essential components of CTE POS and Career Pathways efforts are rooted in lessons learned from carrying out CTE and workforce-related education and training programs over the past 30 years. The earliest programs—including Career Academies, High Schools that Work, Tech Prep, and School-to-Work—tested strategies for helping youth transition from secondary education to postsecondary education and employment; aligning academic and occupational learning; and working closely with employers. Later programs—such as Breaking Through, Shifting Gears, Policy to Performance, and Accelerating Opportunity—focused on similar strategies for helping low-skilled adults attain postsecondary credentials and family-supporting employment. The history of CTE and workforce-related education and training programs is documented in *The Evolution and Potential of Career Pathways*, a paper developed in April 2015 through a contract with OCTAE for the Advancing CTE project.

CTE Programs of Study and Career Pathways have followed parallel evolutions. Because different statutes have shaped their respective reform efforts, delivery systems, funding streams, and targeted populations, CTE POS and Career Pathways efforts frequently function in relative isolation from each other. As seen in Figure 3, this disconnect is a missed opportunity.
Comparing Current Definitions/Frameworks

CTE POS and Career Pathways share common components, providing a helpful starting point for aligning system efforts.

Both Career Pathways and CTE Programs of Study include:

- Aligned secondary and postsecondary education;
- Connected, sequential, non-duplicative curricula, for both academic/basic education content and CTE/skills training;
- Opportunities to earn college credit and accelerate credential attainment; and
- Emphasis on attaining postsecondary, industry-recognized credentials.

Because CTE POS and Career Pathways initiatives often focus on different populations—particularly at the beginning of pathways—the frameworks for POS and Career Pathways are tailored to the needs of their targeted participants. However, differences between participants
tend to diminish as they progress along pathways. Even at the entry points, POS and Career Pathways can benefit from: cross-system partnerships; analyzing and sharing labor market information; aligning career cluster and sector identification and program development efforts; joint employer engagement strategies; coordinating counseling efforts; dually identifying needed policy changes; and sharing data and performance metrics. The following crosswalk (Table 2) highlights similarities and differences between the federally supported frameworks that have guided CTE POS and Career Pathways efforts.

**Table 2. The Crosswalk**

<table>
<thead>
<tr>
<th>Career Pathways (CP) Six Key Elements</th>
<th>Programs Of Study (POS) Ten Components</th>
<th>Common Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Build Cross-Agency Partnerships</td>
<td>#2: Partnerships</td>
<td>• Cross-agency partnerships include education, business, workforce, economic development and community stakeholders</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Common vision and goals</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Clearly delineated and agreed-upon roles/responsibilities for all partners</td>
</tr>
<tr>
<td>2. Identify Industry Sectors and Engage Employers</td>
<td>#2: Partnerships #10: Technical Skills Assessment</td>
<td>• Both CP and POS frameworks stress the analysis and validation of economic and workforce trends and adapting pathways accordingly</td>
</tr>
</tbody>
</table>
#3: Professional Development  
#5: College and Career Readiness Standards  
#6: Course Sequences  
#7: Credit Transfer Agreements  
#8: Guidance Counseling and Academic Advising  
#9: Teaching and Learning Strategies  
#10: Technical Skills Assessment

- Clear, non-duplicative sequences of course
- Opportunities to earn college credit leading to industry-recognized postsecondary credentials
- Credit transfer/articulation agreements
- Counseling, including career planning and academic advisement
- Support services, especially in CP
- Contextualization and modularization of curricula and mapping of pathways
- Integrated instruction of academic and technical content and acceleration (dual enrollment in POS; co-enrollment in CP)
- Instructional strategies that instill work readiness skills

#1: Legislation and Policies  
#3: Professional Development (policy implications)

- Emphasis on the role of federal, state, and local policies in promoting, sustaining and helping students access CP and POS services

#1: Legislation and Policies

- Braided or integrated investments from multiple funding sources to provide sufficient resources and sustain programs
- Importance of funding/investment to support professional development and other system development activities

#4: Accountability and Evaluation Systems  
#10: Technical Skills Assessment

- Importance of defining outcomes/measuring progress
- Processes for collecting, storing, analyzing, and sharing data
The following Figure 4 depicts several characteristics of integrated Career Pathways systems:

- Aligned CTE Programs of Study and adult-focused Career Pathways;
- Stackable credentials with progression aligned with increasing levels of employment; and
- Dual-Enrollment and Co-Enrollment strategies that accelerate credential attainment.

Figure 4. The Postsecondary Alignment of Programs of Study and Adult Career Pathways

![Diagram of Postsecondary Alignment of Programs of Study and Adult Career Pathways]
V. USING THE SIX KEY ELEMENTS AS A GUIDE FOR ALIGNING CTE POS AND CAREER PATHWAYS EFFORTS

In January 2013, five states—Colorado, Kansas, Massachusetts, Minnesota, and Oregon—were chosen to participate in the Advancing Career and Technical Education (CTE) in State and Local Career Pathways System project, a three-year initiative managed by Jobs for the Future through a contract with OCTAE. The project was designed to help participating states and local communities leverage the expertise, resources and energy of CTE POS and Career Pathways efforts, providing technical assistance to help the states integrate CTE POS into their broader Career Pathways system development efforts.

The following recommendations, based on lessons learned from this and earlier projects, are intended to help state and local CTE systems and partners align POS with state and local Career Pathways efforts, hereafter referred to as aligned Career Pathways. These recommendations are organized around the Career Pathways: Six Key Elements (aligned with the CTE POS 10 Essential Components) and include examples from the states that participated in the Advancing CTE project.


Element One

### BUILD CROSS-SYSTEM PARTNERSHIPS: CRITICAL FEATURES

- Cross-system partnerships and alignment of multiple programs are required for aligned Career Pathways systems, so that resulting education and training systems are capable of preparing a wide range of students, jobseekers, and workers for family-supporting careers in high-demand industries and occupations.

- Partnerships should include: education providers (K-12, CTE, Adult, and Postsecondary Education); regional workforce and economic development systems; human services providers; industry stakeholders (including employers and labor); community-based organizations (CBOs); and others as appropriate.

- Partners should identify and agree upon a common vision, mission, and goals for aligned Career Pathways systems.

**Recommended Actions:** To align CTE POS and Career Pathways efforts, CTE systems and partners should:

1. Identify the public and private partners key to developing and implementing Career Pathways systems in the state and region—and ensure all have a seat at the table.

2. Ensure that secondary and postsecondary CTE are represented on the Career Pathways team.

3. Inventory education and training resources and providers to determine their capacity and willingness to provide needed education and training for careers in high-demand industries and occupations, identifying gaps and needed changes where appropriate.

4. Bring partners together in support of a shared vision, mission, and goals for developing or enhancing aligned Career Pathways systems.

5. Agree upon the roles, responsibilities, and value-add for each partner in the development and implementation of an aligned Career Pathways strategy.

6. Identify a lead agency or individuals to coordinate day-to-day operations, convene system partners, broker training opportunities, and evaluate progress in achieving goals.

7. Identify areas where the CTE POS and Career Pathways systems can work as a whole in support of a comprehensive Career Pathways system that includes CTE POS.
State Examples

"By aligning efforts, we are working towards a more effective and robust statewide Career Pathways system that will strengthen Colorado's Talent Pipeline."
—The Colorado Workforce Development Council

When Colorado committed to developing industry-driven Career Pathways, it formed the Aligning Career Pathways Subcommittee of the Colorado Workforce Development Council (CWDC) to lead its work. The team of nearly 60 active members from multiple state agencies, industries, local education and workforce systems, community colleges, adult education, and K-12 systems in the state meets quarterly and contributes resources. As part of its work to highlight the need for a skilled workforce, the team created a Talent Pipeline Report, highlighting Career Pathways as a critical strategy for growing the talent pipeline and critical for student mobility.

In Minnesota, the Governor’s Workforce Development Council (GWDC) convenes state leaders—including representatives from business, education, workforce, labor, community organizations, and multiple states agencies—to lead the state’s workforce development efforts. (See the GWDC’s 2014 Policy Advisory, Building Partnerships to Overcome Barriers.) To carry out the state’s work on Career Pathways, the GWDC formed a standing committee that will focus on aligning the state’s multiple pathways—such as CTE POS and adult-focused initiatives—into a comprehensive effort. Minnesota crafted a one-page mission statement as part of the Advancing CTE project to achieve agreement on a common vision and goals for state Career Pathways efforts as well as communicate project work to state policymakers and system stakeholders.

“In our increasingly disruptive and knowledge-driven economy, Minnesota must support a robust human capital strategy to ensure its economic competitiveness, address growing disparities, and promote opportunity for business and workers alike.”
—The Minnesota GWDC

At the local level, the Career Pathways partnership in Rochester, Minnesota created a presentation called It Takes a Village to Create a Career Pathway System describing the local Career Pathways system and the essential role that partners play in its implementation. Partners from the secondary school district, postsecondary technical college, the workforce development system, and business delivered the presentation around the state. The same partners worked with the Mayo Clinic to create a robust career pathway in Health Care Sciences. To encourage high
school students to become interested in careers in health care, Rochester Public Schools (RPS) also developed the Health Science Career Center (HSCC) in partnership with the Mayo Clinic. A committee called Collaboration Among Rochester Educators (CARE), comprised of Rochester Community and Technical College (RCTC) and RPS staff worked to offer adult education students with opportunities to access training through the HSCC, with most of the students matriculating to RCTC Health Sciences pathways. Workforce Development, RCTC, and Adult Education providers developed an additional Health Science pathway with navigators, career counselors, and college credits for students who have never been successful academically.

When state leaders in Oregon met to align the state’s CTE POS and Career Pathways efforts, partners quickly realized that they had different ideas about what Career Pathways should look like in the state, and they were using different language to describe Career Pathways and related strategies. To work toward a common understanding of pathways, the marketing and communications subcommittee of the Oregon Career Pathways team created a glossary of terms. The glossary clarifies programmatic terminology commonly used by state educators, as well as summarizes state programs, strategies, and national initiatives related to Career Pathways efforts. The glossary also helped to structure cross-system Career Pathways messaging in Oregon.

To ensure the aligned management of and sustain Career Pathways efforts in the state of Kansas, the Kansas Board of Regents (KBOR) and the Kansas State Department of Education (KSDE) developed a Memorandum of Agreement (MOA) to create a joint position between the two agencies for overseeing pathways work begun during the Advancing CTE project.

Hampden County, Massachusetts used a Memorandum of Understanding to gain consensus on regional partners’ roles and responsibilities in establishing manufacturing Career Pathways in the region. The MOU also helps to set expectations, avoid mission drift, allow new partners to find easy points of entry, and provide a platform to access sustainable funding. The Regional Employment Board (REB), the local workforce board in Hampden County, convenes partners for these and other Career Pathways efforts.
Element Two

ENGAGE EMPLOYERS, IDENTIFY KEY INDUSTRIES, AND ALIGN SYSTEM WITH INDUSTRY SKILL NEEDS: CRITICAL FEATURES

- Employer engagement is essential to developing and implementing aligned Career Pathways systems.

- Employers are critical to identifying:
  - In-demand industries and occupations;
  - Competencies and credentials required for those industries and occupations; and
  - How students are deemed proficient in industry-recognized competencies and credentials.

- Employers must be actively engaged in designing and developing aligned Career Pathways systems and individual occupational pathways and programs.

Recommended Actions: To ensure that aligned Career Pathways systems meet the skill needs of employers in high-demand industry cluster/sectors, CTE systems and partners should:

1. Work with state and local workforce boards, economic development partners, employers, and other system partners to analyze and validate the most recent Labor Market Information (LMI) available and determine the employment and skill needs of high-demand industries and occupations in their states and regions.

2. Align CTE’s Career Clusters work with WIOA’s Career Pathways and Industry Sector development efforts to ensure that: all systems are using the same, most up-to-date LMI; training around career clusters is aligned with sector-based training at the postsecondary level; and students, jobseekers, and workers have access to the full range of high-demand careers available in their states and regions.

3. Carry out joint employer engagement strategies to strengthen employer outreach, minimize duplication of requests, and build aligned Career Pathways systems where employers help to:
   - Identify regional skills needs and gaps;
   - Determine the capacity of regional education/training providers to meet industry needs;
   - Identify/validate competencies and credentials needed for in-demand occupations;
• Design curricula and instructional strategies that meet industry needs, including employability skills;
• Provide opportunities for work-based learning;
• Provide input into and validate employers’ use of credentials in making hiring and other employment decisions; and
• Convene joint advisory committees/industry partnerships in or across high-demand industry cluster/sectors to carry out the above listed actions.

State Examples

“Career Pathways must emerge out of two ongoing conversations: one with employers in the target industry and one with the education and training institutions ultimately responsible for their development and implementation… Colorado’s Sector Partnerships are the vehicle for integrating these two conversations.”

—Creating Career Pathways in Colorado: A Step-by-Step Guide

As of December 2015, there are 14 sector partnerships in Colorado—as seen on this map—in varying stages of implementation. Sector Partnerships, as defined in Colorado’s Career Pathways guide, “bring together employers, at a regional level, from the same industry with the education, training and other community support programs needed to implement solutions and services that ensure the target industry thrives.”vi In addition to its Career Pathways guide, Colorado has also developed a sector partnerships toolkit for use by state partners. The state’s sector and CTE cluster work—carried out by the Colorado Community College System (CCCS)—is fully aligned.

The most robust sector partnership thus far in Colorado is the Northern Colorado Advanced Manufacturing sector partnership (NoCO). NoCO is comprised of more than 50 northern Colorado manufacturing companies and 20 public partners. NoCO is working closely with CCCS to establish statewide Career Pathways in advanced manufacturing based on its model and with the Denver Metro Healthcare Partnership to aggregate lessons learned from both partnerships for future dissemination.

To engage employers in the design and development of aligned CTE Programs of Study and Career Pathways efforts, the Kansas team, including KBOR, KSDE, and the Department of Commerce, developed an Employer Engagement Initiative. Community colleges were the first to
become involved, nominating employers at one of three levels of recognition—Supporter, Partner, or Champion—depending on their level of participation. Local school districts can now also recognize employers for working with local secondary CTE systems. The model recognizes employer contributions and helps to guide conversations and partnerships with employers in career pathways efforts.

In addition to the Employer Engagement Initiative, the Wichita region in Kansas established the **Regional Manufacturing Council on Technical Education (RMCTE)** that provides more than 30 manufacturers in the region with a coordinated voice to: advise the CTE and workforce development systems in south central Kansas on manufacturing education and training; and raise awareness among teachers, counselors, students, and parents about the variety of high-paying careers in the manufacturing industry. Council partners include the Wichita Manufacturers Association, the Workforce Alliance of South Central Kansas (the regional workforce board), USD 259 (the Wichita School District), and the Wichita Area Technical College.

“A much higher and deliberate level of collaboration is taking hold as cluster development and sector strategies are being implemented in the region…the Regional Manufacturing Council on Technical Education is an emerging industry partnership…RMCTE’s primary purpose is to promote the manufacturing industry and help grow the future workforce.”

—Keith Lawing, CEO, The Workforce Alliance of South Central Kansas

In **Hampden County**, the REB surveyed employers to assess the skill needs of the region -- carefully analyzing the data and converting results into a report providing practical recommendations for education and training providers. The REB’s philosophy for employer engagement begins with the premise that their work must be business/industry-led and that employers’ engagement will add value to their businesses. Employer engagement has been key in **Hampden County’s Precision Manufacturing Regional Alliance Project**, bringing 38 advanced manufacturing employers in the Pioneer Valley region of Massachusetts together with area education, workforce and economic development stakeholders to address a critical skills gap in technologically adept current and future workers.

“Employers must be engaged from the design stage forward, be willing to commit their time and—if necessary—resources, become vocal advocates—and ultimately champions—for the work, and must take the lead in any sustainability efforts.”

—Dave Cruise, Executive Director, Hampden County Regional Employment Board
To generate economic growth; improve the region’s education system; and improve the region’s transportation system, Minnesota’s Twin Cities formed the Itasca project, an employer-led civic alliance, in 2004. Itasca is comprised of over 50 private sector CEOs, the Governor, the Mayors of Minneapolis and St. Paul, County Commissioners, the Chair of the Metropolitan Council, leaders from the region’s Higher Education institutions, leaders from major foundations, and the United Way, among others. Itasca has worked with schools to make them more responsive to labor market needs; reviewed curriculum to identify misalignment; and provided input to strengthen instruction. The Rochester local partnership has agreed to pilot Itasca and the state is looking at Itasca as a potential structure for gathering employer input in Career Pathways system implementation.
## Element Three

### ENSURE PROGRAMS ARE DESIGNED TO ACHIEVE SYSTEM GOALS: CRITICAL FEATURES

- Aligned Career Pathways systems should:
  - Be flexible, non-duplicative, and structured to meet the skill needs of students and employers, with each educational level carefully articulated to the next;
  - Align curricula with rigorous college and career readiness standards for secondary students and with the competencies and credentials required by industry employers for occupations in demand;
  - Have multiple on- and off-ramps that align to stackable credentials and jobs, so students can enter and reenter into training and exit into jobs, according to their skills and credential attainment;
  - Provide opportunities for acceleration;
  - Be contextualized and use hands-on curricula and instructional strategies that impart work-readiness and occupational competencies;
  - Offer work-based learning opportunities; and
  - Provide academic and career counseling and wraparound supports to encourage persistence and completion.

### Recommended Actions:

Developing aligned Career Pathways systems often requires significant changes to the culture, organization, and delivery of education and training programs. Following are some actions that CTE systems—working with partners—can take to design and implement Career Pathways that enable students to attain the education, skills, and credentials necessary for high-demand jobs and careers. In all of these examples, CTE experts’ input will be essential to Career Pathways system development efforts:

1. Ensure that curricula are aligned with State Standards for academics and career and technical education; the Employability Skills Framework; recognized work readiness skills; and employer-validated occupational skills and credentials to prepare students and adult learners for college and careers.

2. Ensure that course content, credit, and credentials are sequential and non-duplicative, with one educational level articulated to the next, so students can progress along pathways, transition to new institutions where necessary, and attain industry-recognized postsecondary credentials and high-demand careers as quickly and seamlessly as possible.
3. Organize coursework to ease students’ participation and success in training through activities such as cohort-based training, non-semester-based scheduling, and alternative class times and locations (as appropriate), as well as through innovative uses of technology.

4. Modularize coursework in ways that align with stackable credentials and jobs, allowing students to move more easily between the labor market and further education and training, all while progressing toward higher-level credentials and degrees.

5. Identify and promote opportunities for acceleration. Offer and expand dual enrollment opportunities that allow secondary students to take postsecondary courses for college credit while still in high school. Offer co-enrollment opportunities that allow low-skilled adults and out-of-school youth to take postsecondary courses for college credit while still in Adult Education, English Language, or youth-serving programs. Acceleration strategies may also include condensed course scheduling, credit for prior learning, competency-based training, training boot camps, and other approaches that hasten the attainment of credentials and jobs in aligned Career Pathways systems.

6. Work with system partners to identify, develop, and conduct appropriate academic and skills assessments for students/participants to determine their placement or points of entry (on-ramps) along pathways, and to assess their skills attainment at multiple points along pathways. Where possible, industry-recognized assessments and credentials should be used and validated with employers for measuring occupational skills. Prior learning assessments and competency-based education and training are very attractive solutions for awarding credentials on an accelerated basis for individuals who already possess credentials and skills that can be converted to college credit and related credentials.

7. Utilize contextualized curriculum and instructional strategies that use work as the context for teaching academic and work-readiness competencies (e.g., team building, critical thinking, and communication).

8. Work with system partners—including those in workforce development, human services, and community-based organizations—to ensure comprehensive academic and career counseling as well as wrap-around social support services are provided for students at all levels, particularly at the beginning of a pathway and at points of transition. This may include the development of career maps that can help students visualize their most efficient pathways to credentials and high-demand jobs and careers.

State Examples

Prior to participating in the Advancing CTE in Career Pathways project, Kansas had already undertaken a great deal of work to establish high-quality CTE Programs of Study -- extending
from secondary through postsecondary CTE and Career Pathways at the postsecondary level. Kansas’s Program Alignment work at the postsecondary level established Career Pathways with stackable credentials in key occupations across the state’s community and technical colleges. Kansas’s Accelerating Opportunity-Kansas (AO-K) initiative integrates adult and postsecondary education programs to implement accelerated pathways to industry-recognized postsecondary credentials for low-skilled adults. The EXCEL in CTE and GED Accelerator initiatives encourage students to begin earning college credit and work toward industry-recognized credentials while still in high school, adult education, and Temporary Assistance for Needy Families (TANF) programs, respectively.

EXCEL in CTE “has provided a structural connection between secondary and postsecondary education. School districts and colleges are planning together to provide a seamless educational pathway for students. In some areas, joint program advisory committees are being developed to provide industry guidance to both secondary and postsecondary education.”

—Dr. Blake Flanders, President/CEO, KBOR

The Massachusetts Advanced Pathways Program (MAPP) in Hampden County provides opportunities for ninth grade students to begin studies in mechanical engineering technology while they are still in high school and supports professional development for teachers, including externships with regional manufacturers. Through partnerships between the West Springfield High School, Springfield Technical Community College, the REB, the Regional Advanced Manufacturing Partnership (RAMP), and funding from a Youth CareerConnect grant from the U.S. Department of Labor, the MAPP at WSHS is expected to serve 155 students over four years, propelling them to high school graduation with at least 12 college credits toward a postsecondary credential, and on to placement in postsecondary education, occupational training, or a job.

In Oregon, local partners, including Rogue Community College, developed a Basic Health Care Certificate (BHC) that stacks and lattices to 11 allied health certificates and degrees to meet health care workforce demand in southern Oregon. The certificate, which is now part of the college’s Allied Health Care program, can lead to Nursing Assistant, Community Health Worker, EMT, Health Care Informatics, Medical Assistant, Human Services, Clinical Lab Assistant, Nursing (RN), Dental Assisting, Fitness Technician, and Massage Therapy. The college developed the certificate program and pathway by consulting with local industry to determine labor market needs and with area high schools about existing CTE programs and dual credit opportunities. Rogue also collaborated internally to turn the process for developing the allied...
health certificate and pathway into a systemic approach for supporting multiple pathways in CTE and career pathways at the college.

Oregon has also developed more than 450 career pathway roadmaps, graphically displaying Career Pathways to industry-recognized credentials and degrees at the state’s 17 community colleges. Career Pathways in Oregon include entry and exit points and stackable credentials with labor market value. They also provide college credit and articulate one level to the next, over time leading to progressively higher-level credentials and degrees. The roadmaps are visual tools that illustrate the most efficient routes to credentials and provide labor market information on the specific occupations for which students prepare. Career Pathways roadmaps can be found at MyPathsCareers and on the websites of each of Oregon’s 17 community colleges. To help students learn about Career Pathways that are available to them while they are still in high school—including opportunities for dual enrollment—an increasing number of community colleges and school districts are developing aligned Career Pathways with corresponding roadmaps that begin in high school. A website with Career Pathways roadmaps that begins in secondary school is under development.

KBOR and KSDE are working to create an online portal in Kansas that will allow students to visualize and explore the academic and career pathways to high school diplomas, postsecondary education and training, postsecondary credentials (including certifications and degrees), and placement in a desired occupation. The portal will provide opportunities for students to explore the kinds of careers they want to pursue, and back map the credentials and coursework that are necessary for those careers. The site will help high school students develop individual plans of study that begin in the 9th grade and extend to and through postsecondary education and training that ends in postsecondary credentials – serving as a portable portfolio for documenting students’ accomplishments. It will also help students identify the most efficient (accelerated) pathways to credential/degree attainment in Kansas’s postsecondary institutions, including opportunities for dual enrollment where they can earn college credit while still in high school. Designed for use by students, parents, counselors, teachers, school administrators, state education and workforce officials, and employers – the portal will feature a user-friendly format, with pathways shown graphically and in ways that help students map their own paths. A similar online web tool is currently under development through Kansas’s Department of Commerce as part of the state’s work with U.S. DOL on the Workforce Data Quality Initiative (WDQI) – mapping postsecondary coursework and workforce opportunities. Discussions to align these two efforts are underway.

To encourage the development of Career Pathways systems across the state, Colorado released Creating Career Pathways in Colorado: A Step-by-Step Guide. The document outlines in detail the steps education and training providers can take to implement Career Pathways in partnership

A Guide for the Development of Aligned Career Pathways Systems
with industry, economic development, and workforce development stakeholders. It underscores the importance of using labor market data to target education and training towards in-demand occupations in targeted industries. It also provides strategies to help providers design and message career pathway options to students and jobseekers. Users can complete a shared action plan to begin closing identified gaps to improve service provision.

In April 2015, the NoCO Manufacturing Partnership was the first in the state to pilot the Step-by-Step Guide. NoCO held skills panels for their top ten critical occupations. The skills panels brought hiring authorities and top performing individuals in each occupation together to identify the knowledge, skills, and abilities (KSAs) needed for each of the ten critical occupations. To address the priority KSA gaps identified by regional employers, the Northern Colorado team is now working to increase the capacity of firms and training institutions to offer work-based experiences; strengthen the intake, facilities capacity, and connections of education and training providers; and make priority curriculum changes at regional educational institutions. Piloting the Step-by-Step Guide marked a critical benchmark in forming industry-driven Career Pathways in Colorado. To learn more about NoCO’s efforts on talent development, see http://www.nocomfg.com/talent.html.
Element Four

PURSUE NEEDED FUNDING, SUSTAINABILITY AND SCALE: CRITICAL FEATURES

- Pursuing public and private funding is critical to developing, implementing, sustaining, and scaling Career Pathways systems.

- In addition to using traditional funding (e.g., public funding for education, training, and workforce development), it is critical that stakeholders become adept at braiding public and private funding so that resources are leveraged and used more flexibly.

- Stakeholders should also look for alternative financing mechanisms to support effective Career Pathways strategies, initiatives and systems.

Recommended Actions: To achieve the level of funding necessary to develop and implement successful, aligned Career Pathways systems, CTE systems and partners can work together to:

1. Identify costs associated with developing; operating and scaling aligned Career Pathways systems.

2. Identify and seek out existing and new funding needed to build, sustain, and scale aligned Career Pathways systems (e.g., education; workforce development; human services; community and economic development; infrastructure funding; employer, labor, and philanthropic contributions; and alternative financing).

3. Identify areas of overlap among multiple funding sources and explore ways to braid siloed funding with all partners coming to the table with resources they can dedicate to developing and implementing aligned Career Pathways.

4. Conduct a coordinated outreach strategy to raise awareness of the need and build support for aligned Career Pathways systems, focusing on business, philanthropic funders, policymakers, and others that can help with private and public fundraising efforts.

5. Examine opportunities for alternative financing (e.g., bond financing; augmented Full-Time Equivalent (FTE) calculations in public education; weighted or tiered funding strategies where programs that cost more to implement but have higher returns on investment are funded at higher rates; consortia funding; employer-provided training; discretionary grants; and philanthropic funding).

6. Work to develop a sustainability plan for aligned Career Pathways systems.
State Examples

Beginning in 2008, Minnesota required its school districts and community/technical colleges to establish 26 Perkins Consortia for allocating Perkins CTE funding. The Consortia promote collaboratively planning, funding, and implementing CTE programs across the state. CTE leaders were asked to consider: CTE program improvement; anticipated programs of study; dual and concurrent enrollment opportunities; collaborative history and culture; high school to college matriculation patterns; geography; operating structures, with special attention paid to capitalizing on strengths of the existing basic grant and tech prep leadership; continuing collaborative activities that promote high school to college transition; and a decision-making model that would equitably and effectively address CTE programming. Consortia were required to include at least one eligible secondary member school district; at least one eligible postsecondary member college; and encouraged to consider other partners who may participate (though not directly receive Perkins funding) such as workforce centers, adult education programs, four-year universities, and non-public schools and institutions.vii

In 2011, the Kansas legislature enacted SB 143, creating a tiered funding model for postsecondary technical education. Under this model, four main components are used to compute the overall cost of any technical education course: instructor costs; instructional support costs; extraordinary costs; and institutional support costs. The cost model calculates a total per-credit hours cost rate for each technical education course. Once these calculations are made, funding is distributed accordingly to the state’s 26 two-year institutions. The new formula differentiates between tiered technical courses and non-tiered courses for non-technical, transfer, or general education credit hours.

As part of the Advancing CTE project, both Colorado and Hampden County, Massachusetts examined strategies for braiding public and private funding in support of their Career Pathways efforts. Beyond identifying funding sources, states and local communities involved in braided funding efforts must realize the importance of partnerships; identify funding and service priorities; clearly articulate system needs; and achieve efficiencies. Jobs for the Future developed a Braided Funding Toolkit for community colleges pursuing Career Pathways initiatives that may benefit states looking for ways to leverage resources for pathways efforts.
Element Five

IDENTIFY AND PURSUE NEEDED POLICY CHANGES: CRITICAL FEATURES

- Statutory, administrative, and institutional changes may be required to develop, implement, and scale aligned Career Pathways systems.

- All system partners should be involved in identifying and pursuing policies necessary for developing aligned Career Pathways systems.

**Recommended Actions:** Developing Career Pathways systems often requires significant changes to the organization and delivery of education and training programs, often necessitating corresponding changes to the policies governing these programs. To be successful in developing aligned Career Pathways systems that also include CTE POS, CTE system stakeholders and pathways partners should work as a team to:

1. Identify policy changes—whether statutory, administrative, institutional, or cultural—that will drive necessary systemic changes and eliminate barriers to developing and expanding aligned Career Pathways systems; and

2. Develop strategies for and participate in advocacy efforts in support of changes to federal, state, local, and institutional policies needed for developing and implementing aligned Career Pathways systems that include CTE POS.

**State Examples**

**Minnesota** was one of the first states to offer Postsecondary Enrollment Options (PSEO) to high school students, also known as dual enrollment. While PSEO courses were originally available only to students in their eleventh and twelfth grade years, recent legislation in Minnesota expanded eligibility for dual enrollment to students in the tenth grade if they are taking postsecondary CTE courses. PSEO courses are generally offered on the campus of postsecondary institutions in Minnesota, with some courses offered online. Students may take postsecondary courses on a full- or part-time basis. In Minnesota the tuition, fees, and required textbooks are provided at no cost to high school students, with postsecondary institutions paid by the Minnesota Department of Education (MDE) for PSEO participation.

In 2012, **Kansas** enacted Senate Bill 155 – also known as EXCEL in CTE – to enhance CTE in the state and better prepare high school students for college and careers. Beginning in the 2012-13 school year, Kansas high school students qualify for free college tuition if taking an approved course at a state technical and community colleges that leads to a high-demand certificate in Kansas’s economy. The initiative provides school districts with a $1,000 incentive for each high
school student who graduates from that district with an industry-recognized credential in a high-need occupation. Since the inception of Senate Bill 155, postsecondary career technical education in Kansas has experienced significant growth in the number of students participating in technical courses, the college credit hours generated, and credentials earned by students in high school.

Building on the success of EXCEL in CTE, in 2014 the Kansas legislature enacted House Bill 2506 designating an appropriation of $1.9 million for “Postsecondary education performance-based incentive funds”, known as the GED Accelerator. The GED Accelerator awards community and technical colleges with performance funding for students who concurrently earn a GED and an approved postsecondary credential. Colleges are eligible to receive up to $1,500—a payment of $500 for completing the GED and a payment of $1,000 for completing a high-demand, state-approved technical certificate—for students co-enrolled in adult basic skills and postsecondary technical pathway programs. Funding in this model also covers up to $170 of students’ costs for taking the GED test; more information is available in a 2015 report, A Brief Introduction to Accelerating Opportunity and Related Funding Opportunities in Kansas.

In Colorado, state legislation encouraged the development of both Career Pathways and industry sector initiatives. The 2015 legislative session passed and signed into law House Bill 15-1274, directing the CWDC to coordinate multiple agencies and industries in the design of industry-driven Career Pathways for critical occupations in the state’s growing industries. The first three Career Pathways resulting from this legislation will be in construction and related skilled trades, information technology, and healthcare. An earlier statute, House Bill 1165—which called for creating a Manufacturing Career Pathway in Colorado—aligned state education resources and planning to best support the current and future workforce needs of Colorado’s manufacturing sector. These actions were major steps in recognizing the impact that career pathways can have on the state’s education and workforce development systems and more broadly on its economy.
Element Six

IDENTIFY AND IMPLEMENT CROSS-SYSTEM DATA AND ACCOUNTABILITY SYSTEMS: CRITICAL FEATURES

- To measure the impact of aligned Career Pathways systems, system partners must find ways to collect data and measure performance across all participating programs, longitudinally.

- Cross-system performance metrics, including measures of participants’ progress and outcomes, are necessary for continuous system improvement, course correction, and to determine the success of the entire system.

- Cross-system data collection and performance measurement requires structures and strategies for gathering and sharing quantitative and qualitative data across agencies and partners.

Recommended Actions: To measure the degree to which a comprehensive Career Pathways system—and the individual occupational pathways that operate within the system—meet the education and employment needs of participants and the skill requirements of employers, CTE systems should be working with system partners to:

1. Identify the systems changes that must occur for aligned Career Pathways systems, and the performance metrics that will measure progress toward making those changes.

2. Identify outcomes for participants in aligned Career Pathways systems and performance indicators that will measure participants’ progress.

3. Identify outcomes for meeting the skill needs of employers in high-demand industries targeted in aligned Career Pathways systems, as well as the performance indicators that will measure progress on those outcomes.

4. Align information databases, identify gaps, and identify additional information that will be needed for shared data systems; consider how data will be stored, tracked, and shared.

5. Address problems in both collecting and sharing data, including the privacy concerns of students (e.g., FERPA impediments) and the timeliness of the data.

6. Collect and analyze program outcomes data, including pre- and post-test results for participants, employer business outcomes, and cost/benefit analyses.

7. Ensure data is used to drive decision-making.

8. Use disaggregated data to identify and address outcomes for different populations.
State Examples

As part of Colorado’s participation in the Advancing CTE in Career Pathways project, the state team identified the need for a common set of key performance indicators (KPIs) to measure the success of Career Pathways in the state. The Workforce Development Council and the state team worked with the National Center for Inquiry and Improvement to develop research questions; catalog existing data that could be used across agencies; and identify gaps in the data in response to the research questions. Building on this work, the data subcommittee of the Career Pathways team, working with a consultant to the sector partnership, developed draft KPIs for Career Pathways that are intentionally aligned with the sector partnership key performance indicators. The draft Career Pathways KPIs will continue to be refined and advanced by the data subcommittee of the State Career Pathways team.

Minnesota has a number of efforts underway to improve and better align the state’s education and workforce data, evaluation, and performance measurement systems. In addition to its Statewide Longitudinal Education Data System (SLEDS), Minnesota is also the recipient of a DOL Workforce Data Quality Initiative (WDQI) grant; the GWDC is working to establish a Net Impact—Return on Investment strategy for the state’s workforce training system; the CTE system is working to integrate secondary and postsecondary education data through the Integrated Postsecondary Education Data System (IPEDS); and the state is a partner in the Alliance for Quality Career Pathways (AQCP) efforts to establish a metrics framework for their Career Pathways efforts. As part of the Advancing CTE in Career Pathways project, partnering state agencies worked to identify data sets, analyses, dissemination, and partnership opportunities across these multiple efforts in support of Career Pathways efforts.

In 2013, Kansas also received a grant from DOL under the WDQI to: build linkages between statewide workforce and education data; expand its Statewide Longitudinal Data System (SLDS) to take into account workforce needs in the state; and strengthen partnerships between programs under authority of the Kansas Department of Commerce and KBOR, the primary recipients of the grant. The WDQI aims to track students from PK-12, workforce training, adult education, and postsecondary education programs into the workforce, looking at employment and wage data to assess program outcomes. In addition to collecting and using data internally by the participating Departments, Kansas is using this project to build a site for individuals in search of education, training and employment, as well as employers. Once developed, this site will be aligned with the online portal for high school students, earlier described (under Element Three), informing decisions about Career Pathways to industry-recognized credentials and high-demand careers.
“Accountability drives performance improvement. It is important that Kansas has the mechanism to reward high performing technical education programs and highlight promising practices.”
—Blake Flanders, President, KBOR

Prior to participating in the Advancing CTE project, Kansas established a performance-based funding model for its postsecondary institutions, where each institution’s receipt of new state funding would be contingent upon meeting goals outlined in individual Performance Agreements that are approved every three years and evaluated annually. Foresight 2020, Kansas’s 10-year strategic agenda for its higher education system, set long-range achievement goals that measure higher education attainment and the system’s alignment with the needs of the economy. KBOR also implemented a performance-based funding model for Adult Education in 2015, where 70 percent of state and federal Adult Education and Family Literacy funds will be distributed based on program performance. College readiness and enrollment/co-enrollment in postsecondary education are among the funded outcomes.

In addition to state-level efforts, federal policymakers are considering similar actions to align program performance measures and, in some cases, use the information to make outcome-based funding decisions. The Workforce Innovation and Opportunity Act (WIOA), enacted in 2014, already includes common performance measures for the multiple programs under its jurisdiction which gauge educational progress, credential attainment, employment, retention, and earnings for program completers, all in support of Career Pathways system development efforts. Attention on outcomes and system alignment is only expected to increase in future federal policy efforts.
VI. CONCLUSION

Many states have embraced Career Pathways Systems, particularly for meeting the education and training needs of low-skilled adults. At the same time, all states are developing Programs of Study within their CTE systems that are intended to expand opportunities for secondary CTE students to advance into postsecondary education and training that leads to industry-recognized credentials or degrees, and to good jobs.

While Career Pathways and Programs of Study share similar design features and intended goals, these efforts have been developing on parallel tracks in most states and local areas. While many of these independent efforts are of very high quality, these parallel efforts are not in the best interest of the students or employers who need cohesive and effective education and skills development efforts. However, this segmentation is beginning to diminish, as a number of states and localities are beginning to work together in support of aligned Career Pathways systems.

This Guide is intended to help state and local CTE systems think about how they can work to bridge these efforts—working with other system partners—to build on the best of CTE POS and Career Pathways initiatives through aligned Career Pathways systems that lead young people and adults alike to the attainment of industry-recognized postsecondary credentials and to family-supporting careers in high-demand industries and occupations.
ENDNOTES


iii Business Roundtable (BRT) STEM survey, 2015


