



# A Guide for the Development of Career Pathways in Transportation

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## About this Guide

This Guide outlines the steps that transportation industry stakeholders can take to develop or expand Career Pathways to focus on the skills, competencies, and credentials needed for high-demand jobs in the transportation industry and its subsectors. Specifically, this Guide:

- Provides a rationale for change, by describing the increasing need for skilled workers in the transportation industry and concerns over the prospect of a skilled worker shortage over the next 10 years if nothing is done;
- Identifies the potential of Career Pathways systems for addressing the skill needs of the current and future transportation industry workforce; and
- Describes a process for developing Career Pathways in transportation.

## Who Should Read this Guide?

This Guide is targeted to **transportation industry stakeholders**—including transportation agencies, state and local officials, employers, organized labor, education and training providers, community-based organizations (CBOs), workforce and economic development systems, and other individuals or organizations that would gain from developing and implementing a high quality education and workforce development system that effectively meets the skill needs of workers and employers in the transportation industry.

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# I. Purpose of this Guide

This guide will help transportation industry stakeholders build the education and training pipelines necessary to prepare students, jobseekers, and existing workers for careers in transportation and its modal subsectors. The guide builds on:

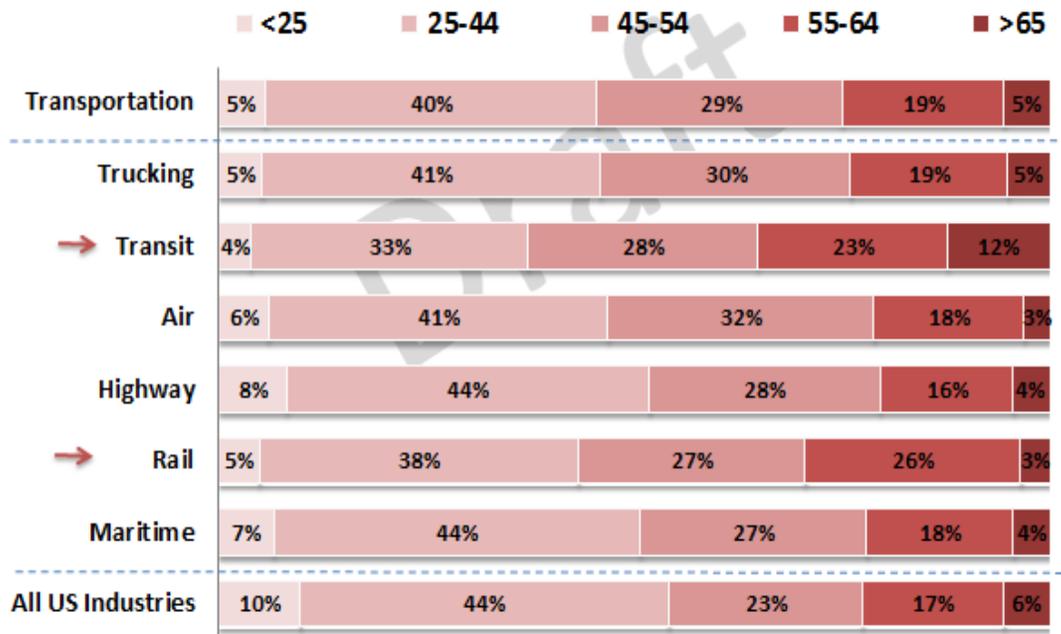
- State and local Career Pathways systems currently focused on other high-demand industries and occupations;
- The framework for developing state and local Career Pathways systems, jointly gathered and developed by the U.S. Departments of Education (ED), Labor (DOL), and Health and Human Services (HHS)<sup>i</sup>;
- Successful education and training programs in the transportation industry and its subsectors; and
- The Transportation, Distribution and Logistics Competency Model, developed by DOL and the Department of Transportation (DOT), along with system stakeholders.<sup>ii</sup>

## II. The Need

According to national transportation statistics, transportation-related industries in the U.S. employed a total of 12.3 million workers in 2011.<sup>iii</sup> However, the transportation industry faces major employment challenges over the next ten years as a result of job growth, retirements, and employee turnover. The transportation workforce skews older than the general workforce, and in many occupations workers retire early (Figure 1). Retirement will hit particularly hard in the rail and transit subsectors, but replacement needs are high in all subsectors including: Air Transportation, Highway Construction and Maintenance, Maritime (water transportation), Rail Transportation, Transit and Ground Passenger Transportation, and Trucking.

Figure 1. 2014 Transportation Workforce Age Distribution: Subsectors vs. All Industries

**55% of transportation workforce is 45+, 9% more than national average. Transit and Rail have the highest % of older workers.**



While demand for workers will vary by region, subsector, and occupation, these workforce changes will result in a large number of skilled and semiskilled job openings across the transportation sector over the next decade. To ensure that Americans have access to the best of these careers and that transportation industry employers can find the skilled workers they need to fill these openings, industry stakeholders must: 1) predict the number of available positions over

the next decade; 2) predict the competencies and credentials that will be needed to qualify employees for those positions; and 3) ensure that high quality education and training programs will instill these valued skills, particularly in regions where demand is high.

It is also critical that education and workforce development systems are made aware of the promise that careers in the transportation sector hold for students, jobseekers and workers—careers that offer family-supporting wages, benefits, and opportunities for advancement. Excellent examples of transportation systems that have made major inroads with regional education and training systems are included in Chapter V, such as [Denver’s Workforce Initiative Now](#) (WIN) and [Pennsylvania’s Keystone Transit Partnership](#) programs.

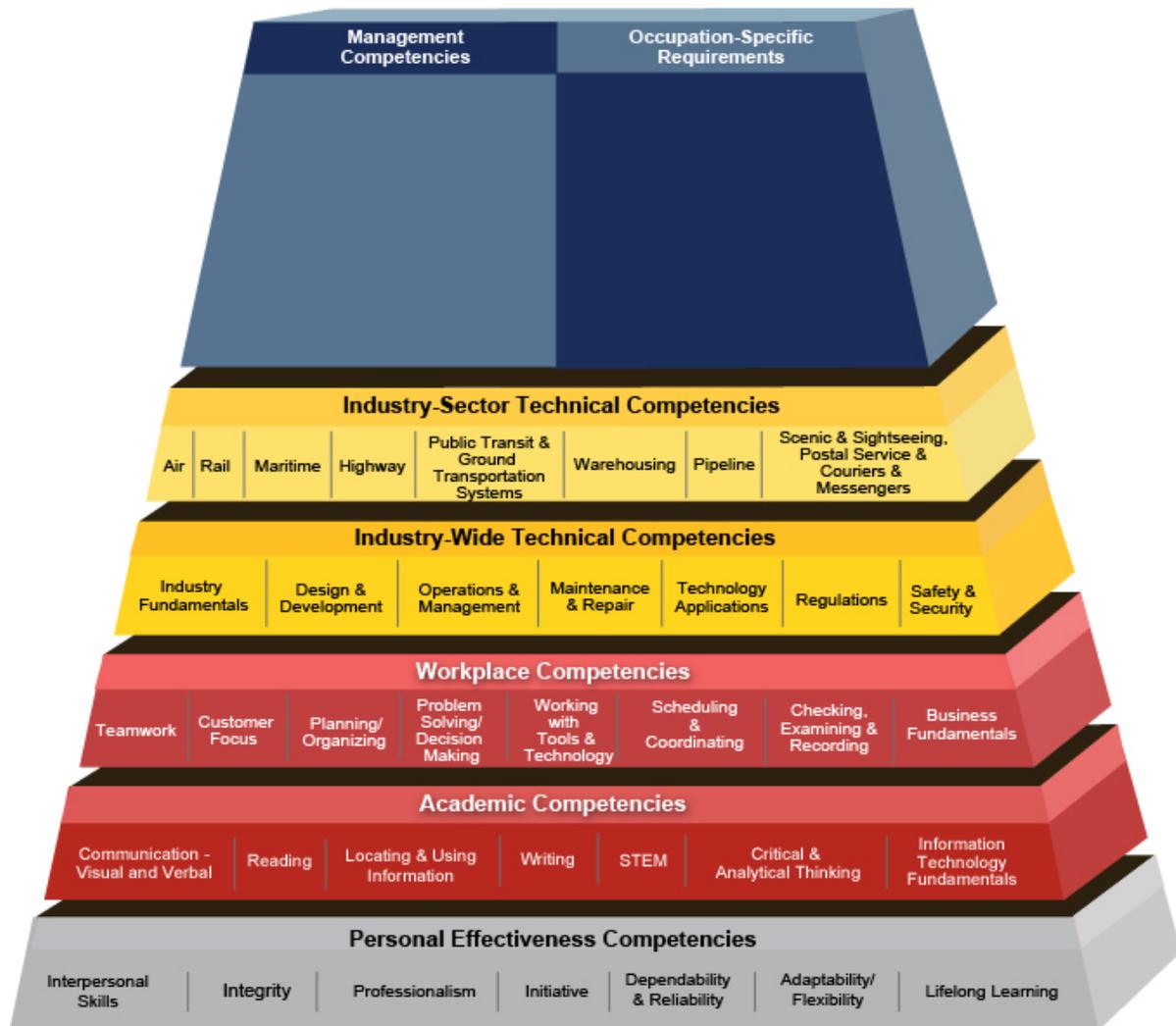
### III. Identification of Needed Competencies & Credentials

To identify the competencies and credentials needed for jobs in multiple high-demand industry sectors, DOL has sponsored the development of a competency model clearinghouse—working with industry and other stakeholders to identify and document the knowledge and skills required in a variety of high-growth and economically vital industries.<sup>iv</sup>

Competency models show the broad knowledge and skills needed for workforce success in a particular industry, as well as the more specific skills needed for individual occupations. They provide a framework for developing training programs, identifying and aligning stackable credentials, and forming the foundation for career ladders and lattices. Competency models also assist in developing Career Pathways within high-demand industry sectors by showing the progression of basic personal, academic, and workplace skills as well as credentials needed for careers within those industries.<sup>v</sup>

Developed by DOL and DOT, the [Competency Model for Transportation, Distribution and Logistics](#) (Figure 2) identifies competencies and skills that cut across transportation sectors and occupations as well as school- and work-based learning requirements for full competency in transportation occupations. With the interactive web version of the competency model, users can link directly to additional information about critical work functions, technical content areas, and connections to additional resources pertaining to occupations in the transportation industry. The fifth and sixth tiers of the Transportation Competency Model are being developed by individual transportation subsectors. The subsector models identify the competencies and credentials needed for entry into the unique occupations within each mode. Faced with large retirements in the near future and rapidly advancing technologies, the industry continues to pool resources to address gap areas.

Figure 2. Competency Model for Transportation, Distribution, and Logistics



## IV. Career Pathways—A Promising Strategy

**Career Pathways systems** have emerged in recent years as a very promising strategy for helping a wide range of students, jobseekers, and workers to access and complete the education, training, and credentials needed for high-demand jobs. In April 2012, the Departments of ED, DOL and HHS developed a [joint framework](#) for the development of Career Pathways systems, defining 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.”<sup>vi</sup>

But how do Career Pathways compare to the current assortment of education and training programs that are found in most communities across the country? And what actions are necessary to establish Career Pathways systems?

When ED, DOL, and HHS agreed upon a definition for Career Pathways, the agencies also identified Six Key Elements -- actions that states and local areas can take to develop and implement Career Pathways systems as shown in Figure 3.

**Figure 3. Career Pathways: Six Key Elements**



**For students,** Career Pathways systems provide guidance for selecting the most accelerated routes or pathways to credential and employment attainment. To the extent possible, Career Pathways should have multiple entry and exit points; be modularized in ways that align with stackable credentials and jobs; and carefully articulate each educational level to the next. Career Pathways should also offer flexible scheduling, acceleration strategies, contextualized learning, opportunities for work-based learning, and extensive support and counseling services.

**For employers,** effective Career Pathways systems ensure that: curricula and instruction meet the skill and credential requirements of their industries; workforce services address the skill and employment needs of specific projects; and recruitment is accomplished through a trusted network of education and training providers. Additional benefits for employers may include: streamlined access to skilled personnel and highly motivated entry-level employees; savings of time and money related to hiring, training, and retaining their workforce; help in navigating and connecting with hiring incentives such as Work Opportunity Tax Credits and On-the-Job Training salary reimbursements; and public recognition for community investments.

**For practitioners and policymakers,** effective Career Pathways systems provide a framework for organizing and formally aligning education, workforce, and support services and guiding a wide range of individuals through the education and training needed for industry-recognized credentials and family-sustaining careers. Career Pathways systems are strengthened by use of common data and performance measurement of educational progress, credential attainment, employment, earnings, and retention.

Career Pathways offer great promise for individuals who are low-skilled, underrepresented, or who have barriers to education and employment by helping them to pursue, progress through and complete the education and training needed for industry-recognized credentials and family-supporting employment. Career Pathways can also hold significant potential for transitioning members of the military, offering strategies for acceleration to credential attainment and credit for prior learning that allow veterans to enter into training at advanced points along pathways and into the workforce sooner.

Figure 4 on the following page, provides information about the many federally supported education and training programs that can be found in local communities across the country. This table displays the services, primary providers of those services, targeted populations, and contact information for many of these programs that offer technical education and training services geared to the needs of high demand industries and occupations. The degree to which transportation industry stakeholders are involved with these systems varies however. It is up to all system stakeholders, including those from the transportation industry, to work with system partners to ensure the development of comprehensive education and workforce systems that meet the skill needs of high demand industries and occupations.

**Figure 4. Major U.S. Education and Training Programs**

Program	Career and Technical Education (CTE) & STEM	Postsecondary CTE—Community Colleges	Workforce Development	Adult Education	Apprenticeship	Human Services/ Supplemental Nutrition Assistance Program (SNAP)	DOD/VA Programs
<b>Targeted Populations</b>	High School/ Postsecondary Students	Dual-Enrollment & Adult Community College Students	Low-Income Youth, Adults & Dislocated Workers	Low-Skilled Adults (without High School Diplomas/GED)	Primarily Working Adults	Low-Income Older Youth & Adults	Transitioning Military and Veterans
<b>Services Offered</b>	<ul style="list-style-type: none"> <li>Aligned secondary &amp; postsecondary technical education</li> <li>Integrated &amp; non-duplicative CTE &amp; academic courses</li> <li>Opportunities for students to acquire post-secondary credit</li> <li>Coursework leading to industry-recognized or postsecondary credentials</li> </ul>	<ul style="list-style-type: none"> <li>For-credit and non-credit education &amp; training</li> <li>Opportunities for students to acquire post-secondary credit</li> <li>Coursework leading to industry-recognized or postsecondary credentials</li> <li>Counseling services</li> </ul>	<p><b>For Jobseekers/ Workers:</b></p> <ul style="list-style-type: none"> <li>Skills assessments</li> <li>Labor Market Information</li> <li>Counseling</li> <li>Job search</li> <li>Training</li> <li>Work-based learning</li> <li>Mentoring</li> </ul> <p><b>For Employers:</b></p> <ul style="list-style-type: none"> <li>Recruiting</li> <li>Job fairs</li> <li>Employee screening</li> <li>Customized training</li> <li>On-the-Job Training</li> </ul>	<ul style="list-style-type: none"> <li>Basic skills/literacy education</li> <li>English language education</li> <li>Civics &amp; citizenship education</li> <li>GED preparation</li> </ul>	<ul style="list-style-type: none"> <li>Registered Apprenticeship pays wages to apprentices.</li> <li>Structured training combines on-the job training with related instruction</li> <li>Results in credentials &amp; journey worker skilled status</li> </ul>	<p><b>Allowable activities under Temporary Assistance for Needy Families (TANF):</b></p> <ul style="list-style-type: none"> <li>Work subsidies for eligible youth</li> <li>Education/training</li> <li>Supportive services</li> <li>Transportation for persons attending work or training</li> <li>Counseling and employment related services</li> </ul> <p><b>Under SNAP:</b></p> <ul style="list-style-type: none"> <li>Job search</li> <li>Education &amp; training work</li> <li>Experience</li> <li>Workfare &amp; unsubsidized employment</li> <li>Support services</li> </ul>	<p><b>Transition Assistance Program:</b></p> <ul style="list-style-type: none"> <li>Connects to civilian employment and training opportunities</li> <li>Provides needs assessment, counseling, and job search skills training</li> </ul> <p><b>Credentialing:</b></p> <ul style="list-style-type: none"> <li>Third-party certifying military training for civilian licenses</li> <li>Facilitates gap training to ensure troops meet civilian occupational competencies</li> </ul> <p><b>SkillBridge:</b></p> <ul style="list-style-type: none"> <li>A mobile application for posting and alerting users to employment and training opportunities</li> </ul>
<b>Providers / Where to Find Services</b>	Public High Schools; Community & Technical Colleges	Community & Technical Colleges	Workforce Boards/ America’s Job Centers	Range of Education & Community-Based Organizations	Labor-Management Partnerships	Human Services Offices	Numerous Private Sector and Veterans Service Organizations
<b>Links</b>	<a href="http://www.careertech.org">http://www.careertech.org</a>	<a href="http://www.utexas.edu/world/comcol/state/">http://www.utexas.edu/world/comcol/state/</a>	<a href="http://www.servicelocator.org">www.servicelocator.org</a>	<a href="http://www.literacydirectory.org">www.literacydirectory.org</a>	<a href="http://www.careeronestop.org/educationtraining/find/apprenticeshipofices.aspx">http://www.careeronestop.org/educationtraining/find/apprenticeshipofices.aspx</a>	<a href="http://dpaweb.hss.state.ak.us/files/pdfs/NATIONALDIRECTORY.pdf">http://dpaweb.hss.state.ak.us/files/pdfs/NATIONALDIRECTORY.pdf</a>	<a href="http://connect.dodskillbridge.com/">http://connect.dodskillbridge.com/</a>

## V. Building Career Pathways in Transportation

Transportation stakeholders—including employers and organized labor—should work with state and regional partners to clearly articulate the promise of transportation careers, identify the employment and skill needs of the transportation industry, and ensure that these skill and credential requirements are reflected in newly designed Career Pathways systems. Because many of the core competencies required for successful careers in transportation are widely shared across multiple industry sectors and subsectors (modes), transportation industry employers should likewise work closely with employers in other related industries (e.g., manufacturing, IT, energy, construction) as well as educators, to ensure that foundational career and technical education courses provide students, jobseekers, and workers with the underlying competencies necessary for a broad range of technical occupations.

For those modes of transportation where regional demand warrants the development of dedicated career pathways for specific occupations/careers, it is important that employers, labor, and other transportation industry stakeholders work closely with education and training providers to design programs, curricula, and instructional strategies that provide the specific competencies and credentials needed for high-demand transportation jobs and careers. This work makes the continued build out of Tiers 5 and higher on the Transportation Industry Competency Model—as shown in Appendix A for the Public Transportation Subsector—all the more important.

The following pages provide guidance for transportation industry stakeholders on:

- Becoming part of broader state and local Career Pathways system development efforts;
- Ensuring that education and training systems meet the skill needs of the transportation industry and its subsectors; and
- Establishing dedicated career pathways for high-demand transportation careers.

**Table 1. Recommended Partners, Actions, and Key Components of Career Pathways in the Transportation Industry**

<b>Recommended Partners, Actions, and Key Components</b>	<b>Career Pathways in the Transportation Industry</b>
<b>Key Partners</b>	<ul style="list-style-type: none"> <li>• Transportation Employers (including public and private employers and employer associations)</li> <li>• Organized Labor Working in the Transportation Industry</li> <li>• Federal, State and Local Government Transportation Oversight Agencies</li> <li>• K-12 Education Systems/STEM</li> <li>• Career and Technical Education</li> <li>• Adult Education Administering Agencies/Providers</li> <li>• Postsecondary and Technical Institutions/Community Colleges</li> <li>• Workforce Investment Boards &amp; One-Stop Career Centers</li> <li>• Social Services Agencies</li> <li>• Economic Development Agencies</li> <li>• Community-Based Organizations</li> <li>• Other partners with a stake in building Career Pathways in Transportation, such as organizations that work with transitioning military and veterans (e.g., Soldier for Life)</li> </ul>
<b>Key Actions for Developing Career Pathways in Transportation</b>  <i>(Organized by the Career Pathways: Six Key Elements)</i>	<ul style="list-style-type: none"> <li>• Agree on a common vision and goals for Transportation Career Pathways.</li> <li>• Engage transportation employers in identifying in-demand occupations, competencies, and credentials, as well as designing pathways.</li> <li>• Engage in system redesign to establish the continuum of aligned education, training, and support services to enable individuals to attain industry-recognized credentials, employment, and career progression in high-demand transportation occupations.</li> <li>• Pursue needed funding for sustaining and scaling transportation Career Pathways.</li> <li>• Identify and pursue policy changes needed for Career Pathways in transportation.</li> <li>• Identify and implement cross-system data and accountability systems that will inform and improve comprehensive Career Pathways in transportation.</li> </ul>

<b>Recommended Partners, Actions, and Key Components</b>	<b>Career Pathways in the Transportation Industry</b>
<p><b>Key Components of Career Pathways Systems</b></p> <p><i>(As identified by The Interagency Workgroup [ED, DOL, HHS] on Career Pathways)</i></p>	<ul style="list-style-type: none"> <li>• Alignment of systems: secondary, postsecondary, and workforce development.</li> <li>• Rigorous, sequential, connected, and efficient coursework that connects basic education and skills training and integrates education and training.</li> <li>• Multiple entry and exit points.</li> <li>• Comprehensive support services as well as academic and career counseling.</li> <li>• Financial supports and work-based learning opportunities.</li> <li>• Active engagement of business in targeted industry sectors aligned with the skill needs of industries important to the local, regional, and/or state economies.</li> <li>• Appropriate curriculum and instructional strategies that make work a central context for learning and work readiness skills.</li> <li>• Credit for prior learning and the adoption of other strategies that accelerate the educational and career advancement of the participant.</li> <li>• Organized services to meet the particular needs of adults, including accommodating work schedules with flexible and non-semester-based scheduling, alternative class times and locations, and the innovative use of technology.</li> <li>• A focus on secondary/postsecondary industry-recognized credentials, sector-specific employment, and advancement over time in education and employment.</li> <li>• Collaborative partnerships among workforce, education, human service agencies, business and other community stakeholders to manage the system.</li> </ul>

## VI. Six Key Elements: Recommendations for Establishing Career Pathways in Transportation

The following recommendations for establishing Career Pathways in transportation are organized around the Career Pathways: Six Key Elements—actions that transportation industry stakeholders can take to become involved in state and local Career Pathways system development efforts and to build dedicated pathways for high-demand transportation careers.

### Element One

#### BUILD CROSS-SYSTEM PARTNERSHIPS: CRITICAL FEATURES

- Career Pathways in transportation require the establishment of cross-system partnerships and the alignment of multiple programs, so that resulting education and training systems are capable of preparing a wide range of students, jobseekers, and workers for high demand, family-sustaining careers in transportation.
- Partnerships should include: transportation industry stakeholders (including employers and labor), education providers (K-12, Adult Education, Postsecondary, and CTE), regional workforce and economic development systems, CBOs, and others as appropriate.
- Partners should identify and agree upon a common vision, mission, and goals for Career Pathways systems and for dedicated pathways for high-demand transportation occupations.

**Recommended Actions:** To achieve the level of system alignment and partnerships needed to develop, strengthen and expand Career Pathways, transportation stakeholders should:

1. Identify the public and private partners in your region key to developing Career Pathways in transportation. (*See Appendix B for help finding key partners.*)
2. Establish a transportation-focused Career Pathways team made up of key partners.
3. Identify the skill needs of the industry, and—working with key partners—inventory existing education and training providers to identify skills gaps and determine providers' capacity to provide education and training for high-demand jobs in transportation.
4. Bring partners together in support of a shared vision, mission, and goals for developing or enhancing Career Pathways systems that meet the skill needs of the transportation industry and for developing specific transportation pathways where demand warrants.
5. Agree upon the roles, responsibilities, and value-add for each partner in developing and implementing a transportation-focused 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.

### **Cross-System Partnerships in Action**

Partnerships are critical to a growing number of successful transportation-focused education and training initiatives. From labor-management partnerships to collaboration with education and workforce system partners and community-based organizations (CBOs), partnerships are key to Career Pathways system development efforts.

[Pennsylvania's Keystone Transit Partnership](#) is a broad-based training program for future and current transit workers that started in Philadelphia in December 2001 with a grant from the Pennsylvania Secretary of Labor and Industry, but now includes 33 Pennsylvania public transit agencies and 23 unions. Current partners include: Southeastern PA Transportation Authority (SEPTA) and the TWU (Transport Workers Union) Local 234; Port Authority of Allegheny County (Pittsburgh) and the ATU (Amalgamated Transit Union) Local 85; the PA AFL-CIO; the PA Public Transportation Association and its agency members; Philadelphia Academies; the School District of Philadelphia; 1199C Training and Upgrading Fund; area community colleges; the PA Department of Labor and Industry; and the Philadelphia Workforce Investment Board. While originally focused on existing workers, the Keystone Transit Partnership has, through its wide-ranging collaboration, been very successful in expanding service delivery to youth and new hires. For instance, a SEPTA/TWU partnership has developed apprenticeships in bus, rail vehicle, elevator/escalator, and facilities maintenance; started a summer youth program; and developed an afterschool program.

The [Boston TranSTEM Academy](#) initiative and a 2014 Summer Jobs program are the result of a network of partnerships built up by the Massachusetts Bay Transportation Authority (MBTA). To initiate TranSTEM in Boston, the MBTA first partnered with RoxMAPP, a collaborative of Madison Park Vocational High School and Roxbury Community College. By tapping into this existing partnership, the MBTA was able to work with the Massachusetts Executive Office of Education, the City of Boston, and Boston Public Schools. From there, the MBTA expanded the network to include local stakeholders such as: The Boston Foundation and The Barr Foundation, both philanthropic organizations; YouthBuild Boston, with its particular emphasis on out-of-school youth; the Boston Private Industry Council, with its extensive network of school-based counselors connecting young people to the workforce; Cardozo TransTech Academy, a similar transportation-based high school in Washington, D.C.; and the University of Massachusetts Boston. The Massachusetts AFL-CIO has also actively supported this initiative.

With funding from the Federal Transit Administration, the [Jersey City Employment and Training Program](#) (JCETP) **Ladders Grant** is focused on providing training for Commercial Driver's Licenses as well as a number of other construction-trades training opportunities for two important populations: traditionally disadvantaged minorities, women, and veterans; and individuals who were recently incarcerated. The program is offered through a partnership between the JCETP, local unions, support services and training providers.

Another program built upon a robust collaboration with education, training, community-based and employer partners is the [Texas Construction Career Academy](#), a skills training program focused on careers in the highway construction industry for individuals who are minorities, women, and/or economically disadvantaged. Program components include: (1) an intensive intake, assessment and orientation process designed to determine participants' readiness for careers in highway transportation; (2) a two- to three-week course offering education, industry certifications, and heavy highway training; and (3) onsite job matching with local highway construction employers. The 2015 Academy served 175 participants throughout the state of Texas, helping to secure employment for 65 percent of its graduates. The Academy is funded by the Federal Highway Administration, administered by the Texas Department of Transportation, with sessions in 2015 managed by the University of Texas Arlington, Prairie View A&M University, the Houston Area Urban League, and the Associated General Contractors of Texas, as well as other community-based organizations.

## Element Two

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

- Employer engagement is essential to developing and implementing Career Pathways in transportation.
- Employer involvement is critical to identifying: in-demand occupations; the competencies and credentials required for those occupations; and standards of proficiency for industry-recognized competencies and credentials.
- Employers must be actively engaged in the design of Career Pathways systems.

**Recommended Actions:** To ensure that Career Pathways systems meet the skill needs of high-demand transportation employers, transportation industry stakeholders should:

1. Work with state and regional Workforce Investment Boards, economic development partners, and employers to analyze and validate the most recent Labor Market Information available to determine the employment and skill demands for transportation industry occupations.
2. Engage employers in:
  - Identifying regional skills needs and gaps;
  - Determining the capacity of regional education/training providers;
  - Validating competencies and credentials needed for in-demand occupations;
  - Designing Career Pathways systems and individual pathways, including instructional strategies and technical curricula incorporating employability skills<sup>vii</sup>;
  - Adopting credentials in making hiring and other employment decisions;
  - Addressing barriers to employment success;
  - Identifying projected job openings; and
  - Customizing training for projected openings.
3. Convene industry partnerships in or across high-demand transportation industry subsectors, to carry out the above listed actions.

#### **What are Industry Partnerships?**

Partnerships of employers within an industry sector who come together with education, workforce and economic development, labor, and community organizations to focus on the workforce and other needs of that industry within a regional labor market.

## **Employer Engagement in Action**

Employer engagement is critical to developing and implementing Career Pathways systems that are relevant to the skill needs of high demand industries and occupations.

[Mountwest Community and Technical College](#), located in Huntington, WV, offers Transportation Technology A.A.S degree programs with concentrations in seven different areas: Aviation, Intelligent Transportation Systems, Intermodal Management, Maritime, Railway, Roadway, and Transit. MCTC has worked with industry partners—including CSX—to identify job categories in which training and on-the-job experience can be appropriately evaluated for academic credit, and the college offers academic credit for work experience and training on the job as part of its Aviation, Maritime, Railway, Roadway, and Transit specializations. Up to 27 credits can be awarded for work-based training, with the possibility of additional credits for workers with a CDL and/or documented learning through military service.

When the [Multi-Craft Core Curriculum \(MC3\) Pre-Apprenticeship Program](#) was established, the National Standing Committee on Apprenticeship and Training of North America's Building Trades Unions identified curricular areas in all national building and construction trades apprenticeships that are common to all crafts. Working collaboratively with instructional leaders from the various crafts' apprenticeship programs—which are training programs supported through joint labor-management partnerships in each trade—the Committee developed a 120-hour common core curriculum for young people and adults, for entry into apprenticeship programs. To maintain apprenticeship standards and linkages with local labor-management apprenticeship programs, MC3 is initiated under the authority of local Building Trades Councils, coordinating the work of community-based organizations, joint labor-management apprenticeship committees, schools, and colleges.

In 2015, the International Brotherhood of Teamsters joined with the U.S. Army and ABF Freight under the [Teamsters Military Assistance Program](#) and originated a pilot program leading to a Commercial Driver's License for active military, enabling soldiers to quickly obtain meaningful employment on returning to civilian life. Strong veteran representation in the Teamsters and ABF Freight, where nearly a quarter of employees have served in the military, created a high level of internal support for enhancing partnerships with the military. The six-week CDL training at a U.S. Army base integrates both classroom and experiential learning from an ABF Freight Instructor and provides gap training for military drivers with highly transferable skills but in need of additional competencies to operate a commercial vehicle, such as working with manual transmissions and air brakes. Upon earning a Class A license, troops are offered a driving position with ABF Freight.

Using funds from the Department of Labor's [Transit Green Jobs Partnership Training](#) project, the Intermountain Transit Partnership, New Jersey Transit's Partnership Committee, and the Central Ohio Transit Authority conducted a skills gap analysis as the first step in assessing and identifying the training needs of their workers. The tasks and responsibilities in the analysis were based on the new National Training Standards developed by transit experts from labor and management working together with the Transportation Learning Center. Based on the results, the employers at each site determined which trainings to plan and implement at their individual locations.

The Florida Department of Transportation, working with the Construction Estimating Institute, sponsors a number of training programs geared to the needs of highway construction industry employers. These training programs, offered through the [Construction Management Development Program](#), are designed to enhance the technical and management skills of small and disadvantaged contractors, with training offered on how to: become an FDOT contractor, focusing on issues such as bonding and bidding requirements; read plans and make estimates; construct and submit FDOT bids; carry out effective project planning and scheduling practices; and implement fundamental business operations (e.g., accounting, bonding, government record keeping). The training provider, the [Construction Estimating Institute \(CEI\)](#), is a leading provider of construction education for employers and professionals alike.

## Element Three

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

- Career Pathways systems in transportation can help all individuals along the skills continuum—youth and adults—successfully train for and attain industry-recognized credentials required for entry into and progress in high-demand transportation careers.
- Career Pathways 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.
- Career Pathways in transportation should align curricula with rigorous college and career readiness standards for secondary students and with the competencies and credentials required by employers for occupations in demand.
- Career Pathways in transportation should:
  - Have multiple on- and off-ramps that align to stackable credentials and jobs—so students/workers can enter into training and exit into jobs—according to skills and credential attainment.
  - Provide opportunities for acceleration (the most efficient routes to credentials).
  - Be contextualized and use hands-on curricula and instructional strategies that impart work-readiness and occupational competencies.
  - Offer work-based learning and mentoring programs, including apprenticeships in high-demand occupations.
  - Provide academic and career information and counseling, as well as supports to encourage persistence and completion.

**Recommended Actions:** To provide opportunities for a wide range of individuals to successfully attain the industry-recognized skills required for entry into and progress in high-demand transportation occupations, transportation industry stakeholders should:

1. Work with system partners to ensure education and training coursework is focused on competencies and credentials that meet the needs of in-demand transportation occupations. The [Transportation Industry Competency Model](#) (Figure 2) is a valuable tool for helping transportation stakeholders (including education providers) design education and training programs that provide necessary competencies and credentials.
2. Work with employers and education/training partners to 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 and attain industry-recognized credentials as quickly as possible.

3. Work with education partners to organize coursework in ways that make it easier for participants (especially out-of-school youth and adults) to participate and succeed in training through activities such as cohort-based training, non-semester-based scheduling, alternative class times and locations, and innovative uses of technology.
4. Work with system partners to 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.
5. Work with high schools, adult education programs, workforce systems, and postsecondary institutions to identify and promote opportunities for acceleration through: dual enrollment, where secondary students take postsecondary courses for college credit while still in high school; co-enrollment, where low-skilled adults and out-of-school youth co-enroll in postsecondary courses for credit while still in adult education, English language, or youth serving programs; and credit for prior learning, competency-based learning, and other strategies that hasten credential attainment.
6. Use technical skills assessments that measure skills attainment at multiple points along a pathway; where possible use industry-recognized assessments and credentials; and award postsecondary credit and/or industry-recognized credentials, including apprenticeship training credentials.
7. Use contextualized curriculum (teaching in the context of transportation work) and instructional strategies that teach team building, critical thinking, communication, and other employability skills.
8. Work with system partners—including those in workforce investment, human services, community-based organizations, DOD, the VA, and others—to ensure the provision of comprehensive academic and career counseling, as well as wrap-around supports for students at all levels, particularly at the beginning of a pathway and at points of transition.
9. Work with system partners to develop career maps that visualize the most efficient pathways to credentials and high-demand transportation careers.
10. Work with employers to arrange for work-based learning opportunities, including formal peer training and mentoring programs that augment knowledge transfer and the practical application of skills training.

## **Program Design in Action**

Changing the organization and delivery of education and training programs is essential to the success of Career Pathways systems. To the extent possible, education and training should be organized to accommodate the real life needs of program participants and geared to the skill requirements of high-demand employers. To take innovative education and training program designs in the transportation industry to scale, successful strategies must be fully understood both for their value and in how they can be replicated and expanded.

The [Aviation Career and Technical Education High School](#) in Long Island, NY opened its doors in 1925 as a trade school; aviation was introduced in the 1930s. The program now allows students to receive both FAA certificates and meet the State Regents requirements for graduation. In addition to the certifications and licenses the school was offering, Aviation High School introduced the nation's first hands-on Commercial Aircraft Technician's Internship Program in 1995. By 1999, the school opened a JFK International Airport Annex offering internships and a classroom for Fifth Year Honors students to complete their second license. JetBlue, Delta, JFK International Airport, and British Airways are just a few partners that the high school has developed a relationship with over the years, allowing for internships, employer engagement and a curriculum that focuses on preparing students with industry-recognized credentials. Many Aviation High School students elect to enter the workforce upon graduation, while others work toward college degrees.

The [Paul Hall Center for Maritime Training and Education](#) in Piney Point, Maryland has used a Registered Apprenticeship program, the largest of its kind for entry-level seafarers in the United States, to prepare over 3,000 U.S. mariners since 2003. Apprentices receive training for careers on all types of vessels, pay no tuition and receive room and board during their participation. Participants who complete the training and graduate in good standing from the program are guaranteed jobs as Merchant Marines. In addition to licenses and postsecondary credit, the program also offers a complete high school equivalency program (GED), adult basic education and study skills, and English as a second language. The Paul Hall Center is a degree-granting institution approved by the Maryland Higher Education Commission. Students may apply for college credit for many of the CTE courses that they take while still in school. In addition, the Center offers some of the general education courses required for an Associate's degree. The school currently offers an Associate of Applied Science degree and certificate programs in nautical science technology and marine engineering technology.

The [TransSTEM Academy](#) in Washington, DC offers four pathways programs beginning in high school in: Aviation and Aeronautics; Electro-Mechanical Technology Training (EMTTP); Pre-Engineering; and Computer Science. In Aviation and Aeronautics, students study aviation

maintenance and processes, refurbish aircrafts through the Summer Aviation Institute, and learn the basics of flight through simulators and actual flight time. EMTTP students study electricity, electronics, and electro-mechanics, and design and construct electric powered go-carts and balancing robots. EMTTP students can also receive industry certification through the International Society of Certified Electronics Technicians in: Direct Current; Alternating Current; Semiconductors; and Digital. Pre-engineering students participate in classroom and hands-on STEM courses using Project Lead the Way curriculum, with concentrations in civil or aerospace engineering, digital electronics, computer science, and software engineering.

The [Transportation Learning Center \(TLC\)](#) is working with the **Signals Training Consortium** to complete a full suite of signals technician courseware for use in classroom and on-the-job training. As a new component of the 2015 Signaling Career Pathways project, a Veterans Task Force is developing a Military-Public Transportation Skills Crosswalk that will establish linkages between public transportation agencies and veterans, assisting with recruitment. In another project, **TLC** is working to address the full life cycle training needs of transit agencies and their frontline employees in **Integrating Career Pathways in Public Transportation: Rail Car Maintenance and Beyond**. This project integrates pre-employment education and training for incoming transportation workers, including a standards-based Transit Core Competencies Curriculum to train and prepare target populations (youth, minorities, women, low-income, rural, tribal, and other underserved populations) for entry into public transportation careers, and training for new employees.

The [Constructors Association of Western Pennsylvania Virtual Pre-Apprenticeship Program](#), a free online course, allows students and jobseekers to interact with each phase of a virtual highway construction project and learn about the skills needed to be a Carpenter, Cement Mason, Laborer, Operating Engineer, Pile Driver, and Teamster. The program includes videos, images and assessment questions. After completing the pre-apprenticeship program, which takes about 1.5 hours, participants can apply for one of several apprenticeship programs in highway construction located in western Pennsylvania.

The [National College Credit Recommendation Service](#) and the [American Council on Education](#) are national organizations that assess a range of training programs delivered by non-college based entities, such as employers and unions, and determine their ability to award college-level academic credit. After a full review or assessment that results in a finding of college-level credit, students can apply approved credits to a range of colleges and universities.

## Element Four

### PURSUE NEEDED FUNDING, SUSTAINABILITY AND SCALE: CRITICAL FEATURES

- The pursuit of public and private funding is critical to developing, implementing, scaling, and sustaining Career Pathways in transportation.
- In addition to using traditional funding (e.g., public funding for education, training, and workforce development), stakeholders should look for ways to access additional training resources (e.g., training programs and resources in transportation, community development, the Veterans Administration, infrastructure, employer and labor union contributions) and braid public and private funding so that existing resources can be leveraged and used more flexibly.
- Stakeholders should also look for alternative financing resources and mechanisms in support of effective Career Pathways strategies, initiatives, and systems.

**Recommended Actions:** To achieve the level of funding necessary to develop and implement successful Career Pathways in transportation. Stakeholders should work with partners to:

1. Identify costs associated with developing, operating, and scaling Career Pathways systems and individual pathways for high-demand transportation careers.
2. Identify and seek out funding sources needed for building Career Pathways in transportation (e.g., education, workforce development, human services, transportation, community and economic development, infrastructure funding, employer, labor, philanthropic contributions, and alternative financing).
3. Identify areas of overlap between multiple funding sources and explore ways to braid siloed funding—leveraging resources and resulting in efficiencies.
4. Conduct a coordinated outreach strategy to build support for Career Pathways systems that meet the skill needs of the transportation industry, focusing on business, philanthropy, 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 higher funding for technical programs that cost more to implement but that have higher returns on investment, employer-provided training, pursuit of discretionary grants, and philanthropic funding).
6. Work with partners to develop a sustainability plan and set goals for scaling Career Pathways in transportation.

## **Pursuit of Funding in Action**

Programs must strategize how best to combine traditional funding sources with additional resources to ensure funding, sustainability, and scale for career pathways.

In March 2013, Governor Steve Beshear announced the establishment of Kentucky's **Bridges to Opportunities (B2O)** program—an innovative training program designed to fill a need for women and minority workers in building Ohio River Bridges over the next several years. To initiate the training program, policy leaders in Kentucky, including the Kentucky Transportation Cabinet (KYTC), used \$19 million of Federal Highway funds received for the state's Ohio River Bridges Project. B2O is being implemented as the result of a high level partnership among state and local government agencies as well as public and private sector stakeholders. Training under the B2O program includes: basic skills and work readiness coursework, such as interviewing skills and safety rules/regulations; apprenticeships and work-skill programs in partnership with local unions; and an educational career track for obtaining a degree in a related field, funding up to two years of education toward a certificate or associate's degree. Once renovations are complete, B2O will be headquartered at the historic Louisville Trolley Barn that also houses the Kentucky African-American Heritage Center. The B2O initiative is a partnership of the Kentucky Transportation Cabinet, the Kentucky Education and Workforce Development Cabinet, Kentucky State University, Louisville-Jefferson County Metro Government, Jefferson Community and Technical College, and the Federal Highway Administration. At the program level it relies on a volunteer board of community leaders to help recruit and encourage participation in the program. The Louisville Urban League, University of Louisville, and Kentuckiana Works are among the organizations providing support and guidance for the program, with training offered by Kentucky State University, Jefferson Community and Technical College, local labor unions, and other postsecondary training institutions.

Denver's [Workforce Initiative Now](#) is also an example of a program that has leveraged a variety of resources to fund its work, especially from private and public sources—supported by RTD Internal Funds, Fluor Corporation donations, the John Laing Foundation, and the Federal Transit Administration grant. Their management team asserts that workforce and community development initiatives can be integrated successfully for the benefit of local residents, development project owners, and private or federal investors.

## Element Five

### IDENTIFY AND PURSUE NEEDED POLICY CHANGES: CRITICAL FEATURES

- Successfully developing, implementing, and scaling Career Pathways systems that focus on transportation may require federal, state, and local statutory, administrative, and institutional policy as well as cultural changes that support systems change.
- Transportation stakeholders should be involved with the full range of education, workforce, and other system partners (including employers and unions) in identifying and pursuing policies that are necessary for developing Career Pathways systems and individual transportation pathways.

**Recommended Actions:** To develop Career Pathways systems that are responsive to the skill needs of transportation employers and to establish individual pathways that prepare students, jobseekers, and workers for high-demand transportation careers, it is important that stakeholders:

1. Work with system partners to identify policy changes that are necessary—whether statutory, administrative, institutional, or even cultural—to eliminate barriers and drive the development and expansion of Career Pathways systems that meet the skill needs of the transportation industry.
2. Work as a team to pursue necessary changes in federal, state, local, and institutional policies to promote the development and implementation of Career Pathways systems that will result in a skilled workforce for the transportation sector.
3. Work with transportation industry stakeholders to identify transportation and infrastructure programs and funding (e.g., Federal Highway Administration On-the-Job Support Services) that can be used for workforce development efforts in your states and regions—and encourage such use.

## **Pursuit of Policy Changes in Action**

By working toward policy changes that catalyze developing Career Pathways systems, system partners may find ways to better coordinate resources, expertise and time. Programs that have had success in this particular area often start marginally and then find momentum as they accomplish change.

**UPS** has worked closely with the U.S. DOL's Registered Apprenticeship (RA) program in recent years to ensure that its own education and training programs meet the rigorous requirements for Registered Apprenticeship and to provide advice and recommendations to the Secretary of Labor on issues pertaining to apprenticeship. UPS has committed to hire 50,000 veterans by 2018 and plans to send many of these workers through the RA program in occupations ranging from driving and package delivery to operations and automotive repair. UPS is also seeking approval from the Department of Veterans Affairs (VA) for G.I. Bill certification of its RA program so eligible veterans can receive compensation while in training, making UPS's positions more desirable to veterans, assisting with their transitions, and helping with retention.

For over a decade, **Los Angeles** has been a leader in establishing **Community Benefits Agreements (CBAs)**, legally enforceable contracts negotiated between public and/or private project developers and members of the community interested in and affected by the project. Benefits negotiated on behalf of the community can range from employment and workforce initiatives such as targeted workforce hiring from surrounding communities to provisions that address a variety of critical community concerns such as environmental impacts and affordable housing benefits and protections. In exchange for these benefits, community groups agree to support LA Metro projects before government entities become involved in various stages of the project, including initial approval and permitting.

CBAs often overlap with employment-related agreements, such as **Project Labor Agreements (PLAs)**. PLAs are negotiated between project developers and labor organizations representing tradesmen working on a project and set out specific requirements for access to joint-labor management apprenticeships, as reflected in the [LA Metro-Building Trades Council PLA](#). In 2012, the Los Angeles/Orange Counties Building and Construction Trades Council and the Los Angeles County Metropolitan Transportation Authority (Metro) Board of Directors unanimously approved a PLA relating to work on Metro's transit construction projects, including training for and access to good jobs for targeted groups of workers – reflecting community stakeholders' desire to address poverty, unemployment and underemployment, particularly in disadvantaged communities as part of a broad coalition of the city, community and religious organizations. The PLA includes a Construction Careers Policy to support employment and training of workers from Los Angeles and Orange Counties with a commitment to diversity.

## Element Six

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

- To measure the impact of Career Pathways systems change and of individual occupational pathways, system partners must find ways to collect data and measure performance across all participating programs.
- Cross-system performance metrics—including measures of participants' progress and outcomes—are necessary for continuous system improvement, course correction, and to determine success of the entire system.
- Cross-system data collection and performance measurements require the development of structures and strategies for gathering and sharing quantitative and qualitative data across agencies and partners.

**Recommended Actions:** To measure the degree to which the dedicated pathways established for transportation careers meet the skill needs of the industry's workers and employers, transportation stakeholders must work with state and local partners to:

1. Identify performance indicators, including participant outcomes, which convey the effectiveness of Career Pathways systems to the industry and its subsectors.
2. Align information databases and consider how data will be stored, tracked, and shared.
3. Address problems with collecting and sharing data, including privacy concerns of students and the timeliness of the data.
4. Collect and analyze program outcomes data including pre- and post-test results, participant comparisons, employer business outcomes, and cost-benefits analyses.
5. Set long- and short-term goals and measure progress against them.
6. Ensure data is used to drive decision-making.
7. Use disaggregated data to identify and address outcomes for different populations.

## **Cross-System Data and Accountability Systems in Action**

By collecting and analyzing data, and developing cross-system performance measurement systems, program administrators and policymakers are able to identify the degree to which their programs are impacting the populations and employers they serve.

The [Keystone Transit Partnership's](#) Labor/Management Committee worked with Educational Data Systems, Inc. to identify industry skill needs; measure and analyze skills gaps; identify training priorities; and reorganize, benchmark, and re-evaluate training programs. Further analysis conducted by the Transportation Learning Center found that the Partnership's standards-based partnership training for transit frontline workers made it possible for participants to achieve collective annualized wage increases of \$468,000. The training program also helped participating transit agencies (employers) achieve positive outcomes including: reducing unnecessary part replacements; improving labor efficiencies; improving equipment reliability; and achieving longer mean distances between failures of vehicles. These improvements resulted in maintenance and fleet procurement cost savings of between \$10 million and \$22 million at just one agency. After 18 months, it was estimated that every dollar invested in standards-driven partnership training generated at least \$5 million in transit agency savings. In addition to jobseeker and worker outcomes, these are the kinds of employer-related outcomes that can be collected and reported to not only improve, but also to build support for effective education and training programs in the transportation industry.

Denver [Workforce Initiative Now](#) collects and reports on data for support agencies and stakeholder organizations through a coordinated program that links workforce development with economic development for the benefit of residents, employers, and communities. Program and performance data are critical to benchmarking performance and to the continuous improvement and effectiveness of education and training systems. Program and performance information reported on by Denver WIN includes data on: its network of 53 local programs that offer pre-employment and career development training for community residents; the number of courses completed on pre or post-employment during the grant period; the average starting wage of project-affiliated positions (\$16.25 per hour and \$32,500 annually); the overall program placement rate (83 percent); the 90-day retention rate (93 percent); and the position advancement rate (15 percent) of workers.

## VII. Conclusion

The transportation industry is expected to face serious skilled worker shortages over the next ten years unless more is done to attract and prepare a wide range of workers for the family-supporting skilled and semiskilled jobs that will become available. While many promising initiatives are underway, a number of which have been mentioned in this paper, concerns persist that these initiatives alone cannot keep up with the future demand for workers that will result from job growth, retirements, and employee turnover in the industry.

Career Pathways offer an important strategy for expanding the pool of skilled workers. It is critical however that transportation industry stakeholders work with education and workforce development system leaders to: clearly articulate the promise of transportation careers; identify the employment and skill needs of the transportation industry; and ensure that these skill and credential requirements are reflected in newly designed Career Pathways systems. For those modes of transportation where regional demand warrants the development of dedicated career pathways for specific occupations and careers, it is important that employers, labor, and other stakeholders work closely with education and training providers to design pathways, curricula, and instructional strategies that fully meet the skill needs for high-demand transportation jobs and careers.

Fully developed Career Pathways systems allow jobseekers to enter and exit the education and training continuum at multiple points along their pathways to credentials and careers. A jobseeker may earn a credential for an entry-level job, then continue in training or reenter at a later date to earn further occupational credentials. This allows workers to climb career ladders in their particular occupations or move across lattices into new occupations or even other modes of transportation. Career Pathways systems also help employers to engage with education and training providers, to identify the attitudes, competencies, and credentials workers need for entry into and progress in transportation industry careers.

In summary, the transportation industry's active participation in developing and implementing Career Pathways systems will:

- Increase the pipeline of transportation workers;
- Increase the transportation industry's presence in CTE and other education, training, and workforce development programs;
- Expand opportunities for young people and adults to participate in a wide range of education, training and work-based learning activities which lead to careers in the transportation workforce; and

- Enhance the skills and competitiveness of the transportation workforce and its employers.

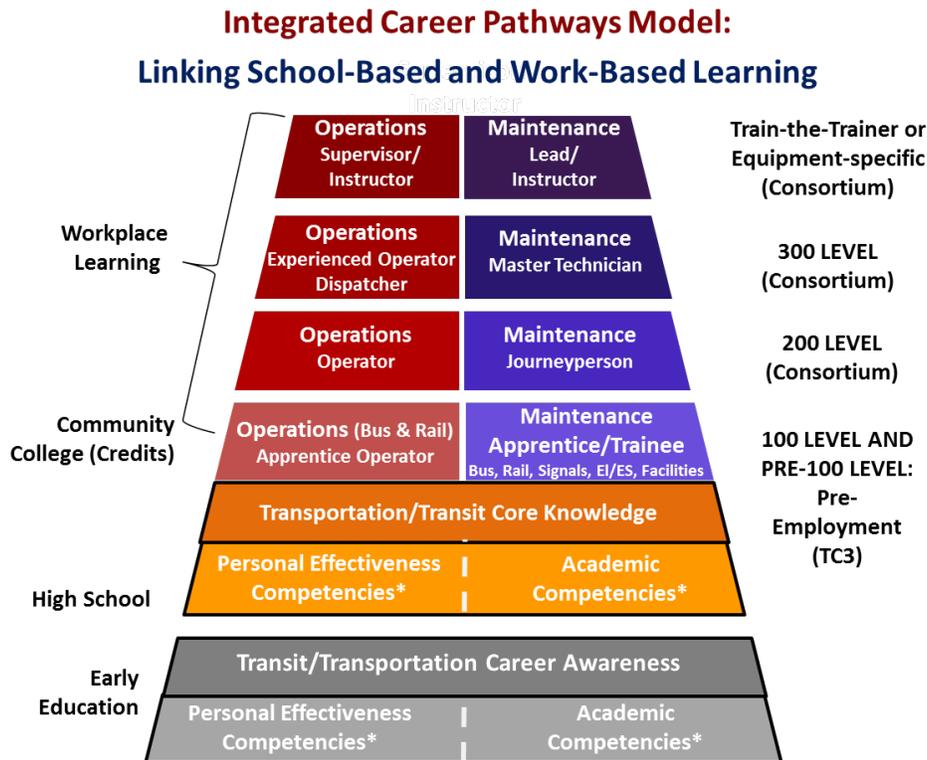
By becoming more involved in these broader education and workforce development efforts within states and regions, transportation industry stakeholders will ensure that:

- Students develop the foundation and work readiness skills needed by the industry;
- The occupational competencies and coursework shared across modes of transportation and comparable industries meet the needs of transportation employers;
- Education and workforce partners are aware of the importance of including pathways in high-demand transportation careers as part of broader Career Pathways systems; and
- Dedicated Career Pathways in transportation, and the necessary corresponding competencies and credentials, will be made available in regions where targeted occupations are in demand.

# Appendix A. Integrated Career Pathways Model in Public Transportation

The Integrated Career Pathways Model in Public Transportation below exemplifies a custom model for Public Transportation, a key transportation subsector. It is built upon DOL’s Transportation, Distribution, and Logistics Competency Model discussed in the body of the paper. This model illustrates a comprehensive Career Pathway that moves from developing basic core competencies up through the top levels of technical expertise, training, and education connected to frontline work in public transportation. The pyramid itself notes the increasing levels of competencies required as workers move from career preparation up through the highest levels of frontline technical careers. The levels on the right side of the figure note corresponding levels of training materials, while the categories on the left link the increasingly more complex and detailed competencies with the kinds of education and training providers through which workers can develop them.

Figure 5. Integrated Career Pathways Model in Public Transportation



Source: TLC graphic building on US DOL Competency Model on Transportation, Distribution and Logistics.  
 \* See DOL Competency Model for details: <http://www.careeronestop.org/competencymodel/competency-models/transportation.aspx>

## **Appendix B. Finding Education and Training Resources in Your Community**

The education, training, workforce, and economic development programs that align to establish a Career Pathways system in your region consist of a variety of service delivery programs and institutions. These providers are funded with federal, state, and local public resources, as well as with private funding sources and may include:

- Career and Technical Education Programs of Study that begin in high school and extend to and through postsecondary institutions;
- Adult education programs for individuals with limited basic or English language skills;
- Community and technical colleges as well as four-year postsecondary institutions;
- Workforce development organizations focused on helping out-of-school youth and adults find the education and skills training needed for family-supporting employment;
- Economic development systems focused on generating employment and economic growth in regions; and
- Services provided by community-based organizations focused on issues including equity, supportive services, and programing focused on targeted populations.

If you do not know where to locate the programs in your area, Table 2 can assist you. Each resource has a corresponding URL(s), so you can find out more about the programs and contact providers in your region. These URLs provide initial direction for finding education and training resources, but for help in finding them all, you will want to turn to your local Workforce Investment Board, One-Stop Career Center, business or trade association, chamber of commerce, or other relevant points of reference in your area.

**Table 2. Resources for Education & Training**

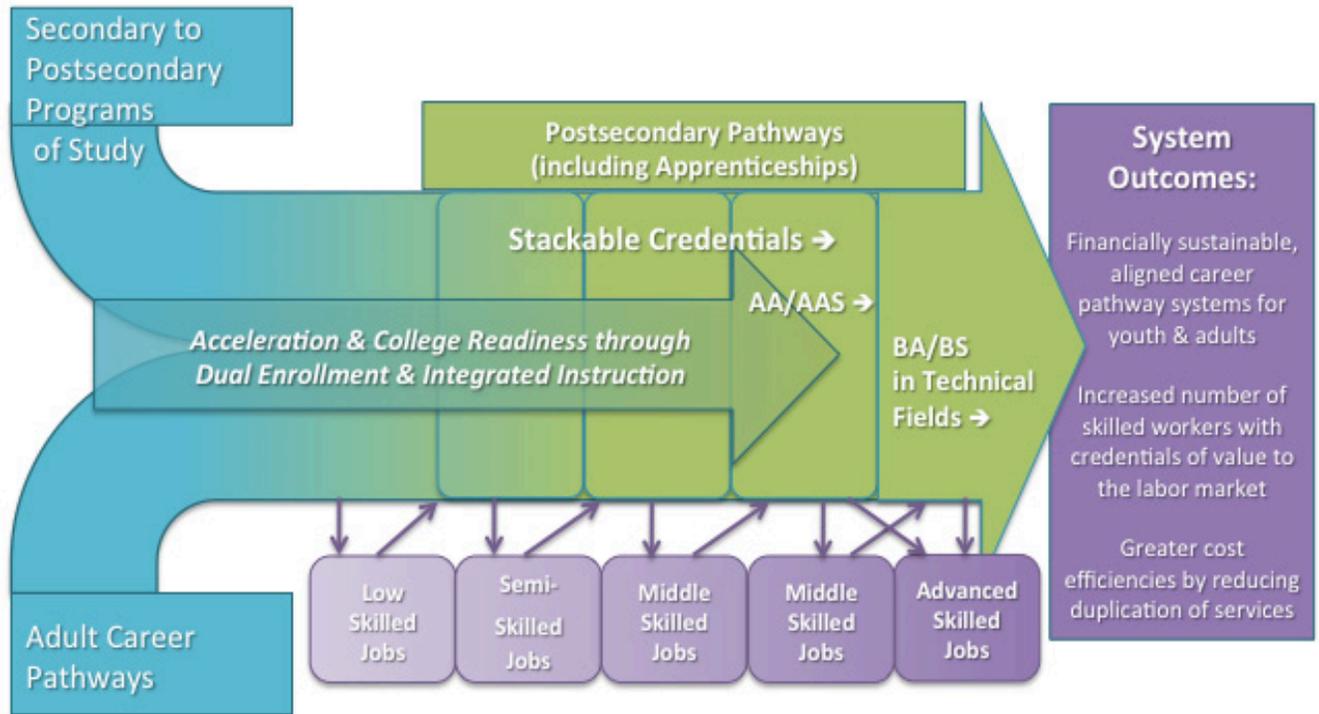
<b>Community/Tech Colleges</b>	<a href="http://www.utexas.edu/world/comcol/state/">http://www.utexas.edu/world/comcol/state/</a>
<b>State Universities</b>	<a href="http://www.collegeview.com/collegesearch/collegelistbystate.html">www.collegeview.com/collegesearch/collegelistbystate.html</a>
<b>Workforce Investment Boards/One-Stop Career Centers</b>	<a href="http://www.servicelocator.org">www.servicelocator.org</a>
<b>Economic Development Agencies</b>	<a href="http://www.eda.gov/resources">www.eda.gov/resources</a>
<b>Manufacturing Extension Partnerships</b>	<a href="http://www.nist.gov/mep/">http://www.nist.gov/mep/</a>
<b>Adult Education &amp; Literacy Programs</b>	<a href="http://www.literacydirectory.org">www.literacydirectory.org</a> <a href="http://www2.ed.gov/about/offices/list/ovae/pi/AdultEd/index.html">http://www2.ed.gov/about/offices/list/ovae/pi/AdultEd/index.html</a>
<b>Community Based Organizations &amp; Faith Based</b>	<a href="http://locator.goodwill.org">http://locator.goodwill.org</a> <a href="http://www.salvationarmyusa.org">www.salvationarmyusa.org</a> <a href="http://www.ymca.net">www.ymca.net</a> <a href="http://nul.iamempowered.com/in-your-area/affiliate-map">http://nul.iamempowered.com/in-your-area/affiliate-map</a> <a href="http://www.iajvs.org/index.htm">www.iajvs.org/index.htm</a>
<b>Transportation</b>	<a href="https://fhwaapps.fhwa.dot.gov/foisp/staffnetStateDOT.do">https://fhwaapps.fhwa.dot.gov/foisp/staffnetStateDOT.do</a> Transit Virtual Career Network: <a href="https://www.vcn.org/transit/">https://www.vcn.org/transit/</a> Transit Training Network: <a href="http://www.transittraining.net">http://www.transittraining.net</a> National Transit Institute: <a href="http://www.ntionline.com/">http://www.ntionline.com/</a> Regional Surface Transportation Workforce Centers (TBD) Transportation Education, Training, and Workforce Development Programs and Resources: <a href="http://www.fhwa.dot.gov/transprocat/">http://www.fhwa.dot.gov/transprocat/</a> National Highway Institute: <a href="http://www.nhi.fhwa.dot.gov">http://www.nhi.fhwa.dot.gov</a> U.S. Merchant Marine Academy: <a href="http://www.usmma.edu/">http://www.usmma.edu/</a> Careers in Railroad (Report): <a href="http://www.uvm.edu/~transctr/workforcedev/Get%20Moving!%20-%20Careers%20in%20Rail.pdf">http://www.uvm.edu/~transctr/workforcedev/Get%20Moving!%20-%20Careers%20in%20Rail.pdf</a>
<b>K-12 Schools</b>	<a href="http://nces.ed.gov/ccd/schoolsearch/">http://nces.ed.gov/ccd/schoolsearch/</a>
<b>CTE POS</b>	<a href="http://cte.ed.gov/initiatives/programs-of-study">http://cte.ed.gov/initiatives/programs-of-study</a>
<b>TANF &amp; SNAP</b>	<a href="http://dpaweb.hss.state.ak.us/files/pdfs/NATIONALDIRECTORY.pdf">http://dpaweb.hss.state.ak.us/files/pdfs/NATIONALDIRECTORY.pdf</a>
<b>DOD &amp; VA</b>	<a href="http://www.militaryonesource.mil/transition">http://www.militaryonesource.mil/transition</a>

## **Appendix C. Graphic Depicting Career Pathways Systems—An Integrated Model<sup>viii</sup>**

The following graphic shows how Career Pathways systems can be built to serve a range of individuals—youth and adults—entering into pathways through on-ramps that correspond with their education and skills levels at the point of entry, and off-ramps to jobs that correspond with the skills and credentials attained. The graphic shows:

- How articulated pathways can make it far easier for youth and adults to advance through progressive levels of the education and training system as quickly as possible;
- How Career and Technical Education Programs of Study (beginning in high school) and adult-focused Career Pathways can align at the postsecondary level;
- How progressive modules of education and training can align with stackable credentials and with employment opportunities in high-demand industries and occupations;
- How on- and off-ramps (shown by the arrows leading onto and off of the pathway) can align with stackable credentials and jobs, allowing students and participants to move easily between the labor market and further education and training in order to advance in their careers and upgrade their value in the workplace; and
- How dual-enrollment (college courses while in high school) and co-enrollment (college courses while in Adult Basic Education) can accelerate credential attainment.

**Figure 6: How Career Pathways Can Be Built**



## **Appendix D. Glossary**

### **Career Pathways Systems**

“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.”<sup>ix</sup>

### **Career Ladders and Lattices**

Suggesting vertical and lateral movement between jobs in a career path.

### **Credential**

“A verification of qualification or competence issued to an individual by a third party with the relevant authority or jurisdiction to issue such credentials (such as an accredited educational institution, an industry-recognized association, or an occupational association or professional society)”<sup>x</sup>

### **Stackable Credentials**

A sequence of credentials that help individuals move vertically and laterally along career pathways to higher-paying jobs.

## Endnotes

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<sup>i</sup> Dann-Messier, Brenda, Jane Oates & George Sheldon. 2012. *Joint Commitment Letter From U.S. Departments of Education, Health and Human Services, and Labor*.

[http://cte.ed.gov/docs/RPOS\\_2012/Joint\\_Letter\\_Career\\_Pathways.pdf](http://cte.ed.gov/docs/RPOS_2012/Joint_Letter_Career_Pathways.pdf)

<sup>ii</sup> Competency Model Clearinghouse: Transportation, Distribution and Logistics Competency Model. 2014. <http://www.careeronestop.org/competencymodel/competency-models/transportation.aspx>

<sup>iii</sup> U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics. 2014. *Pocket Guide to Transportation 2014*. Table 5-7: Employment in Transportation-related Industries.

[http://www.rita.dot.gov/bts/bts/sites/rita.dot.gov.bts/files/publications/pocket\\_guide\\_to\\_transportation/2014/5\\_Economy/table5\\_7](http://www.rita.dot.gov/bts/bts/sites/rita.dot.gov.bts/files/publications/pocket_guide_to_transportation/2014/5_Economy/table5_7)

<sup>iv</sup> The Department of Defense is similarly piloting a program to help service members transition into the private sector by aligning military and civilian occupational competencies (including truck driving, medical, supply, automotive mechanics, aircraft mechanics, IT and manufacturing) and then connecting service members to gap training, awarding credentials when service members meet industry standards, and linking to employment opportunities. through a mobile application called DOD SkillBridge. <http://www.defense.gov/news/newsarticle.aspx?id=123070>

<sup>v</sup>U.S. Department of Labor. 2012. *Technical Assistance Guide for Developing and Using Competency Models—One Solution for The Workforce Development System*.

[http://www.careeronestop.org/competencymodel/Info\\_Documents/TAG.pdf](http://www.careeronestop.org/competencymodel/Info_Documents/TAG.pdf)

<sup>vi</sup> See: Dann-Messier et al. (2012).

<sup>vii</sup> PCRN National Initiatives: Employability Skills Framework. n.d.

<http://cte.ed.gov/initiatives/employability-skills-framework>

<sup>viii</sup> PCRN National Initiatives: Advancing CTE in State and Local Career Pathways. n.d

[http://cte.ed.gov/nationalinitiatives/advancing\\_cte.cfm](http://cte.ed.gov/nationalinitiatives/advancing_cte.cfm)

<sup>ix</sup> See: Dann-Messier et al. (2012).

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× U.S. Department of Labor. 2014. Credential Resource Guide.  
<http://wdr.doleta.gov/directives/attach/TEGL15-10a2.pdf>