

Regional Talent Pipelines:


Collaborating with Industry to Build Opportunities in Texas

December 2016



Federal Reserve
Bank of Dallas

CENTER *for* **PUBLIC POLICY PRIORITIES**



“It is critical for industry to actively engage in programs that promote workforce development. I applaud efforts by companies to partner with educational institutions, industry peers, regional workforce boards and chambers of commerce in order to foster these programs. These efforts will help create career pathways to middle- and highly-skilled jobs that pay attractive wages and help build our middle class. The engagement of business and community leaders in this effort is critical to our economic vitality, resilience and competitiveness.”

Robert S. Kaplan

President and Chief Executive Officer
Federal Reserve Bank of Dallas

“The jobs story in Texas has always been more complex than some folks claim. The shrinking middle class helps explain why strong job growth in Texas hasn’t led to equally strong reductions in poverty and inequality. Instead of hoping for miracles, we need to work together to enact smart public policies that make Texas the best state for hard-working people and their families.”

Ann Beeson

Executive Director, Center for Public Policy Priorities

Table of Contents

SECTION ONE

Labor Market Trends 5

The Shrinking Middle Class 6

SECTION TWO

Building Regional Pipelines in Texas: A Guiding Framework..... 8

Industry Clusters 9

Sector Partnerships 12

Career Pathway Development 15

Regional Talent Pipelines: Collaborating with Industry to Build Career Pathways 17

Building Regional Talent Pipelines to Opportunity Occupations 19

SECTION THREE

Workforce Development Activities in Texas: Survey Results 21

The Texas Workforce System: General Observations 22

The Texas Workforce System: Promising Practices 23

The Texas Workforce System: Opportunities for Improvement 27

SECTION FOUR

Case Studies of Promising Practices in Texas 31

Houston 31

West Central Texas 33

Dallas-Fort Worth 35

SECTION FIVE

The Path Forward: A State’s Role in Supporting Regional Efforts..... 38

The Vision: A World-Class Texas Pipeline 40

The Data: The Texas Talent Pipeline Report 41

The Blueprint: State Technical Support and Resources 43

Acknowledgments 46

Notes..... 47

Abstract



Over the past three decades, the share of middle-skill jobs has been shrinking in the U.S. economy. These are jobs that require workers to perform repetitive and procedural tasks, such as those performed by assembly line workers at a manufacturing company or typists at an accounting office. This form of job polarization has forced millions of American workers to make a choice: either get more education and workforce training to develop the skills and build the knowledge required for new middle- and high-skill occupations, settle for a lower-wage job in a low-skill service or manual labor occupation, or drop out of the labor force. Across the U.S., regional workforce development systems are responding to this pressing issue by building career pathways that create advancement opportunities for lower-skilled workers and help job seekers maximize their value in the changing labor market.

To assess how Texas communities are addressing this challenge, the Federal Reserve Bank of Dallas and Austin-based nonprofit Center for Public Policy Priorities reviewed national best practices to provide a guiding framework for analysis and then, in partnership with the Texas Association of Workforce Boards, surveyed the 28 regional workforce boards in Texas. The workforce boards were selected for the survey because their mission places them at the center of much of the activity in their regional workforce system. The purpose of the survey was to identify the most innovative and robust efforts to align workforce development activities across each region in the state, and all 28 workforce boards responded to the survey.

This report concludes with a set of recommendations on how some of Texas' state-level entities can help guide and support world-class career pathways to middle-skill, middle-wage jobs and beyond. The recommendations are intended as a resource to complement Governor Greg Abbott's Tri-Agency Workforce Initiative, led by the Commissioners of the Texas Education Agency, Texas Higher Education Coordinating Board and Texas Workforce Commission.

Authors

Elizabeth Sobel Blum, Federal Reserve Bank of Dallas

Garrett C. Groves, Center for Public Policy Priorities and scholar-in-residence of the Federal Reserve Bank of Dallas

Editor

Carol Dirks, Federal Reserve Bank of Dallas

Graphic Designers

Gene Autry, Federal Reserve Bank of Dallas

Emily Rogers, Federal Reserve Bank of Dallas

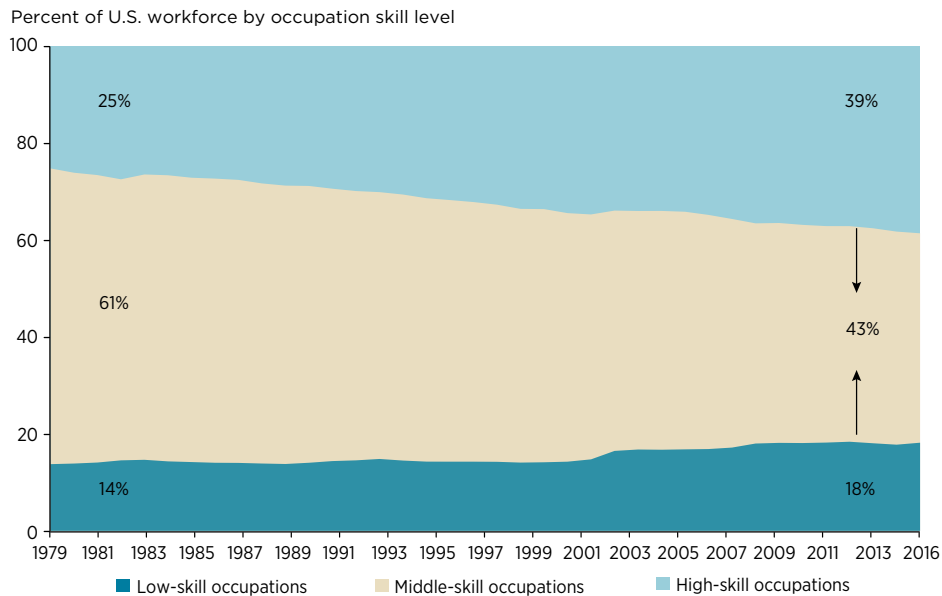
SECTION ONE

Labor Market Trends

Over the past three decades, the share of middle-skill jobs has been shrinking in the U.S. economy. These are jobs that require workers to perform repetitive and procedural tasks, such as those performed by assembly line workers at a manufacturing company or typists at an accounting office.¹ While the share of middle-skill jobs is still the largest share of jobs in the economy, job growth for middle-skill jobs is slowing. This is happening largely because computers and other machines are increasingly doing these routine tasks more efficiently and effectively and because some of these jobs are moving overseas.²

A result is increasing job polarization. The U.S. economy's share of middle-skill jobs is shrinking while its shares of low- and high-skill jobs are growing. High-skill occupations require analytical ability, problem-solving and creativity, while low-skill occupations require service-oriented and manually intensive labor. Chart 1 illustrates the shifting share of occupations by skill level since 1979.

Chart 1
Employment Shifts from Middle-Skill Occupations



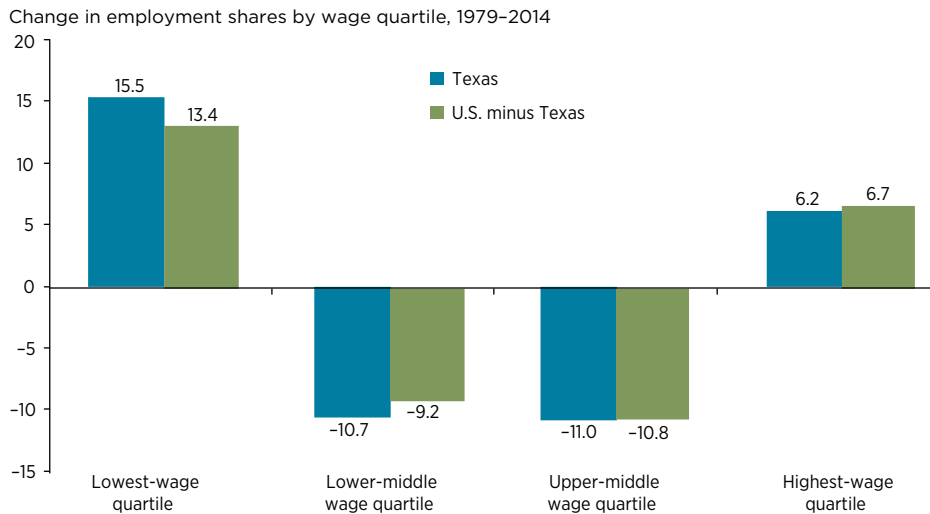
NOTE: Data are restricted to workers ages 16 to 64 who are not self-employed and are not employed in military or agricultural occupations.

SOURCE: The original chart is from "The Vanishing Middle: Job Polarization and Workers' Response to the Decline in Middle-Skill Jobs," by Didem Tüzemen and Jonathan Willis, Federal Reserve Bank of Kansas City, *Economic Review*, First Quarter 2013. The original chart has been updated to begin in 1979 and end in September 2016. Data were provided by Didem Tüzemen.

The Shrinking Middle Class

The narrowing share of middle-skill occupations is shrinking the middle class in Texas and the rest of the U.S. Chart 2 shows that from 1979 to 2014 the share of jobs in the lowest-wage quartile grew by 15.5 percent in Texas and 13.4 percent in rest of the U.S.³ At the same time, the share of jobs that paid middle wages dropped in Texas and the rest of the U.S., and the share of jobs in the highest-wage quartile increased by 6.2 percent in Texas and 6.7 percent in the rest of the U.S.

Chart 2
Wage Polarization, 1979–2014

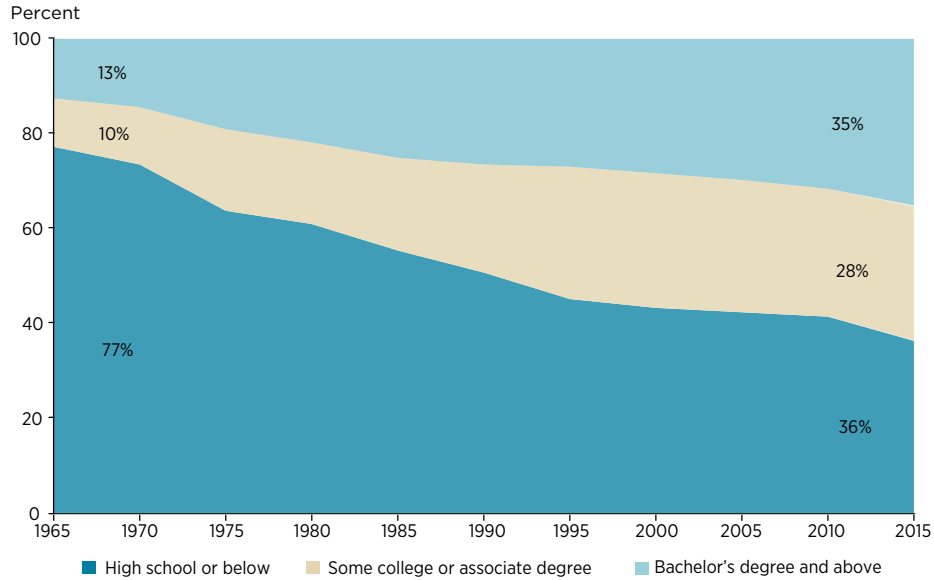


NOTES: Calculations include workers over age 15 with positive wages and exclude the self-employed. Quartiles based on the Texas and U.S. wage distributions from the 1980 decennial census, which refers to 1979 wages. SOURCES: 1980 Census; 2015 American Community Survey; "Employment Growth and Labor Market Polarization," by Melissa LoPalo and Pia Orrenius, in *Ten-Gallon Economy: Sizing Up Economic Growth in Texas* by Pia M. Orrenius Jesús Cañas and Michael Weiss, eds., New York: Palgrave MacMillan, 2015, pp. 91–105.

The decline of middle-skill jobs requiring routine tasks and the growing demand for analytical, critical-thinking and creative tasks in the labor market have occurred at the same time as an increase in levels of educational attainment—in Texas and the rest of the U.S. Chart 3 shows the increase in educational attainment among the Texas civilian workforce. Half a century ago, less than a quarter of Texas workers aged 25 and older had more than a high school diploma. By 2015, almost two-thirds of Texas workers aged 25 and older had more than a high school diploma.

A higher education has become paramount to getting higher-wage jobs. For example, according to the Georgetown University Center on Education and the Workforce, "the economy has added 11.6 million jobs since the recession bottomed out—11.5 million, or 99 percent of them, have gone to workers with at least some college education."⁴

Chart 3
Majority of Texas Workers Continue Their Education After High School



NOTE: These data refer to the civilian workforce aged 25 and older.
 SOURCE: Center for Public Policy Priorities' analysis of Current Population Survey iPUMS data, IPUMS-CPS, University of Minnesota, www.ipums.org.

One result of these trends in job polarization and educational attainment is that low-, middle- and high-skill occupations are increasingly defined simply by the level of educational attainment required rather than the skills, knowledge and abilities those credentials are intended to convey. Low-skill occupations typically represent jobs that do not require more than a high school diploma. High-skill occupations are those that require a bachelor's degree or more. In the middle are occupations that require education beyond a high school diploma—such as an associate degree, industry-recognized certification, apprenticeship program, on-the-job training or other workforce credential—but not a bachelor's degree.⁵

Ongoing Debate Among Some Labor Economists

There is disagreement among some labor economists about how employers are driving increases in educational attainment among the civilian U.S. workforce. Do more employers need a greater share of their employees to have postsecondary levels of education?⁶ Or, do employers find it difficult to assess the knowledge, skills and abilities that their workforce needs, so they use a bachelor's degree, for example, as a proxy for a job candidate's qualifications even when this degree is not necessary? A consequence of unnecessarily inflating job qualifications is that some employees and job seekers respond by pursuing potentially unnecessary degrees, credits or training.⁷

This debate highlights that businesses, workers, job seekers and the workforce development system would benefit from:

- Employers communicating their talent needs more precisely—in terms of knowledge, skills and abilities
- Educational institutions and training providers precisely communicating how their services align with employers' job requirements
- Students and job seekers easily identifying the return on investment of their training and educational choices to help decrease their opportunity costs.⁸

Given the growing need to seek educational and training opportunities beyond a traditional high school diploma—in large part to earn higher wages that can provide a family-sustaining wage—many job seekers are deciding to spend their savings, take out student loans and/or forego time that could be spent earning a wage and gaining valuable work experience. These are opportunity costs. And while it is important that all students receive a well-rounded education, it is essential that they also increase their value in the labor market and decrease their opportunity costs.

SECTION TWO

Building Regional Talent Pipelines in Texas: A Guiding Framework

Regional workforce development systems (*Box 1*) across the country have worked for decades to create advancement opportunities for lower-skilled workers and job seekers. More recently, these efforts have focused on the critical role of workforce intermediaries, which focus on a dual-mission of helping low-income individuals find a job and advance in a career, while also working with businesses to increase their productivity and improve their bottom line. In “Workforce Intermediaries for the Twenty-First Century,” Robert Giloth identifies a number of intermediaries, including partnerships that have emerged out of business associations, community colleges, unions, workforce boards and various other community organizations.⁹

Regions that leverage the efforts of workforce intermediaries to build world-class talent pipelines must accomplish three important tasks:

1. Identify businesses driving regional economic growth through **industry cluster analysis**.
2. Convene these business leaders with education and training providers through a **sector partnership** that identifies skill gaps and other labor market challenges for their industry.
3. Work together to create and strengthen **career pathways**, where needed, to provide a skilled workforce for their region and employment opportunities for their residents.¹⁰

Box 1

Entities in Regional Workforce Development Systems¹¹

- **Local workforce development board:** Lead, coordinate, implement and evaluate workforce initiatives to meet regional labor market needs
- **Community or technical college:** Provide training and education to prepare students for employment
- **University:** Provide education and research to support regional economic development
- **K-12 school:** Provide foundational skills and knowledge, exposure to career opportunities and infrastructure for workforce programs targeting in-school and out-of-school youth
- **Chamber of commerce:** Identify and represent the workforce needs of businesses
- **Business, business association or industry group:** Help ensure that the local talent pipeline meets business needs and provide data on hiring needs to educators regarding the skills, knowledge and credentials required for jobs, and training and employment opportunities.
- **Social service agency:** Provide a wide range of support to individuals—e.g., transportation, child care, health care, English as a Second Language (ESL) and adult basic education (ABE)—as they obtain or maintain employment
- **Community-based organization:** Provide training, job placement services and support services that connect to workforce development initiatives (e.g., food banks can provide food scholarships)
- **Labor group:** Represent and support the development of trained, skilled workers
- **Officials/administration of city, county, state and federal agencies:** Coordinate public resources to fulfill agency commitments toward workforce development goals
- **Philanthropic entity:** Provide financial and other support to pilot and scale workforce initiatives
- **Other community partner:** Connect mission and program activities to workforce development initiatives

NOTE: These definitions are from a workforce development vantage point, highlighting each entity's primary function within the system, and are not comprehensive.

SOURCE: "Engaging Workforce Development: A Framework for Meeting CRA Obligations," by Elizabeth Sobel Blum and Steven Shepelwich, Federal Reserve Bank of Dallas and Federal Reserve Bank of Kansas City, December 2016.

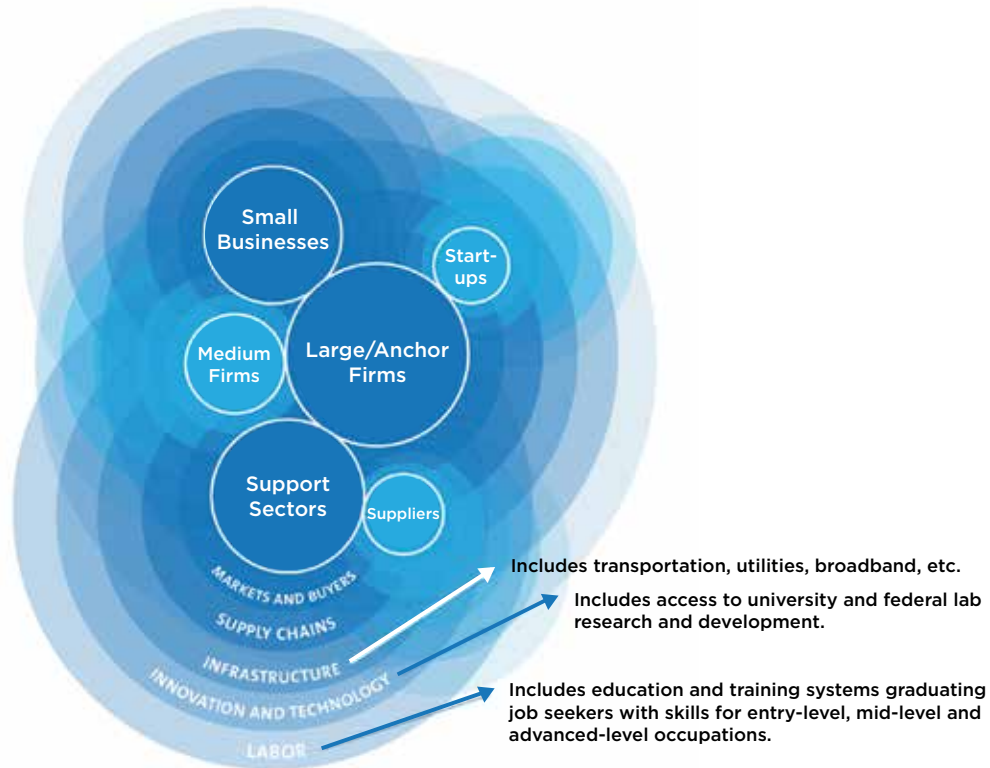
This section provides a broad descriptive framework of high-quality elements and outcomes of identifying industry clusters and developing sector partnerships and career pathways. When regional workforce development systems fully integrate these elements, they are building world-class regional talent pipelines.

Industry Clusters

In economic development research and practice, an industry cluster is a geographically concentrated group of businesses linked by the technologies they employ, the markets they serve, the goods and services they produce and the labor skills they require.¹² They generally include multiple interrelated industries and are critical to economic development practitioners because they provide an effective approach for analyzing the drivers of regional economic growth.

An industry cluster can be made up of several small, medium and large businesses (Figure 1). They include large anchor firms that attract similar companies to the region, as well as small start-up businesses that may spin off from larger companies or seek to replicate and innovate based on their products and services. These companies share a common geography that does not adhere to government boundaries such as city or county lines.

Figure 1
Identifying World-Class Industry Clusters



SOURCE: “State Sector Strategies Coming of Age: Implications for State Workforce Policymakers,” by Lindsey Woolsey and Garrett Groves, Corporation for a Skilled Workforce, National Skills Coalition and the National Governors Association Center for Best Practices, Jan. 16, 2013.

Industry clusters often form naturally and do not need to rely on any organizing entity to exist. Some of the most well-known include the information technology cluster in California known as Silicon Valley, and the oil and gas industry in the Houston and Midland–Odessa metropolitan areas. Each industry cluster is unique to its region and does not conform neatly to any general data set or simple definition. However, several industries are present in many economic regions across a state, such as health care, energy, information technology and advanced manufacturing.¹³

The Federal Reserve Bank of Dallas’ publication “At the Heart of Texas: Cities’ Industry Clusters Drive Growth” highlights the industry clusters of eight of Texas’ largest metros: Austin–Round Rock, Dallas–Plano–Irving, El Paso, Fort Worth–Arlington, Houston–The Woodlands–Sugar Land, McAllen–Edinburg–Mission, Midland–Odessa and San Antonio–New Braunfels. “Together, the eight accounted for 73 percent of the state’s population, 76 percent of its employment and 82 percent of its economic output in 2014.” It shows that in Austin–Round Rock, for example, “the underpinnings of [its] economy are government, which includes [the University of Texas] UT, and the technology industry. Computer manufacturing boasts four times the concentration in Austin than in the U.S. due to the significant presence of manufacturers of personal computers and related parts such as Dell, Apple, Advanced Micro Devices and Applied Materials.”¹⁴

Industry Clusters' High-Quality Elements

There are several common elements of the most well-connected businesses in a regional industry cluster. These include:

- **Common markets and buyers:** Businesses in an industry cluster have a common set of markets and buyers. Whether it is oil and gas firms, auto manufacturers or residential and commercial construction companies, businesses within each industry are subject to the same business cycles and external elements that affect supply and demand within their common markets.
- **Supply chains:** Businesses in an industry cluster rely on a common supply chain. For example, manufacturing clusters purchase similar raw materials from a common set of supply or support sectors. Fluctuations in price or shortages of goods, services or labor from an interdependent supply chain can have a direct impact on everyone in that cluster.
- **Infrastructure:** Every industry requires infrastructure of some kind to operate. In today's economy, this is as likely to include modern infrastructure needs for internet access or a low-cost supply of energy as well as a more traditional reliance on a transportation network. For example, businesses in a regional information technology cluster share a common need for high-speed internet access, and local manufacturing clusters are highly sensitive to changes in energy prices.
- **Innovation and technology:** Nearly every industry must spend time developing the products and services that will drive its growth in the future. Few companies are large enough to do this on their own, and instead may pool their resources or take advantage of public investments in the form of university centers or private research parks that specialize in industry-focused research and innovation. For example, the Houston petrochemical industry is able to use the research conducted at the Institute for Energy Research, the University of Houston Energy Research Park and the Advanced Energy Consortium to develop new commercial products and services.
- **Labor:** One of the most critical elements binding an industry together is its common workforce needs. Businesses in the same industry cluster will employ many of the same occupations and require many of the same skill sets. For example, it is no coincidence that the Houston metropolitan area, home to the nation's largest oil and gas industry cluster, exceeds the national average in engineering occupations, including chemical, marine, petroleum, mining and geological engineering.¹⁵

Industry clusters were brought to national attention during the 1990s, in part by the work of Harvard economist Michael Porter.¹⁶ As a state, Texas began to emphasize industry cluster analysis as a key part of its economic and workforce development systems at least as early as 1995, when the Texas workforce system prioritized industry sectors and key growth occupations for training.¹⁷ This focus was reinforced in 2005 when then-Governor Rick Perry launched the Texas Industry Cluster Initiative, a statewide effort that aimed to allocate state resources to advance long-term growth in six target industry clusters: advanced technologies and manufacturing, aerospace and defense, biotechnology and life sciences, information and computer technology, petroleum refining and chemical products, and energy.¹⁸

Today, the 28 local workforce boards in Texas each conduct an analysis of industry clusters as part of their strategic plan for regional workforce development. Depending on the size of the region, several other public and private entities may conduct their own analyses of industry clusters specific to their unique geographic regions, whether that is a city, county or larger economic region.

High-Quality Outcomes of Identifying Industry Clusters

According to Texas workforce boards' survey responses and interviews, there are three high-quality outcomes of a regional industry cluster strategy. Further research is recommended to identify additional high-quality outcomes and to quantify their impact. The high-quality outcomes identified include:

- **Coordinated analysis of regional industry clusters:** A set of industry clusters has been identified for a specified economic region or regions that most education, workforce and economic development partners in the region use to prioritize and organize their business engagement activities and their education and training efforts.
- **Identification of in-demand occupations:** A set of criteria has been established for identifying high-demand occupations within one or more industry clusters, and several regional workforce development entities use these occupations to guide their business engagement activities and their education and training efforts.
- **Shared implementation of a regional workforce development plan:** Industry clusters are prominently featured in a regional workforce development plan that has been co-created by several regional partners. The plan is not simply the workforce board's plan that other partners have signed on to or contributed to. Instead, each regional partner has direct ownership or oversight of portions of the plan, and those elements are built into their own internal plans and documents.

Sector Partnerships

Despite the presence of industry clusters in every region of the country, the businesses that make up those industries don't typically come together as a group to address a common problem, such as the absence of a supply of high-quality local talent or to help determine what career readiness means for a specific occupation. A sector partnership is a regional approach for organizing multiple businesses from one or more industries and connecting those businesses with education, training, economic development, labor, government and community organizations to collaboratively address economic and workforce needs.

Sector partnerships are an evidenced-based approach to workforce development that produce positive outcomes for both businesses and job seekers. A rigorous evaluation of three of these partnerships from 2003–05 found that job seekers trained through a sector partnership approach were more likely to earn higher wages and exit poverty than participants in other workforce training programs. They were also more likely to find employment in higher-quality jobs that provided access to health care, paid sick leave and vacation time.¹⁹ Businesses reported reductions in turnover costs, increases in productivity and overall satisfaction in their participation in the partnership. For example, a 2009 survey in Pennsylvania of businesses engaged in a sector partnership found that 84 percent reported increases in worker productivity.²⁰

In Texas, various sector partnerships exist throughout the state. When the 28 local workforce boards in Texas were surveyed in early 2016, 19 of them reported that sector partnerships are included in their strategic planning documents or at least one of their grant proposals for which they have won funding.²¹

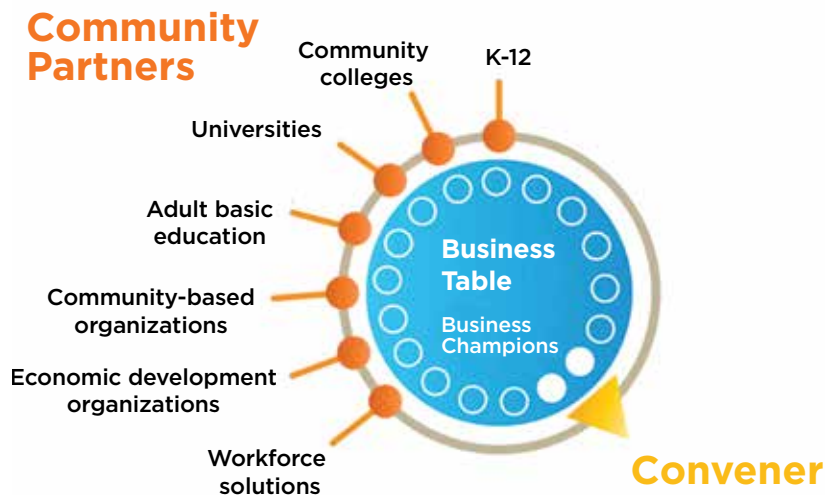
Across the U.S., sector partnerships have been gaining prominence as a local strategy for identifying and clarifying unmet skill needs of employers and aligning them with workforce training programs serving low-skilled unemployed individuals and underemployed workers. The reauthorization of the federal workforce development programs through the passage of the Workforce Innovation and Opportunity Act (WIOA) also emphasizes sector partnerships as a key strategy for local workforce boards, noting that it should be an approach that is included in every state's plan for engaging employers. According

to nonprofit organization Corporation for Economic Development (CFED), 21 states have such policies in place to support the local development of sector partnerships²² (Texas is not included in this list), and national networks such as the National Fund for Workforce Solutions and the National Network of Sector Partners work to advance sector partnerships across the country.²³

Sector Partnerships' High-Quality Elements

There are six quality elements of highly effective sector partnerships that can help local partners assess the strength of their business partnership strategies and identify areas for deepening business engagement (Figure 2).²⁴ These include:

Figure 2
Developing World-Class Sector Partnerships



SOURCE: "State Sector Strategies Coming of Age: Implications for State Workforce Policymakers," by Lindsey Woolsey and Garrett Groves, Corporation for a Skilled Workforce, National Skills Coalition and the National Governors Association Center for Best Practices, Jan. 16, 2013.

- **A common need or incentive to work together:** There is an opportunity or need that motivates several businesses to collaborate. This is particularly important for businesses that are more accustomed to competing against each other. Some challenges are so large that individual businesses are unable to address them on their own. In these cases, a sector partnership is the ideal approach for building trust and arriving at a solution that requires the involvement of several public, private and nonprofit partners.
- **A business table:** Business leaders convene regularly (usually from a single industry cluster) to discuss their common challenges and needs, while other community partners from the regional workforce development system (workforce boards, employers, chambers of commerce, community colleges, etc.) listen for opportunities to collaborate. Too often, the opposite dynamic unfolds in workforce partnerships: Business partners are invited to meetings led by education or workforce training partners, and the space is not provided for a business consensus to emerge on their most critical workforce challenges and potential solutions.
- **Nonworkforce needs:** In addition to discussing workforce shortages and skill gaps, the business partners have also identified industry challenges that may not be related to workforce needs. For example, supply chain problems, transportation costs, access to new markets, energy costs

or burdensome regulations could all be more urgent industry challenges. Working together to address the most critical need of businesses helps build trust and creates momentum within a new sector partnership for addressing other difficult problems.

- **Business champions:** Clearly identifiable business leaders are promoting the partnership's efforts and encouraging other businesses to participate. It is sometimes the case that one of these business champions may not be part of the same industry cluster, especially during the formation of a new sector partnership. Because companies within the same industry cluster are likely accustomed to competing against each other, they may be hesitant to trust one another when discussing the wages they pay their employees or the specific skill sets they are seeking. A prominent business leader from a different industry may avoid these concerns and have greater influence in the beginning of the partnership's formation.
- **A convener:** A single organization manages the partnership's activities and provides critical support by coordinating meetings and ensuring that activities are executed and progress is monitored. The convener is not the individual or organization receiving public recognition for leading the partnership. Instead, the convener is most likely operating behind the scenes to ensure that meetings are efficient and activities are effective. Several types of organizations may serve as the convener, including a local workforce board, a chamber of commerce, an industry association, a community college or nonprofit organization. Some sector partnerships may also decide to create their own support organization.
- **A support team of community partners:** A fully coordinated, comprehensive team of educators, community-based organizations, economic development organizations, workforce boards and other community partners act in unison and in joint support of the needs of industry and on behalf of students and job seekers.

While any organized group of businesses can organize its activities to function as an effective sector partnership, these quality elements help demonstrate how sector partnerships differ from most other business groups. Box 2 highlights examples of how sector partnerships are different from chambers of commerce, industry associations and advisory councils at a community college.

Box 2

Distinguishing Sector Partnerships from Other Business Groups

- **Sector partnerships differ from a chamber of commerce**, where activities and discussions are generally focused on the business community at large, and individual companies are rarely asked to discuss their specific growth challenges or hiring needs with other similar companies in great detail.
- **Sector partnerships differ from industry associations**, where education and training providers rarely participate or observe.
- **Sector partnerships differ from advisory councils at a community college**, where business representatives critique and review curriculum. While these councils can be effective at making incremental changes to classroom instruction materials and processes, they are generally not designed or intended to address large-scale challenges such as closing regional skills gaps, identifying missing occupational training programs or reallocating education and training resources to ramp up capacity or create a new program with shorter completion times and greater job placement rates.

High-Quality Outcomes of Developing Sector Partnerships

According to Texas workforce boards' survey responses and interviews, there are three outcomes of highly effective sector partnerships. Further research is recommended to identify additional high-quality outcomes and to quantify their impact. The high-quality outcomes identified include:

- **Common goals and measures of success:** Business partners have agreed upon a common set of goals and identified ways to measure progress toward attaining those goals. Examples of workforce goals and measures could include a target number of incumbent workers or job seekers trained to fill specified skill gaps, the identification of a set of skill standards that are used to modify course curriculum across the region or the creation of new apprenticeship positions and other learn-and-earn opportunities. These goals and measures are revisited regularly to identify where positive changes are occurring and to inform future activities.
- **Business systems change:** Business partners can identify how they are working together in new ways and changing how they do business. For example, they may be working together to share internal hiring practices, alter recruiting processes, change partnership agreements with contractors, donate equipment to schools or allocate resources to provide more internships for students, teachers and faculty.
- **Business engagement practices change:** Local education and training providers, economic development groups and other entities decide to alter their business engagement practices to better support or take advantage of sector partnership activities. For example, a community college may dissolve an advisory council and instead work with a new sector partnership to receive more detailed information on modifying programs or curriculum. Similarly, a chamber of commerce or workforce board may hire coordinators or staff to directly support a highly effective sector partnership or to help convene a new partnership.

Career Pathway Development

A career pathway is an approach to education and workforce development that connects students to progressive levels of course work, training and support services that lead to one or more credentials for a specific set of occupations.

Like a sector partnership, the career pathway approach has gained considerable national attention during the past decade. Various entities have sought to define the essential elements of high-quality career pathways. Some of these models advance an academically focused framework for building pathway programs, such as Complete College America's Guided Pathways to Success (GPS)²⁵ or the American Association of Community Colleges Pathways Project.²⁶ These models tend to emphasize aligning educational courses within a school or institution into programs or fields of study, creating clear pathways between institutions to ensure that students can transfer their academic credits from one school to another and advancing strategies to reduce the time required to attain a credential.

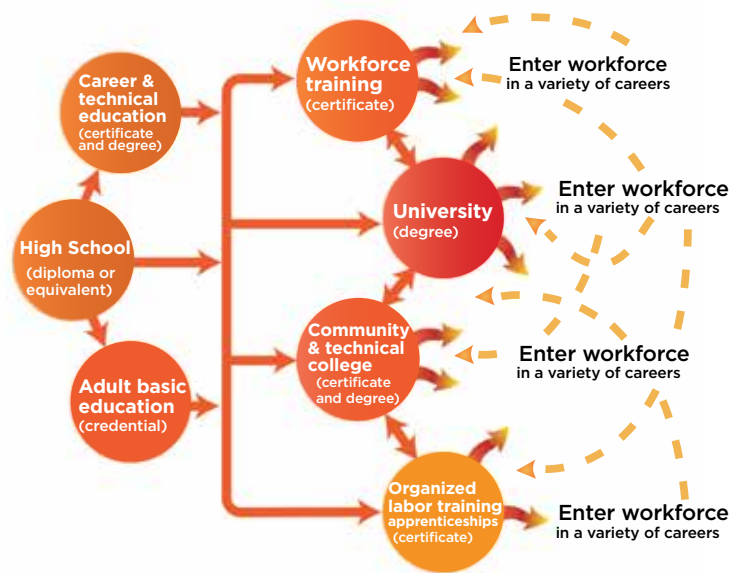
Other national organizations emphasize a strong focus on the career or employment aspect of these models. The U.S. Departments of Labor, Education, Health and Human Services and eight other federal agencies that issued a joint letter support career pathways that emphasize partnerships with businesses, create on-ramps for various underrepresented populations and ensure that the credentials produced have value in the labor market.²⁷

Career Pathways' High-Quality Elements

Regardless of the specific model used, there are several cross-cutting quality elements of highly effective career pathways that maintain a dual focus on improving academic pathways and ensuring that those pathways provide access to employment and career advancement. These are perhaps best

summarized by the Alliance for Quality Career Pathways, a multistate effort led by the Center for Law and Social Policy (CLASP) to identify common criteria for high-quality career pathways. The alliance identified three primary elements (*Figure 3*):²⁸

Figure 3
Developing World-Class Career Pathways



After being in the workforce, a person may choose to go back for more credentials to make an upward or lateral career move.

SOURCE: “State Sector Strategies Coming of Age: Implications for State Workforce Policymakers,” by Lindsey Woolsey and Garrett Groves, Corporation for a Skilled Workforce, National Skills Coalition and the National Governors Association Center for Best Practices, Jan. 16, 2013.

- **Well-connected and transparent education and training:** A career pathway consists of a set of education and training programs at successively higher levels of education that align with the employment and promotion requirements of several related occupations in an industry or industries. They also provide support services that help students persist along the pathway, transfer between institutions as needed and enter progressive levels of education and employment.
- **Multiple entry points:** Educators, trainers and other community partners ensure that career pathway programs are designed to enable well-prepared students, as well as targeted populations with limited education, skills, English or work experiences, to successfully enter the career pathway.
- **Multiple exit points:** Each student within a career pathway has access to exit points at successively higher levels that lead to self- or family-supporting employment. Each exit point is also aligned with subsequent entry points, allowing students to stop and restart their education and training as they are able.

In Texas, there are several local, state and nationally funded initiatives underway that are building academic and career-oriented pathways across the state. For example, Texas has a representative team of state and local officials that participate in the Pathways to Prosperity cross-state network supported by Harvard University and Jobs for the Future.²⁹ Together they are working to identify ways that state-level agencies and organizations can help support local partners in building career pathway programs, as well as align many of the disparate pathway efforts taking place in kindergarten through 12th grade (K-12) and postsecondary programs across the state.

There are also several career pathway efforts taking place at the state level. Some of these include the Texas Association of Community Colleges Career Pathway Project and the Texas Regional STEM Degree Accelerator led by Educate Texas and Accelerate Texas, a joint initiative of the Texas Workforce Commission and Texas Higher Education Coordinating Board.³⁰

High-Quality Outcomes of Building Career Pathways

According to Texas workforce boards' survey responses and interviews, there are four high-quality outcomes that can help local partners develop career pathways that include both an academic and career-focused framework. Further research is recommended to identify additional high-quality outcomes and to quantify their impact. The high-quality outcomes identified include:

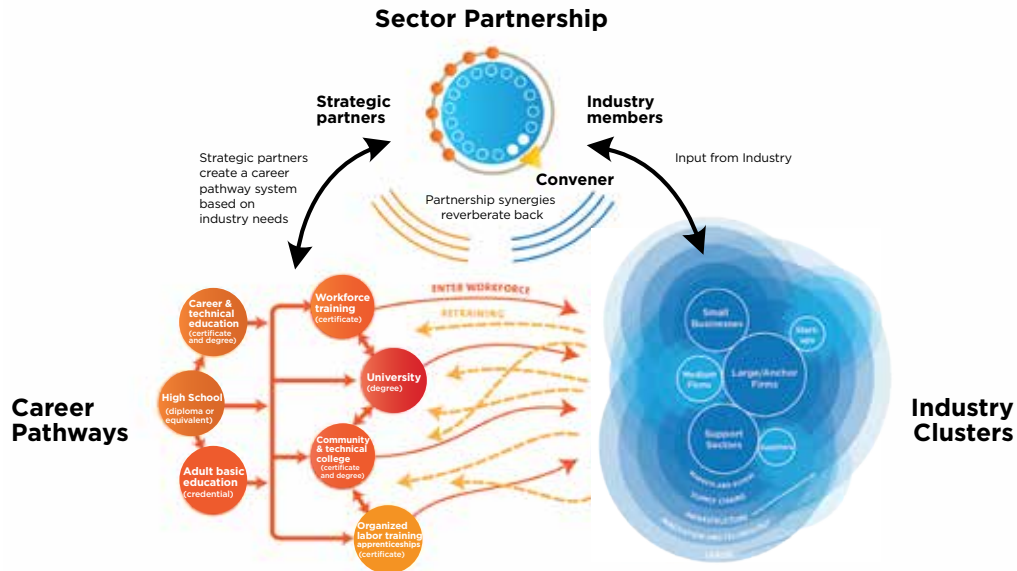
- **Education and training systems' responsiveness to industry:** Educational institutions and training partners are changing their practices as a direct result of feedback from businesses (e.g., new curriculum and instruction that incorporate the specific skill needs of industry, changes in postsecondary credentials, the realignment of educational programs and staff).
- **Improved recruitment and support services for students:** Student barriers to enrollment, program completion and job placement have been identified and addressed through the targeted deployment of outreach and support services (e.g., transportation, child care, job search, career counseling, financial counseling or coaching, academic tutoring outside of official class instruction, individual mentoring).
- **New work experience opportunities aligned with education and training programs:** Business partners and education and training providers are collaborating to create new opportunities for students to simultaneously improve their education and gain relevant work experience or earn a wage (e.g., paid or unpaid internships, apprenticeships, college work-study positions).
- **Documented completion and employment outcomes:** Education and training providers can document how many of their program graduates earn the degrees, industry-recognized certifications and other education and training demanded by industry, as well as how many graduates progress into employment opportunities in the field that they have been trained in and how many are earning a family-sustaining wage.

Regional Talent Pipelines: Collaborating with Industry to Build Career Pathways

While it is common to see industry cluster analysis, sector partnerships and career pathway approaches in education, economic and workforce development practice across the state, it is rare to see them achieve their full potential because entities in a region's workforce development system typically do not weave them together into a comprehensive workforce development strategy. When they do so, however, they are able to work on a broad scale to drive change across a regional education and training system, expanding the potential for economic growth and improving the prosperity of hundreds or thousands of job seekers and workers.

The National Governor’s Association, National Skills Coalition and Corporation for a Skilled Workforce jointly wrote “State Sector Strategies Coming of Age: Implications for State Workforce Policymakers,”³¹ which identified the following high-quality elements of world-class regional talent pipelines (*Figure 4*):

Figure 4
Developing World-Class Regional Talent Pipelines



SOURCE: “State Sector Strategies Coming of Age: Implications for State Workforce Policymakers,” by Lindsey Woolsey and Garrett Groves, Corporation for a Skilled Workforce, National Skills Coalition and the National Governors Association Center for Best Practices, Jan. 16, 2013.

- **Sector partnership approach:** There is a credible convener who has brought business leaders together to discuss challenges and barriers to growth, and also education and training providers who are prepared to respond to those industry needs for skills required in their businesses.
- **Industry cluster representation:** The business leaders who are designing the training and education programs to meet hiring needs through the sector partnership are also part of at least one industry cluster that has been identified by local partners as driving economic growth in the region.
- **Career pathway development:** The education and training partners that are working with business to identify specific skill needs are also working with secondary and postsecondary institutions in the region to create career pathway programs and initiatives to help students advance into higher-wage jobs.

When these quality elements come together, the potential exists to create powerful regional talent pipelines to help drive the local economy. These pipelines can dramatically improve the availability of a highly skilled workforce for an entire industry, while also moving many low-skilled or underemployed individuals into higher-paying jobs.

When effectively organized, sector partnerships can also become the principal connection point in their economic region for several programs and initiatives. There are several state initiatives emerging in Texas that could help strengthen regional talent pipelines. Some examples include:

- **House Bill 5, 83rd Texas Legislature:** State legislation in 2013 created new graduation paths for high school students with five new endorsement tracks designed to create greater college and career relevance for students. Several of these endorsement tracks require business involvement. Research from Texas A&M elevated the specific need for greater workforce partnerships with independent school districts.³²
- **Texas Industry Cluster Innovative Academies:** Governor Greg Abbott announced a new initiative in 2016 and requested \$7.2 million in funding to provide students in early-college high schools with greater access to applied learning opportunities, such as internships, externships, apprenticeships, mentorship programs and career counseling in high-demand occupations.³³
- **Texas College Work-Study Program:** Legislation passed during the 2015 session required postsecondary institutions to begin moving a portion of their state-supported work-study positions off campus and create opportunities for students to work with private employers.³⁴ Complying with this new legislation and creating a significant number of new, off-campus internships across the state will require new partnerships between colleges and local businesses. They will need to work together to ensure that each position advances both the student's career goals and the employer's workforce development goals.

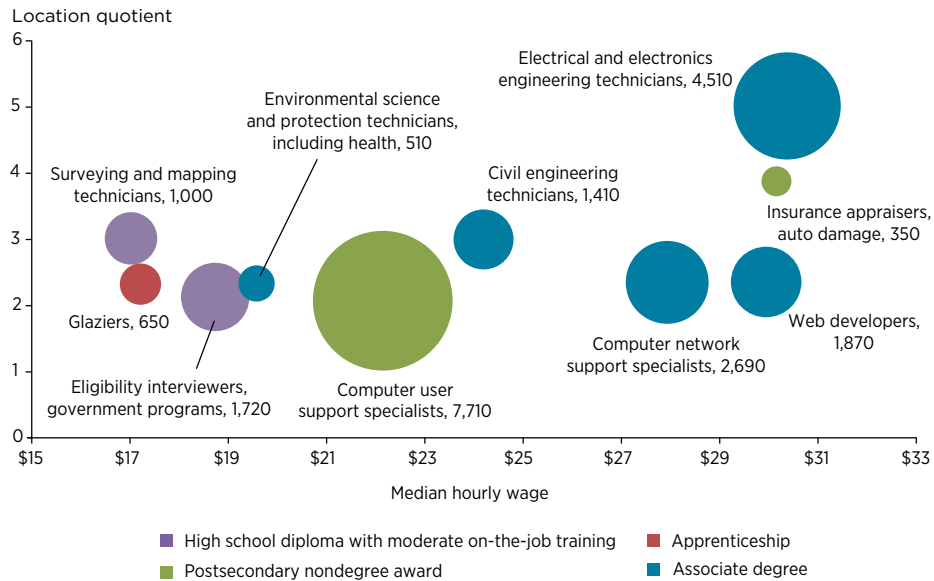
Sector partnerships are often the missing piece that can ensure that each of these initiatives is driven by the hiring needs of a particular industry, that they are kept up to date in a continually changing economy, and that all relevant initiatives and programs are coordinated to create a regional talent pipeline for that industry.

Building Regional Talent Pipelines to Opportunity Occupations

Critical to the success of career pathway and sector partnership development is the identification of high-wage, high-demand occupations that help drive economic growth in a region. The Federal Reserve Banks of Philadelphia, Cleveland and Atlanta released a joint paper in 2015 that identified **opportunity occupations** as those that pay a wage at or above the national median and require less than a four-year college degree.³⁵ Their analysis shows that while middle-skill opportunity occupations exist in every metro area, both the prevalence and type of occupations vary dramatically across economic regions.

For this reason, regional workforce development systems must analyze information on opportunity occupations, or other similar data on both middle- and high-skill jobs in their region, to identify where career pathway programs are needed to help move more individuals into higher-paying jobs. Economic development data can also be included—such as location quotients that help determine the regional industries or occupations with a competitive advantage compared with the national average—to identify target occupations that are also likely to help grow the economic prosperity of the region. (See Chart 4 for examples of opportunity occupations in the Austin–Round Rock metro area.)

Chart 4
Ten Most Dominant Opportunity Occupations in Austin–Round Rock Metro Area



SOURCE: Center for Public Policy Priorities' analysis of data from "Identifying Opportunity Occupations in the Nation's Largest Metropolitan Economies," by Keith Wardrip, Kyle Fee, Lisa Nelson and Stuart Andreason, Federal Reserve Banks of Philadelphia, Cleveland and Atlanta, Sept. 9, 2015.

In Chart 4, each bubble represents an opportunity occupation, and the size of the bubble is relative to the number of workers employed in that occupation. The 10 middle-skill opportunity occupations included in the chart have the highest location quotient in the Austin–Round Rock metro area. A location quotient of one signifies that the occupation has the same share of workers in the regional labor market as the United States economy. A location quotient of two signifies that the regional labor market has twice the concentration of workers in that occupation as the country as a whole. Occupations with location quotients greater than 1 can be used to identify areas where the regional economy has specialized and may be helping drive regional economic growth.

In the Austin–Round Rock metropolitan statistical area (MSA), 25.6 percent of jobs are opportunity occupations. Chart 5 shows the share of jobs that are opportunity occupations in each of Texas' largest MSAs. Opportunity occupations account for 15.5 percent to 30.1 percent of jobs in these MSAs. This chart also shows that the share of jobs that require a bachelor's degree and pay higher wages account for 14.6 percent to 24.1 percent of total jobs in these MSAs, and the share of jobs that do not require a bachelor's degree and pay lower wages account for 47.6 percent to 68.3 percent of total jobs in these MSAs. The variance in MSAs' employment distribution by education and wages highlights the importance of regional workforce development systems understanding their regional context and identifying their opportunity occupations so that they know where to target their industry-led career pathways.

**Chart 5
Presence of Opportunity Occupations Varies Across Texas Metros**



NOTE: Opportunity occupations are those that require more than a high school diploma but less than a bachelor's degree.
SOURCE: Federal Reserve Bank of Dallas' analysis of data from "Identifying Opportunity Occupations in the Nation's Largest Metropolitan Economies," by Keith Wardrip, Kyle Fee, Lisa Nelson and Stuart Andreason, Federal Reserve Banks of Philadelphia, Cleveland and Atlanta, Sept. 9, 2015.

SECTION THREE Workforce Development Activities in Texas: Survey Results

To identify how local communities are addressing job polarization and the associated challenges, the Federal Reserve Bank of Dallas and Austin-based nonprofit Center for Public Policy Priorities reviewed national best practices to provide a guiding framework for analysis, and then, in partnership with the Texas Association of Workforce Boards, sent a survey to the executive directors of the 28 regional workforce boards in May 2016.³⁶ The purpose of the survey was to identify the most innovative and robust career pathways in the state. It consisted of multiple-choice questions and a few open-ended questions that enabled the respondents to give more in-depth information. All 28 workforce boards responded to it, and responses were aggregated to preserve anonymity and enable the authors to see patterns in the data.

The workforce boards were selected for the survey because their mission places them at the center of much of the activity in their regional workforce system. They are charged with helping meet the labor needs of regional employers, creating good-quality jobs for the regional labor force and promoting regional economic development and competitiveness. Their major roles and responsibilities are to collect, analyze and share labor market data and other relevant information, contract with organizations that provide services to lower-skill/lower-wage individuals, convene workforce development entities and coordinate and leverage the activities of the workforce development system.

Workforce boards are mostly funded by the [Texas Workforce Commission \(TWC\)](#), which is governed by three commissioners. One commissioner represents employers, another represents labor and another

represents the public. TWC sets the state’s workforce development parameters, policies and priorities. Through performance-based contracts, TWC provides grants to the workforce boards, which decide how to implement WIOA within their regions.

The survey asked the boards about their goals and objectives, how they meet them and if and how they measure them. Specific questions asked about their areas of emphasis, the populations they serve, which education, training and service providers they partner with, the strategies they use, if they are increasing the availability of learn-and-earn opportunities and support services and which technical assistance they are interested in accessing.

This section gives general observations of the boards’ activities and then highlights the most promising practices and opportunities for improvement in the state of Texas.³⁷

The Texas Workforce System: General Observations

Observation No. 1

Workforce Boards’ Goals and Objectives Continue to Emphasize Their Roles as a Convener and Intermediary

The workforce boards’ most common goals and objectives include:

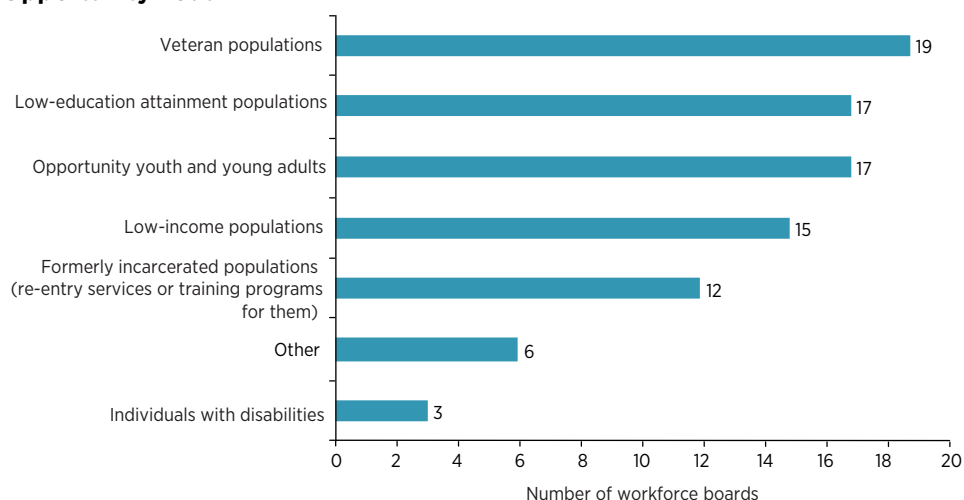
- Transforming into an employer-driven/market-driven system
- Increasing communication, partnership, alignment, coordination, leverage or integration with/ between employers, chambers of commerce, educational providers and other workforce development partners
- Continually improving the quality of service to both employers and job seekers.

Observation No. 2

Workforce Boards Provide Services to Populations Who Face Major Hurdles to Advancing Along Career Pathways

The populations that Texas’ workforce boards most commonly focus on are veterans, low-education attainment populations, opportunity youth and young adults (youth and young adults disconnected from education and employment), low-income populations and formerly incarcerated populations (*Chart 6*).

Chart 6
Workforce Boards Serve Veterans, Low-Educated Populations and Opportunity Youth



NOTES: “Opportunity youth” refers to youth and young adults disconnected from education and employment. Respondents could check more than one box.

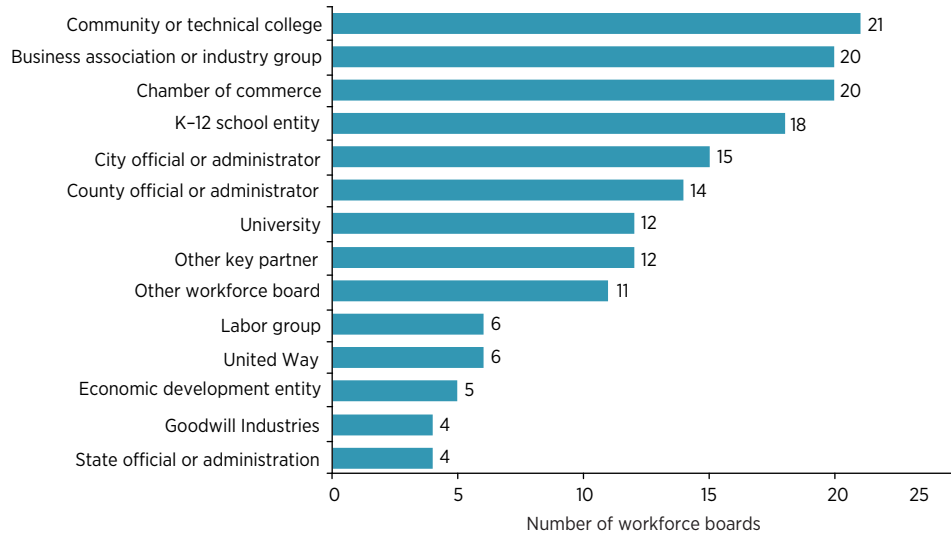
SOURCE: “Promising Practices in Workforce Development in Texas,” a survey by the Federal Reserve Bank of Dallas and Center for Public Policy Priorities in partnership with the Texas Association of Workforce Boards, 2016.

Observation No. 3

Workforce Boards Partner with Key Workforce Development Entities

Twenty-three of Texas' 28 workforce boards report that they are partnering with organizations to create, design or implement a regional strategic plan for workforce development at the regional level. The most commonly cited partners are education providers (community or technical colleges and K-12 school entities), industry (business associations or industry groups and chambers of commerce) and government (city or county officials or administrators) (*Chart 7*).

Chart 7
Workforce Boards Partner with Educators, Industry and Government



NOTE: Respondents could check more than one box.
SOURCE: "Promising Practices in Workforce Development in Texas," a survey by the Federal Reserve Bank of Dallas and Center for Public Policy Priorities in partnership with the Texas Association of Workforce Boards, 2016.

The Texas Workforce System: Promising Practices

There are a number of ways that Texas' workforce boards are planning or implementing the high-quality elements of world-class regional talent pipelines. These promising practices are detailed below.

Promising Practice No. 1

In Their Strategic Planning Process, Most Boards Use a List of Industry Clusters— a Fundamental Element of Building Regional Talent Pipelines

In Texas, 24 workforce boards use a list of industry clusters in their region for strategic planning purposes, which can help prioritize employer outreach or identify in-demand occupations or skills gaps. The industry clusters with the greatest number of active sector partnerships are health/health care, manufacturing and construction. In this case, an active sector partnership means that multiple employers are 1) meeting as a group to identify and discuss workforce development needs or challenges that they share in common, and 2) working with education, training and/or other service providers to address those needs or challenges.

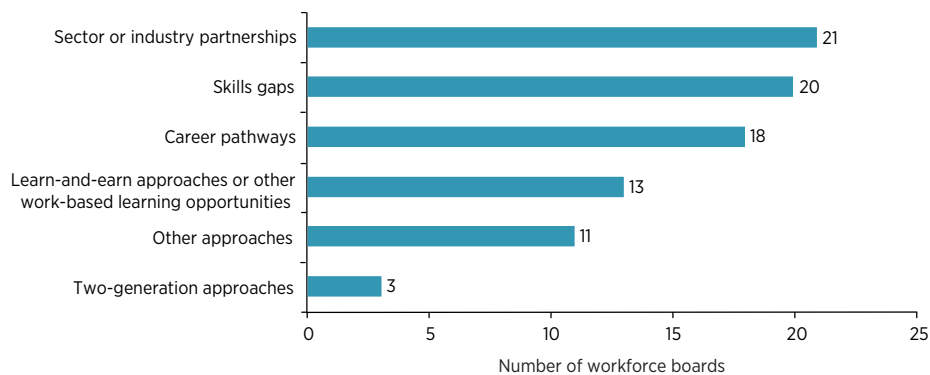
Promising Practice No. 2

Their Strategies Prioritize Sector Partnerships, Career Pathways and Other High-Quality Elements of Regional Talent Pipelines

While Texas workforce boards' strategic plans differ, their most common areas of emphasis are sector or industry partnerships, skills gaps and career pathways (*Chart 8*). Twenty-four workforce boards are familiar with sector partnership approaches to workforce development, and 19 boards include sector partnerships in their strategic plans or grant proposals for which they have won funding.

In addition, 23 boards include career pathways in their strategic planning documents or at least one of their grant proposals for which they have won funding. When asked how many career pathway initiatives they are currently part of, their responses varied widely, from "just getting started" to "16 initiatives" to "multiple." The industries or occupations that are most commonly targeted by these career pathway initiatives are mostly in health/health care and information technology, followed by manufacturing, welding, education and construction.

Chart 8
Workforce Boards Emphasize Sector Partnerships, Skills Gaps and Career Pathways



NOTE: Respondents could check more than one box.
SOURCE: "Promising Practices in Workforce Development in Texas," a survey by the Federal Reserve Bank of Dallas and Center for Public Policy Priorities in partnership with the Texas Association of Workforce Boards, 2016.

Promising Practice No. 3

Regional Sector Partnerships' Work Aligns with Regional Workforce Development Plans

The workforce boards identified a total of 52 sector partnerships in their regions. While the survey did not assess how robust these sector partnerships are, the boards reported that 44 of them have a common agenda, goal or objective that is specific to workforce development, and their respective agendas/goals/objectives align with their regional plans. Alignment is critical to regional workforce development entities working in concert with each other toward a common goal.

Promising Practice No. 4

Many Partnerships Offer Learn-and-Earn Opportunities and Support Services

Regional sector partnerships throughout Texas are developing and supporting career pathways that are industry-led. Table 1 shows that they are doing so by increasing the availability of learn-and-earn opportunities and support services.

Table 1
Sector Partnerships Support Learn-and-Earn Opportunities and Services

Number of partnerships	Types of opportunity or service
47	Identify specific in-demand occupations or skills gaps that employers are having difficulty filling
40	Create a list of in-demand degrees, certificates or licenses according to employers' input
40	Assess the capacity of regional education and training programs to provide skilled workers for specific in-demand occupations
40	Verify the precise skills, knowledge, competencies or work functions employers require for certain occupations for use in an educational or job training program
32	Increase the availability of wraparound support services to help individuals in targeted education or training programs (e.g., transportation, child care, job search, career counseling, financial counseling or coaching, academic tutoring outside of official class instruction, individual mentoring)
24	Increase the availability of paid or unpaid internships
24	Increase the availability of transitional jobs programs (subsidized temporary jobs designed to teach workplace skills and provide work experience)
23	Increase the availability of technology or equipment needed in instructional settings for specific occupations
18	Increase the availability of summer employment opportunities for youth
18	Increase the availability of apprenticeships
16	Increase the availability of job shadowing opportunities
10	Increase the availability of college work-study positions outside of the college
8	Increase the availability of other learn-and-earn opportunities (e.g., on-the-job training)
8	Participate in other career pathway activities

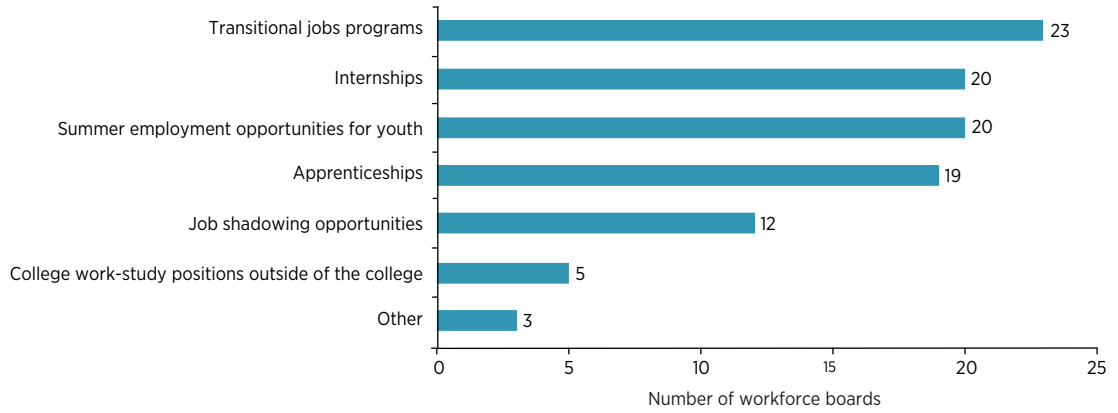
SOURCE: "Promising Practices in Workforce Development in Texas," a survey by the Federal Reserve Bank of Dallas and Center for Public Policy Priorities in partnership with the Texas Association of Workforce Boards, 2016.

Promising Practice No. 5

Workforce Boards Plan, Implement or Expand Learn-and-Earn Programs

Even if they are not part of a sector partnership, all of the workforce boards are planning, implementing or expanding programs to increase the number of employers offering learn-and-earn opportunities. The most popular types of these opportunities among the boards are transitional jobs programs, internships, apprenticeships and summer employment opportunities for youth (*Chart 9*).

Chart 9
Workforce Boards Expand the Number of Learn-and-Earn Opportunities



NOTES: Respondents could check more than one box. Transitional jobs are designed to teach workplace skills and provide work experience.

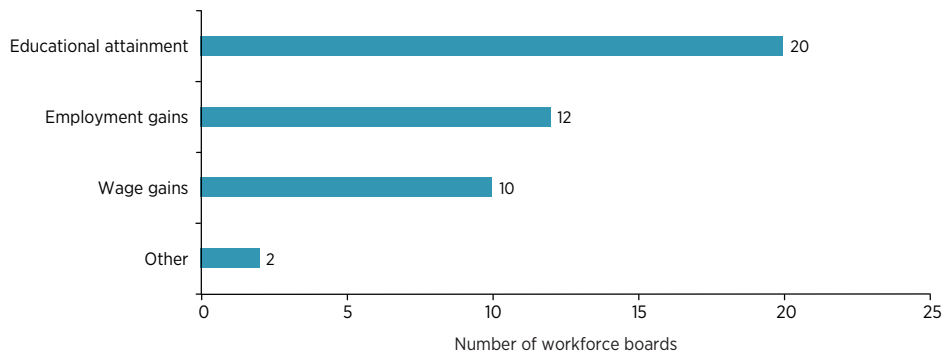
SOURCE: "Promising Practices in Workforce Development in Texas," a survey by the Federal Reserve Bank of Dallas and Center for Public Policy Priorities in partnership with the Texas Association of Workforce Boards, 2016.

Promising Practice No. 6

Workforce Boards Participate in Collective-Impact Initiatives

Twenty-one boards are engaged in at least one collective-impact initiative (*Chart 10*). In this model, community members work together to address a specific problem. They identify a common goal, decide on shared metrics to monitor their progress and coordinate efforts to address that problem.³⁸ Of the 44 collective-impact initiatives in which the boards are leading or participating, 20 of the initiatives focus on educational attainment, 12 of the initiatives focus on employment gains and 10 of the initiatives focus on wage gains.

Chart 10
Most Workforce Boards Are Engaged in Collective-Impact Initiatives



NOTE: Respondents could check more than one box.

SOURCE: "Promising Practices in Workforce Development in Texas," a survey by the Federal Reserve Bank of Dallas and Center for Public Policy Priorities in partnership with the Texas Association of Workforce Boards, 2016.

The Texas Workforce System: Opportunities for Improvement

While there are a number of ways that Texas' workforce boards are planning or implementing the high-quality elements of world-class regional talent pipelines, there are a number of opportunities for improvement. Some of them are detailed below.

Improvement Opportunity No. 1

Identify a Baseline and Set Metrics to Track Improvement

Benchmarks are critical because activities that are measured are generally more likely to get done than activities that are not measured. In addition, it is difficult to attract more businesses, chambers of commerce, educators and other key entities into partnerships without established benchmarks and demonstrated success.

Only 13 workforce boards have identified program or project outcomes beyond those required by the federal or state government. Examples of such outcomes include increasing the number of customers who earn a target wage after training or improving the percentage of individuals receiving training who then obtain training-related employment. Of the workforce boards that have identified such outcomes, only four established or are establishing benchmarks to track improvement on any of these outcomes.

Improvement Opportunity No. 2

Develop a Process to Allow the Number of Industry-Recognized Certifications to Grow to Scale

A primary element of high-quality career pathways is the identification of industry-recognized certifications that have value in the local labor market. But to increase the number of programs offering students certifications with labor market value, businesses must be able to identify or provide feedback on new certifications and convey that information to area schools, colleges and training programs that are providing the education and training required for these credentials.

Eighteen workforce boards have a process for creating and/or updating a list of industry certifications that are recognized by employers in their region. In addition, five workforce boards reported that they are working on implementing a process to create a list of industry-recognized certifications. There is a variety of criteria that boards use to determine if an industry certification is “recognized” (*Box 3*). When asked how many industry-recognized certifications are part of their lists, their responses varied widely, from indistinct (e.g., “not sure” and “varies due to market demand”) to several, about a dozen, over 20, over 40 and hundreds.

What matters more than the number of certifications is their quality: Regardless of how many industry-recognized certifications the boards have, what's most important is how they determine that the certifications are used by employers to make their hiring decisions. More workforce boards need to communicate with employers to determine which certifications are most valuable to them.

Box 3

How Workforce Boards Determine if an Industry Certification is “Recognized”

- Accepted by multiple employers as required or preferred criteria for employment
- Endorsed by a local trade or industry-led group
- Approved by state or U.S.
- Recognized by local community colleges
- Recognized or conditionally recognized by the Texas Skill Standards Board
- Identified through labor market indicators and statistics, then modified based on employer requests and foot traffic coming into workforce solution centers

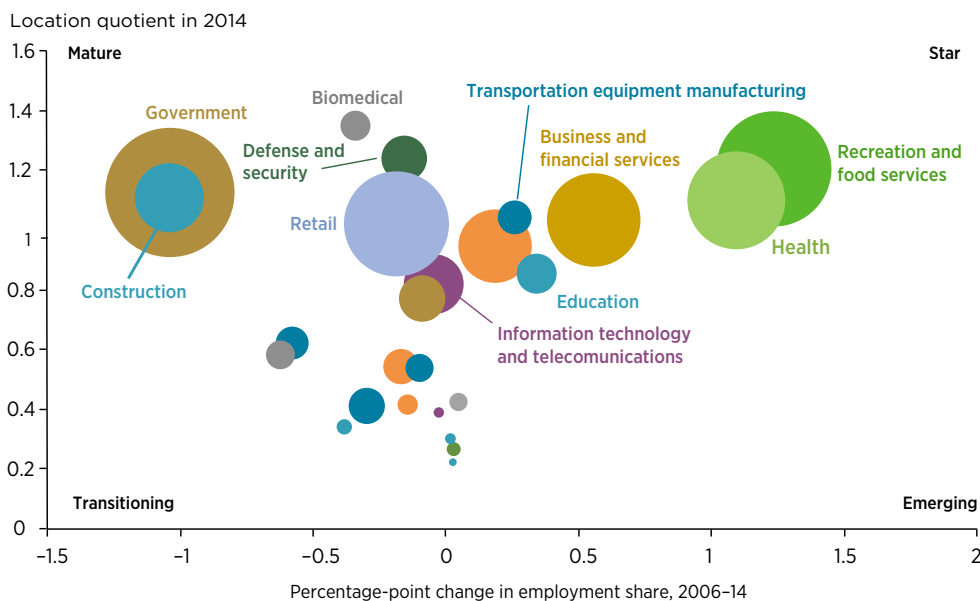
Improvement Opportunity No. 3

Develop Career Pathways to Each Region’s Strong Regional Industry Clusters

One opportunity for regions’ improvement is to develop career pathways that are aligned with sector partnerships in each of their strong industry clusters, especially those in which they have a regional competitive advantage and are projected to grow.

In “At the Heart of Texas: Cities’ Industry Clusters Drive Growth,” the Dallas Fed identifies industry clusters in eight Texas metropolitan areas and categorizes them as mature, transitioning, emerging or star.³⁹ A mature industry cluster has a regional competitive advantage because it is more dominant locally than nationally; it is growing slowly. A transitioning industry cluster does not have a regional competitive advantage because it is less dominant locally than nationally; it is growing slowly. An emerging industry cluster does not have a regional competitive advantage but is growing fast. A star industry cluster has a regional competitive advantage and is growing fast—this type of cluster is ripe for career pathway opportunities. Chart 11 highlights San Antonio–New Braunfels’ industry clusters.

Chart 11
San Antonio–New Braunfels Industrial Composition Is Diverse



NOTE: Bubble size represents cluster share of metropolitan statistical area employment.
SOURCES: Texas Workforce Commission; Bureau of Labor Statistics, as used in “At the Heart of Texas: Cities’ Industry Clusters Drive Growth,” by Laila Assanie, Kristin E. Davis, Pia M. Orrenius and Michael Weiss, Federal Reserve Bank of Dallas, February 2016, <https://dallasfed.org/research/heart/dallas>.

In the survey, Texas' 28 workforce boards were asked to identify their most innovative and/or robust sector partnerships. The most common industry listed was health/health care. This is good news because this industry has a regional competitive advantage and/or is growing fast in all but one of the state's eight largest metros.

There are a number of other industries that also are ripe for partnership opportunities—especially those that are star industries. The star industry clusters in Austin–Round Rock include information technology and telecommunications; in Dallas–Plano–Irving they include business and financial services; in El Paso and McAllen–Edinburg–Mission they include retail; in Fort Worth–Arlington, Houston–The Woodlands–Sugar Land and Midland–Odessa they include mining and energy; and in San Antonio–New Braunfels they include recreation and food services. Untapped opportunities in all of Texas' regional star industries serve as opportunities for improvement.

Improvement Opportunity No. 4

Partner with Other Groups to Develop Both Strategic Plans and Metrics

Twenty-three workforce boards report that they are partnering with other groups to create, design or implement a strategic plan for workforce development at the regional level. Virtually all of these plans have an overarching goal or set of objectives, but only 12 of them include a set of metrics or indicators that are used to measure progress on the goals or objectives. Metrics are important because they indicate progress or lack of it and make it easier to communicate the purpose of the plan to potential partners.

Improvement Opportunity No. 5

Expand Partnerships with Employers in Their Regions and Access Technical Assistance

A majority of the workforce boards expressed interest in receiving technical assistance (TA) on how to incentivize employers to partner with them. This interest suggests that the full potential for employer engagement is not yet realized, particularly when it extends beyond responsive forms of employer engagement to proactive and strategic forms of engagement, such as creating sector partnerships and building industry-led career pathways. Table 2 shows a detailed list of the types of TA that the boards would like to receive.

Table 2
Workforce Boards Are Interested in Accessing Technical Assistance

Number of workforce boards	Types of technical assistance
15	Incentivizing employers to partner with them
13	Having a process to create or update a list of industry certifications that are recognized by employers in their region
13	Implementing career pathways that are aligned with sector partnerships
11	Establishing benchmarks for tracking continuous improvement
11	Planning, implementing or expanding programs that increase the number of employers offering learn-and-earn opportunities
10	Creating, designing or implementing a regional strategic plan for workforce development
10	Supporting existing sector partnerships or creating new partnerships in their region
8	Using two-generation approaches
6	Redesigning how they deliver services to clients
5	Identifying occupations or industries to focus on
5	Providing financial coaching or counseling for workforce participants
4	Participating in collective-impact initiatives
1	Offering apprenticeships

SOURCE: "Promising Practices in Workforce Development in Texas," a survey by the Federal Reserve Bank of Dallas and Center for Public Policy Priorities in partnership with the Texas Association of Workforce Boards, 2016.

SECTION FOUR

Case Studies of Promising Practices in Texas

The following case studies show how some Texas regional workforce development systems are building regional talent pipelines. This is not an exhaustive list. It was selected based on the quality of information gathered from survey responses and follow-up interviews with the boards that indicated that they were putting quality elements of a regional talent pipeline into action. Of these strong examples, three from different environments were chosen to show how workforce development systems from various environments can learn from each other's successes.

Houston

The Gulf Coast Workforce Board has helped lead the development of sector partnerships since the late 1990s. Over the years, it has supported several partnerships focused on solving workforce challenges for industry, including working with health care, major integrated oil companies, industrial construction, aerospace and school districts. Currently, the Gulf Coast Workforce Board has partnered in a new workforce development effort led by the Greater Houston Partnership (GHP) titled "UpSkill Houston." Though specific to the Houston area, this project provides a helpful illustration of the development of a regional talent pipeline in practice.

Upskill Houston is currently identifying workforce challenges and helping to organize or support activities in three industry clusters: health care, industrial construction and petrochemical industries. This case study will focus on the petrochemical partnership, which serves as a strong current example of businesses working with education and training providers to build talent pipelines for their industry.

Petrochemical Industry Cluster

The petrochemical industry in southeast Texas manufactures resins used in chemical and plastic products around the world. There are more than 700 small, medium and large establishments in the industry, which formed around the oil and gas exploration and extraction infrastructure of the Texas Gulf Coast region.⁴⁰ Because of advancements in technology, including fracking, which opened up new oil and gas resources throughout the region, many of these companies changed their business strategy four years ago. Rather than ride out the existing life of their buildings and infrastructure and then move overseas, they instead began to reinvest in their facilities to modernize and expand their production capacities. More than \$50 billion has been invested in new plants and infrastructure in 2016 alone. This shift created a new and urgent workforce challenge. The existing workforce was aging and approaching retirement, and the new plants and technology coming online required new skill sets and training programs that weren't readily available in the region.

Sector Partnership-EHCMA

The East Harris County Manufacturers Association (EHCMA) represents 130 large and small companies in the region's petrochemical industry.⁴¹ In response to these growing workforce challenges, EHCMA's workforce subcommittee began to coordinate its activities with the local regional economic development entity, the Economic Alliance Houston Port Region and the San Jacinto and Lee Colleges, which provided most of the education and training programs for the industry.

“In the past, industry didn’t want to share proprietary information on hiring and skill sets. But now these companies are seeing that their workforce challenges are bigger than any one company, and that by working together, everyone can win.”

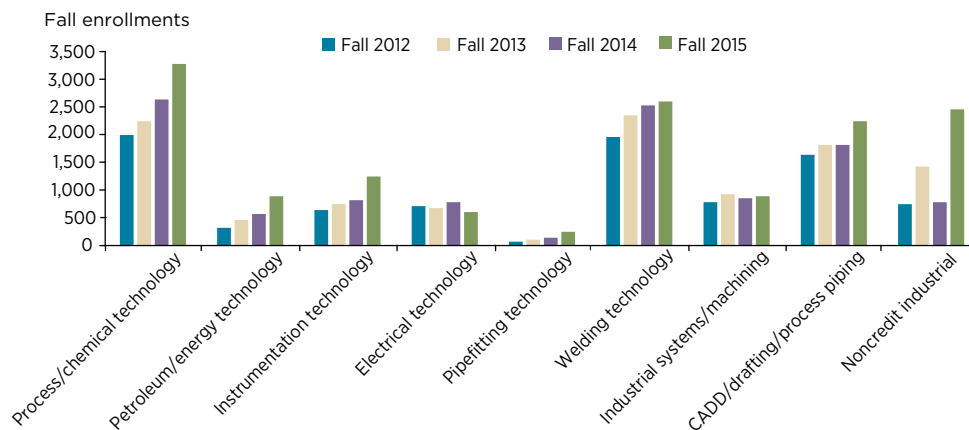
Allatia Harris
 Vice Chancellor of Strategic Initiatives, San Jacinto College

These partners began working together to conduct a survey of EHCMA members on workforce challenges and hiring projections. At about this time, ExxonMobil funded a grant for all nine colleges in the Greater Houston region to work together to coordinate and align their work as part of the Community College Petrochemical Initiative (CCPI). CCPI supported the colleges in recruiting people to the industry and in strengthening their curricula and the development of their faculty. The Greater Houston Partnership also began building bridges with the petrochemical effort through its Upskill Houston project. Together these partners all came together and provided the means to identify and consolidate industry feedback on specific workforce challenges and then connect with area community colleges that were prepared to reevaluate their programs and respond in a new way to industry demands.

Industry-Led Career Pathway

EHCMA and its partners identified student awareness of job opportunities in the industry as a major obstacle and began expanding and coordinating student recruitment efforts, primarily at high schools across the region. With the support of JPMorgan Chase Foundation, EHCMA developed PetroChemWorks.com to help students explore careers in the industry and to connect to education and training. They also worked directly with the colleges to increase tracking of enrollment and completion data. For example, Chart 12 shows the number of enrollments and the progress during the past three years in nine occupations identified as high-demand areas by EHCMA’s members.

Chart 12
Community College Petrochemical Initiative Increases Enrollments



NOTE: CADD is computer-aided design and drafting.
 SOURCE: Data provided by all nine colleges participating in the Community College Petrochemical Initiative in the Texas Gulf Coast Area: Alvin Community College, Brazosport College, College of the Mainland, Galveston College, Houston Community College, Lee College, Lone Star College, San Jacinto College and Wharton County Junior College.

A second challenge was a shortage of trained faculty. Qualified teachers could earn more in the industry than the classroom, and a solution required partnering with businesses in new ways. This included recruiting retirees into the classroom, encouraging current employees to teach a lab or other course on a regular basis and providing externships for current faculty to increase their awareness of the job skills required.

The progress and momentum earned from these initial and successful activities have begun to transform the way that colleges in the region are operating. For example, EHCMA and its college partners realized that a new education facility and training equipment were needed. As a partial response, San Jacinto Community College included these items as a major component of a successful \$459 million bond campaign in November 2015. Working with industry was critical to winning approval of the bond, because the industry represents 51 percent of the college's tax base.

“This approach to working with industry is different than how we’ve done it my entire career, and it’s working.”

Allatia Harris

Vice Chancellor of Strategic Initiatives, San Jacinto Community College

San Jacinto Community College then formed a chancellor's advisory group after the bond passed and hired an industry representative as a liaison to work closely with petrochemical businesses to create the new training center and facility. This work includes a subcommittee that is looking at credentials, aligning them with industry-based in-house training and identifying equipment needs and upgrades required for the colleges. The subcommittee's initial focus is on six high-demand occupations that industry partners identified (e.g., instrumentation, nondestructive testing).

Through this process, the largest petrochemical companies have seen their employment practices of hiring away the best talent from their supporting contract companies is disruptive to the industry, as well as to workers seeking a smooth, steady and logical advancement process. The industry is now talking collaboratively about hiring practices and figuring out how to formalize employee advancement pathways that benefit the industry as a whole. In addition, the petrochemical manufacturers are engaging with their industrial contractors about key practices and obstacles that affect the ability of the construction firms to train and develop their workforce. The collaboration among the petrochemical manufacturers themselves and with the key supplier of construction services is something the region has never done before.

EHCMA is formalizing the governance for this work and creating critical work groups to address these key challenges. This structure is intended to increase the effectiveness of its work and engage more of EHCMA's membership to participate in and support its collective workforce efforts.

West Central Texas

A large regional workforce partnership has formed in west central Texas. Three local workforce development boards (Concho Valley, Permian Basin and West Central Texas) have coordinated their efforts in support of more than 1,200 companies in the oil and gas, wind and solar energy sectors covering 60,000 square miles in rural west Texas. Together the industry employs a civilian labor force of a half million and includes 49 counties, eight community colleges, 118 independent school districts and the cities of Midland, Odessa, San Angelo and Abilene.⁴²

Energy Industry Cluster

Due in part to its large rural geography, the west central Texas energy industry has difficulty recruiting, training and retaining skilled workers. Companies might find qualified employees working for a competitor and recruit them with a pay raise or better benefits, but this does little to increase the overall pool of talent for the region. Employers also report challenges navigating and coordinating training courses at each of the community colleges serving the region. Energy industry employees in West Texas are often asked to relocate. However, each college has different curriculum, course requirements and rules for accepting credits from other colleges. This means that when employees move 50 or more miles to a new job site, they may discover that few if any of their college credits transfer to the new

community college program. Furthermore, several companies report that they aren't sure which college programs provide the best alignment with the skill sets needed for specific occupations, nor do they have a way of assessing the difference between a certificate from one college and another without talking to each one individually and working extensively with their graduates.

“We’re not able to draw a lot of people to our region. We’re going to have to grow our own, and to do that we must build our own talent pipeline.”

Mary Ross

Executive Director, Workforce Solutions of West Central Texas

Sector Partnership—West Texas Energy Consortium

The West Texas Energy Consortium is a membership organization created in 2013. It originally formed because a number of energy companies had received economic incentives to locate or expand their operations in the region, and they were having difficulty meeting the hiring targets specified in those agreements. However, after coming together and discussing labor shortages, the member companies soon realized that they might also work together to address several other issues.

These companies were very clear that while they needed to coordinate their activities to address some of these larger workforce challenges, they also needed a separate organization to provide a home for their activities and prevent the impression that any one company wasn't telling others what to do. As often happens with the creation of new sector partnership efforts, the business champion who initially convened the early consortium members was from outside the regional industry. Though he was an executive in the oil and gas sector, his company didn't operate in the West Texas region. That was important because he wasn't seen as a direct competitor, which helped create trust among the other business leaders and allayed concerns that anyone might be trying to win a competitive advantage. It also helped that he not only had earned the respect of his business peers, but that he also had existing relationships with many city officials, county judges, railroad commissioners and others. This helped bring together the necessary partners and move the consortium forward during the first 12 to 18 months.

Today the consortium promotes public awareness of the careers and training opportunities available in the industry, encourages community and economic development and facilitates communication and partnerships among business, education, government, economic development, community leadership and workforce development partners across the West Texas region. The consortium's business members provide financial support to staff an executive advisory board, run the consortium's committees and execute agreed-upon activities. Workforce Solutions of West Central Texas also serves as the fiscal agent and grant administrator.

Industry-Led Career Pathway

One of the first workforce challenges the consortium addressed was a shortage of skilled welders across the industry. Companies reported they were having difficulty not only recruiting and retaining skilled welders, but also working with colleges across the region to train and hire new skilled welders.

Through the consortium, these businesses were able to identify their specific skill needs and invite representatives from all eight community colleges in the region to work with them to address the challenge on a regional level. Together, they created a common course sequence for earning a one-year welding certificate that is aligned with industry demand for the American Welding Society's certification and is fully transferable to all colleges in the region. They are also working to make those courses available at a growing number of high schools that offer dual-credit programs in welding, which provide college credits to students in high school. The consortium is now exploring how to expand the number of internship opportunities available through dual credit and are creating new scholarships for dual-credit and postsecondary programs that are aligned to industry demand.

The consortium captured all of this information and made it available through a virtual center of excellence in welding that acts as a resource hub for students, educators and industry. They are now taking this model and all of these activities from welding and creating a new Science, Technology, Engineering and Math (STEM) Center of Excellence resource center, which will serve as an online community and a one-stop resource for parents, students and educators. Businesses will also participate in the STEM Center of Excellence by providing externship opportunities for educators and internship or mentorship opportunities for students to fill that critical gap between education and real-world experience. The STEM Center of Excellence is developing a mobile app targeted primarily to middle and high school students, parents and individuals considering a career change. The app will provide basic assessment tools and career information and assist users in developing their own career map.

The consortium is also developing a mobile app targeted primarily to middle and high school students throughout the state of Texas that will meet new legislative and Texas Education Agency requirements for high school degree planning. Students in the state of Texas will be able to build their degree plan beginning in the 8th grade and select an approved endorsement with the required classes needed to meet high school graduation requirements. This mobile app will also allow students to share their degree plan with a high school counselor electronically.

In addition to creating new tools for the region, several other benefits have come from the consortium's efforts to address workforce shortages. As a result of building trust and increasing communication across the industry, several businesses are now sharing employee hours during lean economic times rather than laying off employees. They are also identifying opportunities to work with peer companies locally rather than contract with service or support firms from Dallas or other parts of the country.

They have also identified safety as a common priority requiring collaboration. Nearly every company in the consortium has safety needs and concerns, particularly in transportation where there has not been a day on the West Texas highways without a fatality. Many of those accidents involve industry vehicles, either transport trucks or tankers, or crews going to and from job sites. In response to this challenge, the consortium worked with companies such as Chevron, Shell, Apache, Concho Resources and Pioneer Natural Resources to create the Permian Road Safety Coalition, which has set a number of strategic objectives and launched a Goal Zero campaign to have a day with zero accidents on the road.⁴³

Dallas-Fort Worth

In the Dallas-Fort Worth region, the local workforce boards, chambers of commerce, industry leaders and the University of North Texas are collaborating as the [Regional Workforce Leadership Council](#) (RWLC) to support five of the region's industry clusters: aerospace, health care, infrastructure, logistics and technology.⁴⁴ As part of that support, the council has appointed an industry liaison for each industry cluster to help the regional workforce development system develop a strong talent pipeline into these industries. What follows are examples from three of these liaisons on how they and their organizations serve local industry.

Background

Schools, community colleges, universities and other educators often invite employers to join their advisory boards. Employers report receiving numerous calls from these entities for the same information, and workforce boards and chambers of commerce can help them save time by convening them with their industry peers, facilitating a conversation about their common challenges and sharing this information with educators, economic development organizations and other workforce boards and chambers of commerce.

Industry liaisons have observed that as the labor market tightens, employers tend to show more interest in addressing their labor challenges through a partnership. This is good news for regional workforce development systems because they need businesses to collaborate with peers in regional sector partnerships to help develop and sustain robust career pathways.

“Workforce boards are excellent agents for bringing together industry in a noncompetitive environment. DFW Regional Workforce Leadership Council (RWLC) continues to reinforce the convening of like-minded employers to expand the talent pipeline for all.”

Laurie Bouillion Larrea
President, Workforce Solutions Greater Dallas

Aerospace Industry Liaison (at Workforce Solutions for Tarrant County)

The DFW Regional Aerospace Consortium was formed in 2003 as a result of both a targeted analysis of industry trends and an employer-driven collaboration to address the issues of an aging workforce and the lack of youth migrating to careers in science and math. The consortium represents an industry that employs over 185,000 jobs in the North Texas region and includes companies such as Lockheed Martin, Bell Helicopter, Airbus Helicopters, Elbit Systems of America and Triumph Aerostructures.

Workforce Solutions for Tarrant County has dedicated an aerospace industry liaison to facilitate the operations of the regional consortium along with a grant manager for aerospace training grants. This sector partnership is charged with meeting the education and workforce needs of the aerospace industry and advises educators on curriculum so their graduates are job-ready. Often the liaison funnels this information through the Career and Technology Education Director’s Advisory Committee that consists of 17 directors from the local independent school districts. Career and technology directors regularly interact with counselors, teachers and students. They share the workforce board and sector partnership’s training products with educators, who can change their curriculum to meet industry’s needs.

The consortium has created two aerospace worker training programs administered by Tarrant County College and the Community Learning Center. In addition, it is currently working to develop an analysis of workforce supply and demand in the aerospace and aviation industry to produce recommendations on building a more robust talent pipeline that meets business needs in the region. This information will allow for a targeted curricula review and upgrade for secondary educational STEM and Career and Technology programs.

FLYBY DFW

Another product of the DFW Regional Aerospace Consortium is “FLYBY DFW,” a free aerospace gaming application. Education partners suggested that the consortium explore digital applications to more easily reach the current generation of students. FLYBY DFW allows students of all ages to have fun playing a game while also learning about career opportunities in the aerospace and aviation fields.

Industry leaders and their suppliers donated trivia questions that are built into the game and paid for software development. Career and technology directors brought the workforce board and their game designer into schools to beta test the gaming app with their students. The partnership rolled out FLYBY DFW at the Bell Helicopter Fort Worth Alliance Air Show, and industry leaders and their suppliers are using FLYBY’s marketing materials to increase young adults’ attraction to the aerospace industry.

Technology Industry Liaison (at Dallas-Fort Worth Technology and Education Council)

The U.S. has had, and continues to have, a severe shortage of engineers. It is estimated that every year approximately 70,000 engineers graduate from college programs but they fill fewer than half of the newly created engineering and computer science jobs. Almost 15 years ago, Texas Instruments, DRS Infrared, Micron, TriQuint Semiconductor, ST Micro, National Semiconductor and Raytheon started to collaborate to more effectively address these talent shortages. The technology industry liaison convenes

the partnership and its board recruits industry peers and suppliers to the partnership. Its main selling point is that businesses can accomplish more collectively than individually, each partner gets credit for all of the partnerships' successes and the partnership demonstrates good corporate citizenship.

There are several ways that the industry liaison connects industry to the workforce development system. For example, the partnership has a speakers bureau of 90 engineers (each company has five to seven engineers on the bureau). Sector partners benefit from this bureau because they can dedicate less time to reach more students and job seekers than if they were conducting outreach alone. In addition, Educate Texas participates in this partnership and is designing [Texas-STEM \("T-STEM"\) Academies](#), which are "demonstration schools and learning labs [that] develop innovative methods to improve science and math instruction."⁴⁵ Technology industry partners advise Educate Texas on how to design these schools and labs, which serve over 40,000 students in Texas.

The industry liaison connects industry partners to meetings, conferences and other events hosted by the regional workforce boards and chambers of commerce so that they can network with similar companies and discuss opportunities to collaborate to meet common challenges. The liaison also helped popularize [FIRST LEGO League Junior competitions](#) for children in kindergarten through fourth grades.⁴⁶ Three years ago, there were only four "Junior FIRST LEGO League" teams competing in North Texas. Currently, the region has 72 teams, and 180 teams are registered for the 2016-17 season.

The sector partnership used to have the traditional membership model of asking partners to contribute annually. This model has evolved into having "sustaining partners" and sponsors who write extra checks for specific programs. This structure has enabled industry to increase its exposure to educators, students and job seekers. It also gives industry partners more choices of how to participate—such as by serving on the planning committee or recruiting staff to volunteer at events. The technology sector partnership's model differs from the other RWLC sector partnerships in another way. In its first year, its budget was \$125,000. Within three years, its budget grew to \$1.2 million. Two years ago, to accommodate its growing budget and diversifying funding sources, it created its own 501c3—a nonprofit organization. Representing this nonprofit, the industry liaison organizes college and career expos, attracts industry's financial support of these expos and reaches out to organizations like Girl Scouts to increase student participation.

Logistics Industry Liaison (at Workforce Solutions for North Central Texas)

The logistics industry liaison's focus is to help industry partners address high-demand, hard-to-fill occupations. When the partners identified the need to develop an industry certificate program, the liaison facilitated their collective work. He convened a broad sample of the logistics industry with local and national employers, got support from the governor's office and local chambers of commerce, raised funds to support this effort, gathered curriculum data and brought in industrial psychologists to help build the curriculum. The partnership launched the certificate program in 2009 and reconvenes to review the curriculum at least every two years to make sure that it is up to date.

The industry liaison highlights how his business model differs from other industry liaisons. Workforce boards are required to use contractors to provide direct services and typically they contract out their outreach efforts. Workforce Solutions for North Central Texas decided to hire its own outreach staff, who live and work in the communities that they serve. Their role is to interact on a daily basis with business and economic development organizations. They then work with the contractor and others who provide direct services, such as community colleges, to ensure high-quality, responsive customer service to local and incoming businesses.

The board also hired two staff members who have expertise in corporate recruiting so that they successfully recruit high-quality talent for these businesses and teach other staff members how to do so. The industry liaison cites one major example of its success: It consistently wins the highest, or one of the highest, percent of funds from the [Texas Workforce Commission \(TWC\)'s Skills Development Fund](#).⁴⁷ Through this fund, TWC allocates \$24 million a year to local community and technical colleges and requires local workforce boards to review and participate in the development of the grant projects. “This award is a big deal,” says Kent Andersen, business development manager at Workforce Solutions for North Central Texas, because “the more training funds brought into the region, the more local workers can get trained. The better trained they are, the more likely local employers will stay in our region, become more productive and hire more people. Employer growth and wage increases benefit our economy and community.”



SECTION FIVE

The Path Forward: A State’s Role in Supporting Regional Efforts

Three state-level entities—Texas Education Agency (TEA), Texas Higher Education Coordinating Board (THECB) and Texas Workforce Commission (TWC)—play an important role in supporting regional efforts to move Texans into higher-paying jobs and ensure businesses have the skilled workforce needed to grow the economy and be as competitive as possible. However, regional coordination between businesses, schools, colleges, universities and community organizations cannot be mandated at the state level. A set of state regulations or mandates cannot create the collaborative culture required for local leaders to work across the education and workforce systems to identify their common challenges and opportunities for increased alignment. So while this work must be driven at the local level, the state has a role to play: to offer strategic guidance and provide the resources local partners need to build or strengthen regional talent pipelines that make the most sense for their community.

Texas has taken many pioneering steps to support regional workforce alignment efforts. These efforts date back to at least 1995 when TWC was created and began to prioritize industry sectors and key growth occupations for training.⁴⁸ This focus was reinforced in 2005 when then-Governor Rick Perry launched the Texas Industry Cluster Initiative. The initiative sought to develop a skilled regional workforce and competitive education system through the identification of six target industry clusters for the state.⁴⁹ To varying degrees, several workforce boards across the state can still trace their industry cluster analysis efforts back to this statewide initiative.

Under the leadership of Governor Greg Abbott, Texas is again placing a high priority on increasing education and workforce alignment in Texas. In March 2016, the governor established the Tri-Agency Workforce Initiative.⁵⁰ Commissioners from TEA, THECB and TWC were charged with assessing local economic activity, examining workforce challenges and opportunities, and considering innovative approaches to meeting the state’s workforce goals. After a series of regional stakeholder meetings across the state, the Tri-Agency initiative held a statewide convening in Austin in September 2016, and at the time of publication was working on a new report on education and workforce integration for the state.⁵¹

Other state agencies also play an important role in overseeing the development and alignment of the Texas workforce system. Beyond the three agencies included in the governor’s Tri-Agency initiative, the Texas Health and Human Services Commission, the Texas Department of Criminal Justice, the Texas Juvenile Justice Department and the Texas Veterans Commission also deliver programs and services that serve the Texas workforce system.

Each agency has a strategic plan with goals or objectives to improve the Texas workforce system. In addition, the Texas Workforce Investment Council (TWIC), which resides in the governor’s office and serves as the state workforce investment board under the federal Workforce Innovation and Opportunity Act (WIOA), is also required by Texas statute to develop a single strategic plan for the state workforce system. Nearly all of these strategic plans single out cross-agency coordination and alignment as goals or objectives, and each emphasizes the importance of eliminating redundancies or unnecessary overlap in function. However, more can be done to further integrate these efforts into a single workforce development vision for the state that is marketed to the general public and used to increase the development of world-class regional talent pipelines in Texas.

The recommendations in Box 4 are meant to complement the Tri-Agency initiative’s recommendations and provide additional opportunities to apply promising practices and lessons learned from other states and local Texas examples.

While each of the following recommendations can be implemented without appropriating new state funds, the long-term success of many of these goals and opportunities may require strategic and targeted investments by the state over time.

Box 4

Recommendations for State-Level Entities

The Vision: A World-Class Texas Talent Pipeline

- Recommendation 1:** Make the Development of Sector Partnerships and Regional Talent Pipelines a Strategic Priority for the State of Texas
- Recommendation 2:** Elevate and Expand the 60x30TX Strategic Plan for Higher Education to Become Both the Education and Workforce Development Vision for the State
- Recommendation 3:** Increase State Agency Alignment and Improve Efficiencies by Increasing Cross-Agency Staffing

The Data: The Texas Talent Pipeline Report

- Recommendation 4:** Formalize a Process for Identifying Key Policy Questions Concerning the Texas Talent Pipeline
- Recommendation 5:** Produce a Biennial Texas Talent Pipeline Report
- Recommendation 6:** Improve the Information Currently Collected Through Unemployment Insurance Wage Record Data

The Blueprint: State Technical Support and Resources

- Recommendation 7:** Identify State-Level Criteria for Designating High-Quality Career Pathways and Sector Partnerships
- Recommendation 8:** Increase State Support of Programs that Advance Regional Talent Pipelines
- Recommendation 9:** Provide Technical Assistance Resources to Local Partners on Building or Expanding Career Pathways and Sector Partnerships

The Vision: A World-Class Texas Talent Pipeline

Recommendation No. 1

Make the Development of Sector Partnerships and Regional Talent Pipelines a Strategic Priority for the State of Texas

There is an opportunity for state policymakers—whether it is the governor, the legislature or the commissioners of several state agencies working together—to advance a statewide policy to draw business, education and training stakeholders together to build world-class talent pipelines across the state. The practice of identifying regional industry clusters is well established across workforce investment boards and economic development entities. However, those clusters are not always well connected to efforts by education and training partners to build industry-led career pathways that provide the talent that Texas businesses need to thrive and compete in a global economy. The result is that too many of the career pathway initiatives and programs in Texas are not sufficiently driven by industry demand. The missing element is a statewide strategy to support the creation of sector partnerships across the state. More than half of U.S. states already support the development of sector strategies at the local level.⁵² And though creating sector partnerships is a required activity in WIOA, Texas does not yet have an official statewide strategy.

Examples of state action:

- Develop a set of cross-agency strategies to advance sector partnerships as the primary strategy for proactively engaging industry in education and training programs across the state.
- Create new incentives in state grant funding that prioritizes any awards for workforce training—such as the Skills Development Fund and Jobs and Education for Texans (JET) program—to regional initiatives that follow a sector partnership model.⁵³
- Review potential state incentives and regulatory obstacles or opportunities that can be used to encourage the creation of sector partnerships at the regional level, as well as to affect businesses' desire and ability to engage in these efforts and grow their participation, (e.g., addressing liability concerns on the part of some businesses for allowing high school students to tour or work on the job site).

Recommendation No. 2

Elevate and Expand the 60x30TX Strategic Plan for Higher Education to Become Both the Education and Workforce Development Vision for the State

The strategic plan for higher education provides an excellent vehicle for raising awareness of the need to increase the educational attainment level of Texas' workforce. The overarching goal for the 60x30TX plan is for 60 percent of Texans ages 25–34 to earn a postsecondary certificate or degree by 2030.⁵⁴ However, to ensure that these credentials have value in a labor market that is changing due to advances in technology and increasing globalization, the plan, strategies and initiatives must be able to adapt quickly.

With education and workforce development linked directly in the vision, it underscores that the plan must go beyond educational attainment to ensure that Texas develops the talent needed to maintain its economic competitiveness and increase prosperity across the state.

Examples of state action:

- Elevate and specify the role of business, and in particular of sector partnerships, in helping institutions of higher education validate the labor market value of skills and credentials as it pertains to the marketable skills goal in the 60x30TX strategic plan.
- Remove the restriction that limits the 60x30TX goal to 25–34 year-olds and expand it to include all adults in their prime working years, 25–54 years old. This would not only broaden the plan's

emphasis to more of the Texas workforce, but it would also deepen the connection to state agencies and institutions educating, training and placing adult populations into jobs.

- Encourage all state agencies with education or training programs to develop or expand on their own benchmarks that are responsive to the 60x30TX vision, as well as cross-reference their strategic plans, objectives and strategies with the 60x30TX goals. This would increase cross-agency coordination and ensure that all state entities are fully invested in and accountable for the success of the plan.
- Create a plan for implementing job placement targets in the marketable skills goal of the 60x30TX vision, which aims to ensure that all graduates complete postsecondary programs with identified marketable skills. These targets could be proposed and set by each respective agency and program, provided they are also reported publicly.
- Create an overarching document that summarizes all cross-agency initiatives and objectives that advance the 60x30TX vision, and report annually on progress toward attaining that vision.

Recommendation No. 3

Increase State Agency Alignment and Improve Efficiencies by Increasing Cross-Agency Staffing

Workforce alignment and collaboration must be modeled at the state level. Beyond collaborating on strategic planning efforts, state agencies in Texas have modeled effective collaboration by partnering on several joint initiatives, most prominently the Tri-Agency initiative. There are several options to increase state agencies' coordination to accomplish the goals and objectives of the Tri-Agency initiative.

Examples of state action:

- Create joint staffing positions that report to the commissioners in multiple agencies.
- Increase the number of cross-agency initiatives that produce services or products used by partners at the regional level. Examples may include the Texas Talent Pipeline report discussed below, or programs such as Accelerate Texas, which is a joint effort by TWC and THECB to assist individuals receiving adult education services to enroll in community college courses that lead to a credential and employment.
- Create one or more interagency councils or leadership committees—underneath the leadership and authority of the Tri-Agency initiative or other cross-agency body such as TWIC—that are responsible for a particular cross-agency initiative or set of strategies for aligning education and workforce development efforts across state agencies. One example could be the cross-agency creation of an annual 60x30TX report on key initiatives and progress to date. Each council or committee should have designated staff support and a clear set of deliverables and be required to publicly report on its activities and outcomes.

The Data: The Texas Talent Pipeline Report

Texas state agencies provide a considerable amount of information on the Texas labor market and the education and training system. While these data systems are robust, there is need for a coordinated effort to further prioritize and elevate the most critical and actionable data from this abundance of information, as well as to develop protocols to look at data across isolated or segmented programs and data sets within the system. This requires a process for identifying the most important policy questions that can elevate major challenges or gaps in Texas' regional labor markets and a single report or summary data source that puts that information in front of state policymakers to address these challenges.

Recommendation No. 4

Formalize a Process for Identifying Key Policy Questions Concerning the Texas Talent Pipeline

Texas currently does not have a formal process for identifying key policy questions to guide the allocation of limited resources and investments. This is a particular challenge for the workforce system where no one agency can be tasked with oversight of all of Texas' education, workforce and economic development programs and services. Without clearly articulated policy questions to focus data-driven state efforts and legislative action, policymakers run the risk of debating and enacting policies that fail to address the most significant challenges facing the state and local areas.

Examples of state action:

- Form an interagency council or leadership committee under the leadership of the Tri-Agency initiative to develop a list of prioritized policy questions to help guide agency strategic planning, budgeting and reporting regarding education and workforce systems.
- Update the list of policy questions on a biennial basis to help inform and advise legislators prior to each legislative session.

Recommendation No. 5

Produce a Biennial Texas Talent Pipeline Report

Beyond prioritizing policy questions, the state also needs a method of providing state and local policymakers with answers to those questions. THECB produces an excellent example and model in the Public Higher Education Almanac. Created in 2011, the almanac is designed to provide an annual status update on the state's higher education plan, as well as promote greater transparency and accountability within the system. The state of Texas should consider producing a similar report for the workforce system—or adding a new section to the existing almanac—that provides answers to the talent pipeline policy questions and provides critical data for the state and each economic region.

Examples of state action:

- Produce a biennial Texas Talent Pipeline Report that is available before each legislative session with data for the state and each economic region on high-wage and high-demand jobs (“hot jobs”), the largest or most significant skill gaps threatening regional talent pipelines, economic growth projections for industry clusters in each region and a list of priority industry certifications that might be integrated into college courses, career and technical education courses, and dual-credit programs that offer college credit for courses taken by high school students.
- Provide a summary of the regional skill gap analyses conducted by the state's 28 local workforce boards, and identify for state policymakers where significant skills gaps exist across the state.
- Highlight leading examples and promising practices from across the state in the report to serve as models for how Texas is addressing challenges and leading the development of new talent pipelines.
- Ensure that a cross-agency team under the leadership of the Tri-Agency initiative comes together to produce the biennial Texas Talent Pipeline Report, leverages local analysis wherever possible, is responsive to the state's talent pipeline vision and integrates efforts that each agency is taking to advance that vision.

Recommendation No. 6

Improve the Information Currently Collected Through Unemployment Insurance Wage Record Data

There are a few technical changes or adjustments that could significantly improve the quality of education and workforce data available to state agencies and local partners. For example, the unemployment insurance (UI) system is the primary tool used by state agencies to match employment and wage information with student record data to determine the effectiveness of education and training programs. Currently the state's system does not require employers to provide occupation information, which significantly limits the usefulness of this data. For example, the state's data systems can determine if nursing students are employed after graduating and how much these students are making on a quarterly basis. However, the system is not able to determine if the students got jobs as nurses using the education that they completed. Similarly, the address information collected through the UI system can be unreliable and cannot be used to effectively determine if graduates from a college or local training provider were able to find employment within the regional labor market.

Examples of state action:

- Explore the costs and benefits to businesses and job seekers of reporting employee occupations on unemployment insurance forms. This could also include determining if human resources staffing agencies, which complete a significant amount of UI reporting on behalf of employers, can make this change more efficiently or inexpensively than individual employers.
- Explore the costs and benefits to businesses and job seekers of improving the accuracy of the work address reported for employees through the unemployment insurance form.

The Blueprint: State Technical Support and Resources

State agencies provide a significant amount of technical support to local education and workforce partners. For example, TWC provides a menu of resources, including helping local partners identify industry clusters in their region, conducting outreach and training on labor market information and providing access to several tools and resources, including third-party data tools such as Help-Wanted Online's real-time labor market information. Similarly, TWIC provides a series of documents and tools designed to assist workforce alignment efforts at the local level, including its most recent effort to identify a priority list of industry-recognized certifications for the state that can be used by schools, colleges and training programs.

Recommendation No. 7

Identify State-Level Criteria for Designating High-Quality Career Pathways and Sector Partnerships

There are more than 60 pathway programs operating in Texas across K-12, higher education and workforce development.⁵⁵ There are also an unknown number of regional sector partnerships and other business-driven education initiatives working to guide the development of some of those pathway programs. To take these efforts to scale and ensure that they are working toward a coherent system, the state should identify the quality elements of a regional talent pipeline in Texas and create a credentialing process to acknowledge excellence for both students and for employers, similar to early college high school credentialing. But to maximize local flexibility in designing initiatives that meet the needs of their communities, local partners must recognize the need to customize these strategies to fit the unique needs of their regions.

Examples of state action:

- Create a formal cross-agency review process under the leadership of the Tri-Agency initiative to identify common career pathway elements shared across state programs, and create a blueprint for building pathways that are successful at moving various students through a series of education and training courses and into a related job with career advancement potential.
- Create a similar review process to identify common sector partnership elements shared across regional partnerships, and create a blueprint for creating industry-led partnerships.

Recommendation No. 8**Increase State Support of Programs that Advance Regional Talent Pipelines**

There are several ways the state can make new investments—or strengthen the impact of investments already made—to advance regional talent pipelines. One of the greatest opportunities is to strengthen efforts or initiatives that incentivize collaboration among education and business partners.

Examples of state action:

- Increase the impact of TWC's Skills Development Fund by requiring an industry match to receive a workforce training grant, extending the reach of state funds and ensuring that businesses are committed to the need for and success of their grant.
- Set aside a portion of the Skills Development Fund, Carl D. Perkins Career and Technical Education funds, the governor's discretionary funds provided through the Workforce Innovation and Opportunity Act or the newly announced Texas Industry Partnership program for sector partnerships that engage more than one business partner in an effort to build an industry-led career pathway.
- Add job placement criteria to the performance funding model for community colleges.
- Increase the percent of WIOA clients who receive workforce training services.
- Seek opportunities to increase federal support of career pathway programs, such as using Temporary Assistance for Needy Families funds to support adult career pathway programs at community colleges or otherwise incentivize using these funds to support education and training that leads to employment.
- Increase the share of state funding for education and training programs that go to state-designated career pathway programs. This could include increasing formula funding for the K-12 or higher education system for programs of study at the secondary or postsecondary level. Funds may also be shifted to efforts such as the Accelerate Texas program that integrate both basic skills instruction and workforce training for adults.⁵⁶

Recommendation No. 9

Provide Technical Assistance Resources to Local Partners on Building or Expanding Career Pathways and Sector Partnerships

In addition to creating a state designation process for recognizing high-quality career pathways and sector partnerships, the state should offer technical assistance resources and services from nationally or state-recognized sources to local partners. And because requests for assistance can come from local workforce boards, independent school districts, institutions of higher education and economic development entities, the technical assistance services offered should cut across education, workforce and economic development.

Examples of state action:

- Make available technical assistance services from one or more state-recognized sources to provide expert guidance to local stakeholders on how to build career pathway programs, create sector partnerships or conduct industry cluster analysis. This could be accomplished by publishing a list of experts or organizations that are familiar with state designation criteria, as well as by setting aside a small technical assistance fund that could be used to provide local assistance upon request.
- Design a series of state agency guidance and planning documents—a Texas Talent Pipeline toolkit—that draws on varied promising practices from across the state and country on implementing industry cluster analysis, sector partnerships and career pathways.

Acknowledgments

Our appreciation goes to all 28 workforce boards of Texas that took the time to complete our survey.

Our appreciation also goes to the following reviewers and contributors for sharing their insights and expertise:

Donald Bowers, Federal Reserve Bank of Dallas, Houston Branch
Roberto Coronado, Federal Reserve Bank of Dallas, El Paso Branch
Roy C. Lopez, Federal Reserve Bank of Dallas
Lupe Mares, Federal Reserve Bank of Dallas, El Paso Branch
Pia Orrenius, Federal Reserve Bank of Dallas
Emily Ryder Perlmeter, Federal Reserve Bank of Dallas

Local Experts

Kent Andersen, Workforce Solutions for North Central Texas
Tamara Atkinson, Workforce Solutions Capital Area*
Peter Beard, Greater Houston Partnership
Mike Buck, Workforce Solutions of Concho Valley
Elizabeth Caudill, Dallas Regional Chamber
Linda Davis, Workforce Solutions Greater Dallas
Angela Farley, Dallas Regional Chamber
Laurie Bouillion Larrea, Workforce Solutions Greater Dallas
Loh-Sze Leung, Leung Consulting
Judy McDonald, Workforce Solutions for Tarrant County
Jann Miles, Workforce Solutions for Tarrant County
Renee Parker, Workforce Solutions for Tarrant County
Mary Ross, Workforce Solutions of West Central Texas
David Setzer, Workforce Solutions for North Central Texas
John Shellene, Dallas Fort Worth Technology and Education Council
Katherine Stokes, West Texas Energy Consortium
Willie Taylor, Workforce Solutions of Permian Basin
Mike Temple, Workforce Solutions Gulf Coast

State Experts

Wende Burton, Communities Foundation of Texas**
Kelty Garbee, Educate Texas**
David Gardner, Texas Higher Education Coordinating Board
Christopher King, University of Texas at Austin Ray Marshall Center
Heath Prince, University of Texas at Austin Ray Marshall Center
Quentin Suffren, College, Career & Military Preparation, Texas Education Agency
Greg Vaughn, Texas Association of Workforce Boards

National Experts

Taryn MacFarlane, Corporation for a Skilled Workforce
Brent Parton, Employment and Training Administration, U.S. Department of Labor
Deborah Povich, Working Poor Families Project**
Brandon Roberts, Working Poor Families Project**
Eric Seleznow, Employment and Training Administration, U.S. Department of Labor
Martin Simon, National Governors Association
Lindsey Woolsey, Woolsey Associates

*Workforce Solutions Capital Area has contracted for services with the Center for Public Policy Priorities.

**Disclaimer: These organizations have been a financial supporter of the Center for Public Policy Priorities.

Notes

¹"The Vanishing Middle: Job Polarization and Workers' Response to the Decline in Middle-Skill Jobs," by Didem Tüzemen and Jonathan L. Willis, Federal Reserve Bank of Kansas City, *Economic Review*, First Quarter 2013, www.kansascityfed.org/publicat/econrev/pdf/13q1tuzemen-willis.pdf.

²For more information, see Figure 3: Index of Changing Work Tasks in the U.S. Economy 1960–2009, "Dancing with Robots: Human Skills for Computerized Work," by Frank Levy and Richard Murnane, *Third Way*, July 17, 2013, www.thirdway.org/report/dancing-with-robots-human-skills-for-computerized-work.

³For additional information, see "Texas Leads Nation in Creation of Jobs at All Pay Levels," by Melissa LoPalo and Pia M. Orrenius, Federal Reserve Bank of Dallas *Southwest Economy*, First Quarter 2014, www.dallasfed.org/research/swe.aspx, and "Middle-Skill Jobs Lost in U.S. Labor Market Polarization," by Anton Cheremukhin, Federal Reserve Bank of Dallas *Economic Letter*, Vol. 9, No. 5, May 2014, www.dallasfed.org/research/eclett.aspx#tab4.

⁴"America's Divided Recovery: College Haves and Have-Nots," by Anthony P. Carnevale, Tamara Jayasundera and Artem Gulish, Center on Education and the Workforce, McCourt School of Public Policy, Georgetown University, 2016, <https://cew.georgetown.edu/cew-reports/americas-divided-recovery/#full-report>.

⁵"America's Forgotten Middle-Skill Jobs: Education and Training Requirements in the Next Decade and Beyond," by Harry J. Holzer and Robert I. Lerman, The Workforce Alliance, November 2007, www.urban.org/sites/default/files/alfresco/publication-pdfs/411633-America-s-Forgotten-Middle-Skill-Jobs.PDF.

⁶See note 2 and "Computing Inequality: Have Computers Changed the Labor Market?" by David H. Autor, Lawrence F. Katz and Alan B. Krueger, *Quarterly Journal of Economics* vol. 113, no. 4, 1998, pp. 1169–1213.

⁷"Skill Gaps, Skill Shortages and Skill Mismatches: Evidence for the U.S.," by Peter Capelli, National Bureau of Economic Research Working Paper 20382, August 2014, www.nber.org/papers/w20382.

⁸See note 7.

⁹"Workforce Intermediaries for the Twenty-First Century," by Robert P. Giloth, The American Assembly and Columbia University, www.temple.edu/tempress/titles/1723_reg_print.html.

¹⁰"State Sector Strategies Coming of Age: Implications for State Workforce Policymakers," by Lindsey Woolsey and Garrett Groves, Corporation for a Skilled Workforce, National Skills Coalition and the National Governors Association Center for Best Practices, Jan. 16, 2013, www.nga.org/cms/home/nga-center-for-best-practices/center-publications/page-ehsw-publications/col2-content/main-content-list/state-sector-strategies-coming-o.html.

¹¹These definitions come from a workforce development vantage point, highlighting the entities' primary function within the workforce development system. These definitions are not comprehensive, and entities may not prioritize their stated workforce development function or include it in their mission (e.g., community colleges and universities might define their mission as educating well-rounded citizens).

¹²For more information, go to "U.S. Cluster Mapping: Mapping a Nation of Regional Clusters," by Michael Porter, Institute for Strategy & Competitiveness, Harvard Business School and U.S. Department of Commerce, Economic Development Administration, www.clustermapping.us/.

¹³"At the Heart of Texas: Cities' Industry Clusters Drive Growth," by Laila Assanie, Kristin E. Davis, Pia M. Orrenius and Michael Weiss, Federal Reserve Bank of Dallas, February 2016, <https://dallasfed.org/en/research/heart.aspx>.

¹⁴See note 13.

¹⁵"Houston: Energy Powerhouse," Energy Data Sheet, Greater Houston Partnership, April 2013, www.houston.org/assets/pdf/opportunity/Energy-Data-Sheet.pdf.

¹⁶"What Are Clusters?" Institute for Strategy & Competitiveness, Harvard Business School, Harvard University, www.isc.hbs.edu/competitiveness-economic-development/frameworks-and-key-concepts/Pages/clusters.aspx.

¹⁷"Moving Sectoral and Career Pathway Programs from Promise to Scale," by Christopher T. King and Heath J. Price in *Transforming U.S. Workforce Development Policies for the 21st Century*, Carl Van Horn, Tammy Edwards and Todd Green, eds., Kalamazoo, Mich.: W.E. Upjohn Institute for Employment Research, 2015, pp. 195–229.

¹⁸"Texas Industry Cluster Initiative," Texas Workforce Commission, www.twc.state.tx.us/partners/texas-industry-cluster-initiative.

¹⁹"Tuning in to Local Labor Markets: Findings from the Sectoral Employment Study," by Shelia Maguire, Joshua Freely, Carol Clymer, Maureen Conway and Deena Schwartz, Public/Private Ventures, July 2010, ppv.issuelab.org/resources/5101/5101.pdf.

²⁰See note 10.

²¹Results from "Promising Practices in Workforce Development in Texas," the 2016 survey sent to Texas' workforce development boards by the Federal Reserve Bank of Dallas and the Center for Public Policy Priorities in partnership with the Texas Association of Workforce Boards.

²²"Workforce Development—Sector Partnerships," Assets & Opportunity Scorecard, CFED, scorecard.assetsandopportunity.org/latest/measure/workforce-development-sector-partnerships.

²³"Sector Snapshot: A Profile of Sector Initiatives, 2010," by Ravi Mangat, National Network of Sector Partners, ww1.insightcced.org/uploads/publications/wd/Sector-Snapshots.pdf.

²⁴See note 10.

²⁵"Guided Pathways to Success: Boosting College Completion," Complete College America, completecollege.org/docs/GPS_Summary_FINAL.pdf.

- ²⁶"Resources," American Association of Community Colleges, www.aacc.nche.edu/Resources/aaccprograms/pathways/Pages/default.aspx.
- ²⁷Joint Federal Agency Memo on Career Pathways, April 28, 2016, www.ncpn.info/2016-downloads/CP-JointLetterFinal-4-22-2016.pdf.
- ²⁸"Shared Vision, Strong Systems," Alliance for Quality Career Pathways, a project of CLASP, Framework Version 1.0, June 2014, www.clasp.org/resources-and-publications/files/aqcp-framework-version-1-0/AQCP-Framework.pdf.
- ²⁹Building Career Pathways to Help More Students Succeed, Jobs for the Future, www.iff.org/initiatives/pathways-prosperity-network.
- ³⁰For details, see "Texas Success Center Resources," Texas Association of Community Colleges, www.tacc.org/pages/texas-success-center/resources/texas-success-center-resources; Texas Regional Stem Degree Accelerator, Educate Texas, www.edtx.org/postsecondary-access-and-success/postsecondary-success/texas-regional-stem-degree-accelerator/ and 60x30TX, Texas Higher Education Coordinating Board, www.thecb.state.tx.us/index.cfm?objectid=5033056A-A8AF-0900-DE0514355F026A7F.
- ³¹See note 10.
- ³²"The New Shape of Texas High School Education: Administrator, Counselor, and Parent Viewpoints on HB5 Endorsement Implementation," Jenny Knowles Morrison, et al, Texas Education Grantmakers Advocacy Consortium and The Bush School of Government & Public Service, Texas A&M University, http://bush.tamu.edu/psaa/capstones/TEGAC%20HB5%20Report_Final.pdf and "Successful Implementation of HB 5: Recommendations for Stakeholder Groups," Texas Education Grantmakers Advocacy Consortium, tegac.org/uploads/HB5-Successful-Implementation-FINAL.pdf
- ³³"Governor Abbott Announces Initiative to Establish Innovative Academies in Texas High Schools," Office of the Governor of Greg Abbott, Sept. 2, 2016, gov.texas.gov/news/press-release/22629.
- ³⁴ For more information, see "Beyond the Campus: Connecting Community College Students to Meaningful Employment," by Chandra Kring Villanueva, Center for Public Policy Priorities, March 2015, forabettertexas.org/images/EO_2015_03_WorkStudy.pdf.
- ³⁵"Identifying Opportunity Occupations in the Nation's Largest Metropolitan Economies," by Keith Wardrip, Kyle Fee, Lisa Nelson and Stuart Andreason, Federal Reserve Banks of Philadelphia, Cleveland and Atlanta, Sept. 9, 2015, www.clevelandfed.org/newsroom-and-events/publications/special-reports/sr-20150909-identifying-opportunity-occupations.aspx.
- ³⁶See note 21.
- ³⁷For a more detailed explanation of what workforce development board do, see "Engaging Workforce Development: A Framework for Meeting CRA Obligations," by Elizabeth Sobel Blum and Steven Shepelwich, Federal Reserve Bank of Dallas and Federal Reserve Bank of Kansas City, December 2016.
- ³⁸For more information about collective impact, see the Collective Impact Forum, an initiative of FSG and the Aspen Institute Forum for Community Solutions, collectiveimpactforum.org/what-collective-impact.
- ³⁹See note 13.
- ⁴⁰See note 15.
- ⁴¹For more information, see East Harris County Manufacturers Association, www.ehcma.com.
- ⁴²For more information, see West Texas Energy Consortium, www.wtxec.org.
- ⁴³For more information, see Permian Road Safety Coalition: Working Together for Safer Roads, www.permianroadsafety.org.
- ⁴⁴For more information, see "Annual Report 2015," Regional Workforce Leadership Council, workforcesolutions.net/wp-content/uploads/2016/01/2015-RWLC-FINAL-Hi-Res.pdf.
- ⁴⁵For more information, see the Texas Science, Technology, Engineering and Mathematics (T-STEM), Educate Texas, www.edtx.org/college-ready-standards-and-practices/t-stem/.
- ⁴⁶For more information, see FIRST LEGO League Jr. Challenge & Season Info, www.firstinspires.org/robotics/flljr.
- ⁴⁷For more information, see the Texas Workforce Commission's Skills Development Fund, www.twc.state.tx.us/partners/skills-development-fund.
- ⁴⁸See note 17.
- ⁴⁹See note 18.
- ⁵⁰For more information, see "Prosperity Requires Being Bold: Integrating Education and the Workforce for a Bright Texas Future," The Tri-Agency Report to the Office of the Governor from the Texas Education Agency, Texas Higher Education Coordinating Board and Texas Workforce Commission, November 2016, www.twc.state.tx.us/files/partners/tri-agency-report-office-governor-twc.pdf.
- ⁵¹"Governor Abbott Establishes Tri-Agency Workforce Initiative," Office of the Governor Greg Abbott, March 7, 2016, <http://gov.texas.gov/news/press-release/22031>.
- ⁵²See note 10.
- ⁵³For more information, see note 47 and Jobs & Education for Texans (JET) Grant Program, www.twc.state.tx.us/partners/jobs-education-texans-jet-grant-program.
- ⁵⁴"60x30TX: Texas Higher Education Strategic Plan: 2015-2030," Texas Higher Education Coordinating Board, www.thecb.state.tx.us/reports/PDF/6862.PDF?CFID=41531877&CFTOKEN=29618147.
- ⁵⁵See note 29.
- ⁵⁶For more information, see Accelerate TEXAS, Texas Higher Education Coordinating Board, www.thecb.state.tx.us/index.cfm?objectid=896FFFBE-FD7B-786E-FC7B9F8F4EC245AE.