Estimating Labor Demand and Supply in Texas: How Planning Tools and Data are Used

Final Report

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<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>AGS</td>
<td>Applied Geographic Solutions</td>
</tr>
<tr>
<td>BAT</td>
<td>Bachelor of Applied Technology</td>
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<tr>
<td>BED</td>
<td>Business Employment Dynamics</td>
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<tr>
<td>CIP</td>
<td>Classification of Instructional Program codes</td>
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<td>CTC</td>
<td>Community and Technical College</td>
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<tr>
<td>CES</td>
<td>Current Employment Statistics</td>
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<tr>
<td>DWAs</td>
<td>Detailed Work Activities</td>
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<td>EMSI</td>
<td>Economic Modeling Specialists International</td>
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<tr>
<td>GEPR</td>
<td>Gainful Employment Placement Rate</td>
</tr>
<tr>
<td>IPEDS</td>
<td>Integrated Postsecondary Education Data System</td>
</tr>
<tr>
<td>KSAs</td>
<td>Knowledge, Skills, and Abilities</td>
</tr>
<tr>
<td>LAE</td>
<td>Labor Availability Estimator</td>
</tr>
<tr>
<td>LMI</td>
<td>Labor Market Information</td>
</tr>
<tr>
<td>LMCI</td>
<td>Labor Market and Career Information</td>
</tr>
<tr>
<td>MSA</td>
<td>Metropolitan Statistical Area</td>
</tr>
<tr>
<td>NAICS</td>
<td>North American Industry Classification System</td>
</tr>
<tr>
<td>OES</td>
<td>Occupational Employment Statistics</td>
</tr>
<tr>
<td>O*NET</td>
<td>U.S. Department of Labor’s Occupational Information Network</td>
</tr>
<tr>
<td>QCEW</td>
<td>Quarterly Census of Employment and Wages</td>
</tr>
<tr>
<td>SOC</td>
<td>Standard Occupational Classification</td>
</tr>
<tr>
<td>SOCRATES</td>
<td>Standardized Occupational Components for Research and Analysis of Trends in Employment System</td>
</tr>
<tr>
<td>STI</td>
<td>State Training Inventory</td>
</tr>
<tr>
<td>RMC</td>
<td>Ray Marshall Center for the Study of Human Resources</td>
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<tr>
<td>TACTE</td>
<td>Texas Association of College Technical Educators</td>
</tr>
<tr>
<td>TAIR</td>
<td>Texas Association for Institutional Research</td>
</tr>
<tr>
<td>TEDC</td>
<td>Texas Economic Development Council</td>
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<tr>
<td>THECB</td>
<td>Texas Higher Education Coordinating Board</td>
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<tr>
<td>TRACER</td>
<td>Texas Rapid Access to Career and Economic Services</td>
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<tr>
<td>TWC</td>
<td>Texas Workforce Commission</td>
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<tr>
<td>TWIC</td>
<td>Texas Workforce Investment Council</td>
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<tr>
<td>UI</td>
<td>Unemployment Insurance</td>
</tr>
<tr>
<td>U.S. DOL</td>
<td>United States Department of Labor</td>
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<tr>
<td>WDA</td>
<td>Workforce Development Area</td>
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<tr>
<td>WDB</td>
<td>Workforce Development Board</td>
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Many workforce development experts from within Texas, nationally, and from a handful of states shared insights, experiences, processes and tools that contributed to this report. Researchers at the Ray Marshall Center express their gratitude to everyone who has contributed to this project.

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EXECUTIVE SUMMARY

BACKGROUND AND OBJECTIVES

The Evaluating Supply and Demand Tools and Methodologies project was funded by the Texas Workforce Investment Council (TWIC) and conducted by the Ray Marshall Center (RMC) for the Study of Human Resources, part of the Lyndon B. Johnson School of Public Affairs at the University of Texas at Austin. This effort grew out of concerns among key workforce development stakeholders that more could be done to accurately measure labor demand and supply within the state of Texas, in real-time, as well as over the short- and long-term. The purpose of this project was to assess the capabilities and availability of supply and demand planning tools used in Texas and other states around the country. To assess the adequacy of these tools, RMC researchers set out to determine the way in which tools and data are currently used, and what groups and individuals are using them. One major aim was to determine how well these tools effectively anticipate occupational shortages to enable community and technical colleges to plan program offerings that meet the demands for technically skilled graduates in an ever-changing Texas labor force.

This report identifies best practices within Texas and other states that may improve the efficacy of planning programs and anticipating employer needs in various fields of the labor market. In conversations with workforce development experts and tool users, and through a large-scale survey of tool users in Texas, recommendations and next steps were developed to improve the practical value of planning tools, whether by making changes to the existing tools, by connecting different tools, or by developing new tools and/or systems.

SUMMARY OF FINDINGS

Estimating Labor Supply in Texas

Several tools—Labor Availability Estimator (LAE), Applicant Availability Indicator (AAI), State Training Inventory (STI), Strategic Workforce Assessment Program (SWAP), and the Gainful Employment Placement Rates (GEPR)—are currently being used to estimate labor supply in Texas. While each tool provides some information about labor supply in Texas, a holistic view of labor supply is obtained only through the use of multiple tools.
Unfortunately, the data underlying these tools is from at least two years ago, yielding outdated estimates and making it more difficult for community and technical colleges to respond accurately to any imbalances between supply and demand. Finally, none of the available tools account for worker mobility and migration. While a large-scale labor supply survey accounting for worker mobility and migration could address this gap, the periodic cost of such an effort is difficult to justify and sustain.

**Estimating Labor Demand in Texas**

Several tools are currently being used in Texas to estimate labor demand—SOCRATES, Texas CARES, TRACER, U.S. BLS forecasts and data, and several commercial software tools. While each of these tools has strengths, none currently estimate demand at the geographic level below that of a particular Workforce Development Area (WDA). While the WDA-level of geography may work well for smaller areas, in larger WDAs both employers and job seekers may benefit greatly from more refined estimates of labor demand. However, these data are often unavailable.

In some cases, the data on labor demand for many Texas tools are outdated, requiring job seekers and education and training institutions to use other methods to better ascertain current local demand. For example, Midland College has developed a strategy that involves continuing conversations with local employers for estimating labor demand, as do many other community and technical colleges in Texas. Midland College has taken this one step further by striving to keep those employers that are most actively employing their graduates active on their Advisory Council. This best practice may be helpful to other community and technical colleges within Texas and larger urban areas. Another idea might be to develop an advisory council of employers from the largest industry employers in the area.

Midland College has also established a strategic regional partnership with Odessa College. Administrators from Midland and Odessa Colleges share information about their programs and estimated future demand and then jointly decide which institution can best serve students in these programs. In this instance, the collaboration coupled with the
existing tools provides a better estimate of labor demand given the lag-time common across many demand-planning tools.

**Findings from the Survey of Tool Users in Texas**

Results from the survey of tool users in Texas can be found on page 32 of this report. The majority of those surveyed indicated that feedback from employers (91%) and accurate data about the current job openings and labor availability (85%) were the most important factors in making education and training decisions. Three-quarters of respondents (76%) indicated that accurate short-term (1-5 years) predictions regarding job openings and labor availability were also very important. Results also indicated that long-term (5+ years) predictions were considered a significant factor (60%). Almost all users (96%) indicated that they would find it useful to have access to pre-generated supply-demand gap analysis reports by region.

Survey respondents named quality data, quality reports, and information gathered from employers as the three most important things for their organization in estimating workforce demand and supply. This finding seems to indicate that the priority should be placed on obtaining quality data and information that can be used to produce reports, but that even quality data cannot be intended to replace more up-to-date information gathered from employers. While relatively few respondents cited a quality tool as important for estimating demand and supply, it may be that users in Texas cannot imagine a tool as comprehensive and timely as the new system developed by Florida’s Department of Economic Opportunity.

Over two-thirds of respondents report they are using tools and/or data for both labor supply and labor demand purposes. The highest share of tool users (83%) in the survey use United States Bureau of Labor Statistics (BLS) forecasts and data. Despite this, a few respondents wanted BLS data to be easier to use and several noted that the data are out of date. There is a possibility that BLS’ name recognition explains some of the reportedly high usage.

Three-quarters of respondents report using one of the four Texas Workforce Commission (TWC) tools asked about in the survey. Respondents indicated that county-
level data would be useful for non-Metropolitan Statistical Area (MSA) cities. Another noted, “It is just not as thorough as EMSI Analyst.” Tool and data users are often not sophisticated statisticians. As one respondent pointed out, “As an economic developer in a small community, we do not have the data research experience or resources. When developing new tools it would be nice if they were developed with the non-data research person in mind.” This theme was echoed by a workforce development expert we interviewed who noted in an email, “Supply and demand analysis is a technical foray within the discipline of regional economic analysis that is often abused by those without appropriate background...for those without any technical or academic background or understanding, but tasked to determine, defend or promote education program investments, I’d want the tools that I use, and the outputs thereof, to be as simple as possible.”

Forty percent of respondents reported using SWAP and while few cited its benefits, such as facilitation of analysis of occupational/industry clusters, most preferred other TWC tools. A few respondents felt rural communities “have no representation” in the data. Again, outdated data was cited by SWAP users as one of the tool’s drawbacks.

Although commercial tools are used by only one-third of respondents, they are more frequently used than the other tools, which are generally used less than once a month. Given that 30% of respondents are paying between $5,000 and $15,000 annually for commercial tools, it is not surprising that these tools are being used more frequently. Economic Modeling Specialists International (EMSI) is used by the majority of respondents using a commercial tool. Respondents liked that “data can be gathered to the zip code level which helps pinpoint individual neighborhoods for services.” Another respondent noted that EMSI could have “more predictive abilities,” while others called the tool “superb” and cited “ease of use, great design, and canned reports at the click of a button.”

An essential takeaway of the survey was that nearly all respondents (96%) indicated that they would find it useful to have access to pre-generated supply/demand gap analysis reports by region. This demonstrates that Texans who rely on labor data to make business and policy decisions would like to have additional information to make the best possible decisions.
RECOMMENDATIONS

Although estimating labor supply and demand is difficult and complicated by many factors, one important point noted by at least two workforce development experts is that the majority of the labor market is functioning smoothly and easily. That is, the majority of labor supplied meets the needs of employers, while the majority of labor demands are met through incumbent workers, dislocated workers, or recent graduates. It is only at the margins of the labor market that skill shortages and skill mismatches tend to occur. However, labor supply and demand estimation related to community college programs can be essential for effective program planning. While equilibrium is the preferred state, results indicating either an oversupply or undersupply communicate the need for additional data and information that would allow community and technical college administrators to develop new programs or signal that an existing program should end.

As one workforce expert stated, successful policy decisions in these areas rely on a “tripod.” The first leg of the tripod is strong capabilities for analysis of labor supply/demand data. The second is qualitative engagement and feedback from stakeholders. The third leg of the tripod is an effective monitoring system that creates a “feedback loop” to adjust outputs to compensate for changing circumstances.

It was with that first leg in mind that Florida embarked on developing their new Occupational Supply/Demand System. Using a $1 million Workforce Data Quality Initiative (WDQI) grant from the U.S. Department of Labor (DOL), the Florida Department of Economic Opportunity (DEO) developed a detailed online labor market analysis tool (http://www.floridajobs.org/labor-market-information). Florida’s system is “designed to improve education and training alignment to better meet the needs of business” (Rust & Whitfield, 2014). Florida’s system draws upon pre-existing data sources and has three primary goals. The first goal is to create a “better alignment of education and training offerings in meeting the hiring demands of business.” The second goal is to support business recruitment. Florida’s system is highly successful because it can provide “the most comprehensive and timely occupational data to determine the available labor supply.” Finally, the third goal is to allow students to see “real time information on jobs in demand.
now and in the future; jobseekers can use the information for re-employment purposes” (Rust & Whitfield, 2014).

The in-depth interviews conducted with workforce development experts in Texas and nationally, in conjunction with the inventory of currently used tools and the survey of tool users, lead to a number of conclusions and recommendations for consideration. Other than Florida’s Occupational Supply/Demand System, Texas’ resources and approaches for predicting labor demand and supply are well ahead of most other states, according to our review of other states’ practices. Given this, Texas may want to consider a two-pronged approach to improving labor supply and demand estimates. On the one hand, workforce development experts can benefit from sharing lessons learned within Texas from one WDA to another and from one Community College to another. On the other hand, survey results indicate demand for a system to estimate labor supply and demand at the state, regional, and local level with real-time, short-term, and long-term up-to-date estimates. In conclusion, we provide recommendations for both of these two prongs.

In the course of this project, several best practices that may benefit others within Texas were identified:

- Continuous contact with employers is a critical piece in developing accurate labor supply and demand estimates. In-person or through surveys, employers have a crucial role to play in estimating skill shortages and skill mismatches. While it is common for community colleges to rely on Advisory Committees of local employers, Midland College systematically changes their Committee to keep the connection between hiring (supply) and skills needed (demand) current. This process combines quantitative and qualitative assessments to ensure that the employers consulted provide the most valuable perspectives to the College and its students.

- Information obtained from job seekers (e.g., training enrollees, graduates, employees seeking new skills) is also critical to estimating labor supply by occupation.

- Collaboration is a valuable way to allocate scarce resources efficiently across more than one community college. That is, program development should always be considered in concert with other local colleges.
A systematic process for developing new training programs can ensure participation by both employers and potential enrollees, as well as aid large campuses that are considering implementing multiple new programs simultaneously. For example, the Lone Star College System has a 10-step process for developing new, for-credit programs in 12 months, or alternatively fast-tracking program development in as little as three months.

Midland College identified several strategies for operating cyclically. For example, during recessionary periods, program development emphasizes longer-term daytime training programs as layoffs occur. As the oil and gas industry is booming now and the unemployment rate is 2.1%, no one is available for daytime training courses.

Therefore, Midland College is currently investing in building capacity for training programs with expensive equipment needs (i.e., truck driver simulators) and is working with the Mexican Consulate to recruit workers for the service industry where there is a shortage of workers.

Whether or not Texas elects to embark on enhancing or updating its current labor demand and supply estimation tools, the above recommendations remain useful. Even with an all-encompassing system like Florida has, Texas’ best practices would continue to apply. Texas is poised to consider whether now may be the right time to embark on building a comprehensive system similar to Florida’s. TWIC may want to consider the following issues and recommendations when determining whether to move forward with such a system:

- This project is an important first step in customer outreach. Estimating what tools “customers” in Texas are currently using and what they want are key steps in developing a useful tool. Continual customer outreach—to schools, employers, job seekers, and economic developers—is a crucial step in ensuring that the system will be used by those for which it is intended.

- The survey of tool users captured both tool users who possess highly skilled data research skills and those who do not have data research experience or resources. Therefore, any statewide tool should clearly state the data caveats and limitations of underlying data so the lay user has a foundation for use of the tool.

- While Florida’s system was implemented with a $1 million WDQI grant, a similar system in Texas is likely to be much less expensive to implement.
There are lessons to be learned from Florida’s experience that will provide cost savings.

- An important selling point for Texas is that a system modeled on Florida’s can be used by economic developers to provide comprehensive and timely occupational data to develop future business recruitment.

- Another selling point is that students (both two-year and four-year) would benefit from having real-time information on current jobs in demand and future projections of the labor market. TWC has worked with Texas Higher Education Coordinating Board (THECB) to develop Texas CREWS (Consumer Resource for Education and Workforce Statistics), an interactive dashboard designed to provide information to parents, students, school counselors, and others about outcomes from postsecondary education and workforce training programs in Texas. Implementing a model such as Florida’s would permit a cost/benefit analysis for students and parents to understand the investments they are making in education and student loans.
INTRODUCTION

PROJECT OVERVIEW

The Evaluating Supply and Demand Tools and Methodologies project was funded by the Texas Workforce Investment Council (TWIC) and conducted by the Ray Marshall Center (RMC) for the Study of Human Resources, part of the Lyndon B. Johnson School of Public Affairs at the University of Texas at Austin. This effort grew out of concerns among key workforce development stakeholders that more could be done to accurately measure labor demand and supply within the state of Texas, in real-time as well as over the short- and long-term. The purpose of this project was to assess the capabilities and availability of supply and demand planning tools used in Texas and other states around the country. Within this report, special attention is paid to the ability of these tools to anticipate occupational shortages effectively, enabling community and technical colleges to plan more effectively program offerings to meet the demands for technically skilled graduates in an ever-changing Texas labor force. To assess the adequacy of currently available labor supply and demand planning tools, RMC researchers set out to determine the way in which these tools are currently being utilized, and identify what groups and individuals are using them. In conversations with workforce development experts and tool users, and through a large-scale survey of tool users in Texas, this project sought to develop recommendations to improve the practical value of planning tools, whether by making changes to the existing tools, by connecting different tools or by developing new tools.

Throughout this report the following definitions apply:

- **Supply** – workers available to fill a job opening that requires a specific skill set. Most commonly, this would refer to people currently in or recently graduated from education or training preparing them for that position. Ideally, labor supply should be examined separately by region.

- **Demand** – jobs and/or positions open or soon to be, that will require a specific training or set of skills. Ideally, labor demand should be examined separately region.
• **Skill Shortage** – exists where the demand for employees with specific skills is greater than the supply of workers who are qualified, available, and willing to work. Skill shortages should be examined by region, ideally, but may only be available statewide.

• **Skill Mismatch** – exists where the supply of workers are over- or under-skilled for their current jobs. Skill mismatches should be examined by region, ideally, but in some cases may only be available statewide.

**RELEVANT RECENT LITERATURE**

One of the most frequent concerns raised regarding the state of the U.S. economy is the presence of skill mismatches, or shortages of workers equipped with the knowledge, skills, and abilities demanded by employers for specific occupations (Carnevale, Smith, & Strohl, 2013; Institute for a Competitive Workforce, 2012; Manufacturing Institute, 2011). However, there is often a lack of consensus on the consequences, magnitude, and even existence of such shortages (Neumark, Johnson, and Mejia, 2011; Teitelbaum, 2014). Much of this disagreement likely stems from differing approaches to defining and measuring labor supply and demand.

The purpose of this section is to review briefly some of the more recent scholarship on occupational shortages. We first discuss the way in which occupational shortages are conceptualized in the literature. We then review the primary ways in which labor supply and demand are quantified and the latest tools for doing so. This is followed by a discussion of the latest techniques for defining occupational requirements. Finally, we discuss a few elements of shortages that are important to consider.

Although a variety of definitions of occupational shortages exist, we use Barnow, Trutko, and Piatak’s (2013) definition as “a sustained market disequilibrium between supply and demand in which the quantity of workers demanded exceeds the supply available and willing to work at a particular wage and working conditions at a particular place and point in time” (p. 2). The benefit of this definition is that it encompasses the diverse causes of occupational shortages. The first is an insufficient number of workers overall with the education and skills required for the occupation in demand. The second is unwillingness on
the part of potential workers to accept employment in specific occupations at the prevailing wage or, put differently, unwillingness on the part of employers to compensate workers at a level sufficient to induce them to accept employment in the demanded occupations. The third is spatial mismatch between potential workers with the knowledge, skills demanded of the occupation, and the location of the occupations. The fourth is a temporal misalignment between when the work is needed and when labor is willing to supply that work. This definition is important to keep in mind, as it highlights the fact that simply identifying an occupational shortage is insufficient to effectively combating it. Shortages may be caused by a variety of underlying processes, and tools used to estimate shortages are more useful if they provide information on the magnitude and causes of shortages.

**Labor Supply**

While there are surely countless ways of estimating the supply of labor for a nation, state, or region, four methodologies appear to be the most commonly used and relevant for present purposes. The first simply tabulates the number of graduates of postsecondary education and training organizations in a given geographical area each semester or year and uses that tabulation as the estimate of supply of available workers. A near-future projection of labor supply can similarly be estimated by including current enrollment in education and training programs, although this technique may be less accurate given that a large percentage of students that enroll in postsecondary programs fail to complete them. The second technique for estimating is to include all individuals currently working in a given occupation. From the perspective of an individual firm looking to hire for a given occupation, individuals working in the same occupation in another industry would logically be considered part of the pool of eligible applicants. Including all workers in an occupation in estimates of labor supply provides a more holistic picture of the pool of potential workers than focusing exclusively on recent graduates. The third technique is to include data on individuals who are actively looking for employment, such as those who have applied for Unemployment Insurance (UI) or other state services that are aimed at assisting workers in their job search. Workers identify their previous occupation when submitting UI requests,
providing the state with data on the occupational background of potential applicants. The final approach makes use of labor market surveys to estimate the labor supply in a given region or the state. If the sampling frame is designed properly, this technique can provide a representative picture of the numbers of individuals looking for employment and their educational and occupational background.

**LABOR DEMAND**

Similar to methodological approaches for estimating labor supply, four approaches for gauging the demand for labor by occupation appear to be prominent in the literature and see frequent use by states. The first is the Bureau of Labor Statistics’ long-term projections of labor demand growth by occupation. The projections begin by forecasting the overall growth of the economy, then estimating the growth in the mix of industries in the economy, and finally predicting the growth or decline of various occupations that constitute those industries. The second approach is short-term projections. The most frequently used source of data for short-term estimates appears to be the BLS’ Occupational Employment Statistics (OES) program. OES surveys a sample of employers in each state to collect data on the number of employees in each occupation, their hours worked, and the wages they earned. Similar to the long-term BLS projections, short-term projections based on OES data estimate the growth in specific industries. They also calculate adjustments such as change factors (projected shifts in occupational usage within industries) and replacement needs (rates at which workers in occupations are likely to retire or permanently exit the occupation) to each occupation. These estimates are then used to calculate short-term projections of occupational growth and decline.

Both short- and long-term projections often experience long lag times, however, which is why the third approach for estimating labor demand, real-time estimates, is becoming increasingly prevalent (Carnevale, Jayasundera, & Repnikov, 2014; Milfort & Kelley, 2012; Reamer, 2013). As Carnevale, Jayasundera, and Repnikov (2014) note, although there are a variety of techniques within this overall approach, they generally share a few common steps. The first is often an aggregation of job vacancies, or “scraping,” from
a variety of data sources. The second is some type of data cleaning procedure to reduce duplicate entries. Finally, the text of each job opening is analyzed for descriptive information that can populate data fields. This step can use only the job titles supplied in the listings and match them to occupations, or the algorithm can attempt to extract the specific knowledge, skills, and abilities (KSAs) that employers are looking for in the position. Either way, this approach provides a much more up-to-date and nuanced picture of current labor demand than either projection methodology.

Although far less data-reliant than the previous three methods, the final technique used to estimate labor demand by occupation is simply speaking with or surveying firms and industrial associations, an approach that is obviously not mutually exclusive with the previously discussed approaches. This technique may be particularly useful for new and emerging occupations that do not have historical data. An example of this approach is the ongoing study by the RAND Corporation (2014) investigating the degree of demand for bachelors of applied technology (BAT) degrees in a variety of fields in which the BAT is not currently offered.

**OCCUPATIONAL REQUIREMENTS**

The previous sections reviewed a variety of different approaches to
estimating labor supply and demand, but one common theme that is relevant to all approaches is how occupational requirements are defined. Paths to entry are clearly defined for some occupations, particularly those that are highly regulated or require licensing and certification. However, many occupations exhibit far more diversity in terms of the skills workers need in order to enter the occupation. Firms may report specific educational and skill requirements in their job vacancies, but these advertised requirements may differ significantly from the actual distribution of education and skills for workers currently in the occupation. BLS attempts to provide education requirements for various professions through a variety of qualitative and quantitative methods, setting a single point as the “required” level of education for each occupation. However, some have criticized BLS’ required education levels as being unreflective of the education and training needed to secure a position in a given occupation and have proposed alternative methodologies for estimating the level of educational attainment one needs to be “competitive” in an occupation (Carnevale, Smith, & Strohl, 2010). Nevertheless, both techniques are limited to the extent that they merely provide estimates of the level of education required for the occupation, rather than the type of education and the specific skills and abilities employees need.

One way to overcome this limitation is by collecting data that are more detailed on the specific tasks and activities required of occupations and the knowledge, skills, and abilities that are required to perform those activities. This is the impetus for Texas’ Detailed Work Activities (DWAs) initiative (Froeschle, 2010). DWAs are aimed at describing the specific KSAs that are generally required for specific occupations. However, DWAs differ from occupational titles in that the KSAs are not specific to particular occupations. Just as occupations can be found in a variety of industries, DWAs are meant to identify KSAs that are potentially found across many occupations. Additionally, labor demands may shift over time due to factors such as changing supply of similar occupations or technological change. While the changes may not be so drastic as to require the reclassification of the occupation, employers need to be able to communicate these changing occupational requirements to job seekers. DWAs thus provide greater insight into the actual skills that employers are
looking for when attempting to hire. These desired skills can therefore be more effectively communicated to education and training organizations to ensure that training programs are providing future workers with the KSAs employers are looking for. Similarly, applicants searching for employment can get a better understanding of whether their own educational and employment background has sufficiently prepared them for a particular position and, if not, what educational and training institutions may have programs that can equip them with the skills and abilities they need.

A number of real-time labor demand estimation tools are now beginning to develop algorithms that can scrape job postings for both DWAs and KSAs in order to produce estimates of the specific types of skills that are in-demand in the economy. However, this approach is relatively new. While promising, it will likely take an appreciable amount of time before real-time demand estimators can produce accurate and reliable pictures of the skills demanded in any given region. It will also be some time before this can then be communicated in a useful form to education and training institutions that can provide workers with those skills.

**Dimensions of Occupational Shortages**

In order to fully understand the scope of occupational shortages, it is also important to consider the various dimensions of such shortages. The most salient dimensions of occupational shortages include the severity, the longevity, the geographic scope, and the unit of analysis used to define the occupation. Each one of these dimensions is discussed in greater detail below.

**Severity of the Shortage**

Similar to the longevity of a shortage, the severity of a shortage is difficult to define accurately. As previously discussed, occupational shortages may be caused by a variety of factors, including decreasing supply of workers, increasing demand, or disequilibrium between the prevailing wage and the wage required to induce workers to accept employment in the occupation. These various causes point to different methods of
estimating the magnitude of a shortage. One method would be to attempt to estimate the increase in the labor supply needed to meet labor demand. However, occupations vary substantially in terms of their “standard” or typical vacancy rates, making it difficult to compare the severity of shortages across occupations. The other method of estimating the severity of the shortage would be to attempt to estimate the magnitude of the wage gap between the prevailing wage and the wage that would be required to encourage workers to enter into the demanded occupations. For example, economists have attempted to estimate the wage premium that would be required to induce teachers to accept employment in hard-to-staff schools, such as under-resourced and high-poverty schools (Clotfelter, Glennie, Ladd, & Vigdor, 2008; Ingersoll, 2004). However, occupations differ significantly in terms of their wage dispersion, an issue exacerbated by the fact that the supply and demand curves for occupations are typically unknown. A relatively small estimated wage gap for a particular occupation may be evidence of a substantial occupational shortage in a different occupation.

**Longevity of the Shortage**

Although the definitions of occupational shortages discussed above are useful for identifying when a shortage exists, there are no clear standards for the time they must persist before the market condition can be termed an occupational shortage. For example, a company that decides to expand in a given locality may have a large number of vacancies for a period. The situation would not immediately be called an occupational shortage, but it is somewhat ambiguous how long the vacancies would need to persist before it becomes evident that a shortage exists. Additionally, higher-skill occupations generally have significantly longer hiring periods than lower-skill positions. Thus, applying a uniform temporal definition of occupational shortages may not be realistic or practical for a diverse set of occupations.
**Geographic Scope**

Perhaps one of the most challenging dimensions of occupational shortages is defining its geographic scope. National estimates of the supply and demand of occupations may provide a general sense of the trends in various occupations, but this national perspective may have little bearing on the realities of a given local labor market. Additionally, different labor markets have fundamentally different geographic scopes, with higher-skill occupations generally operating in more expanded national markets than less skilled occupations. Thus, even if a given geographic unit of analysis is chosen, such as a metropolitan area, the same methodology cannot always be used for estimating the existence of shortages in different occupations. An instrument effective at identifying local shortages in low-skilled occupations, where the supply of workers is primarily drawn from the local area, may overestimate the magnitude of shortages for higher-skill positions.

**Purpose and Organization of This Report**

The report provides both a descriptive analysis of primary data collected in an online survey and a cataloguing of labor supply and demand tools and data used in Texas, as well as findings from in-depth, semi-structured interviews with numerous local, state, and national workforce development, education, and labor market information experts. The findings in this report focus on labor supply and demand estimations for 2-year community and technical colleges in Texas. While some of the information and findings may be applicable to 4-year institutions, they were not the focus of the design, methodologies employed, or information gathered as part of this project.

The report is organized into six sections and three appendices. The second section describes specific research questions, methods, and data collected and analyzed for this project. The third discusses Texas tools used for short-term and long-term projections for the supply of community college and technical college graduates in Texas. The fourth section discusses tools and data used to estimate the demand for workers considering real time estimates and short-term and long-term occupational projections in Texas. Section 5
discusses the descriptive results from the survey of tool and/or data users and non-users conducted as part of this study. Finally, the sixth section summarizes findings from this report and provides conclusions, recommendations, and next steps for TWIC to consider. Appendices A-1, A-2, and A-3 are an annotated catalogue of labor supply and demand tools, and data sources identified during the course of this project for Texas and nationally. Appendix A-3 briefly references the LMI systems in three states—Florida, Kentucky, and Virginia—respectively. Appendix B contains the 51-question survey instrument.
RESEARCH QUESTIONS, METHODS, AND DATA

This report is designed to provide TWIC with an assessment of the various labor supply and demand planning and analysis tools currently used by workforce experts in Texas and other states. It provides information about the strengths and weaknesses of these tools, as well as describes best practices in other leading states and within particular community and technical colleges around Texas. This section presents the research questions addressed in this report, the methods used to answer these questions, and the data—both qualitative and quantitative—collected to answer the research questions.

RESEARCH QUESTIONS

This report addresses the following research questions:

1. What are the available supply and/or demand planning tools used in Texas? How well do these tools effectively anticipate occupational shortages to enable community and technical colleges to plan program offerings to meet the demands for technically skilled graduates in an ever-changing Texas labor force?

2. How are these tools being used, and what groups are using them?

3. What are best practices—including specific tools, data, or innovative practices—currently being used within Texas and in other states that, if disseminated, could improve the efficacy of planning programs or anticipating the demand for growing occupations?

4. Using the qualitative and quantitative information gathered as part of this project, what recommendations can be made to improve the practical value of planning tools, whether by making changes to the existing tools, connecting different tools, or developing new tools? Are there recommendations that specifically consider the inclusion of a prospective look at labor demand and accounting for student mobility within Texas?

RESEARCH METHODS AND DATA SOURCES

To provide context for their analysis, RMC researchers conducted in-depth interviews with workforce and labor market information experts in Texas and nationally,
and conducted a review of selected states Labor Market Information (LMI) websites. An inventory and description of existing tools and data used within Texas and leading states was taken. Researchers also surveyed labor supply and demand tools and/or data users within Texas. The methods and data sources used to answer the project research questions follow.

**In-depth Interviews with Experts**

During the first two months of the project, RMC researchers, in conjunction with TWIC advisors, identified and interviewed workforce development and labor market information experts (1) within Texas locally and from throughout the state; (2) at the national level; and (3) from various states that were identified by Texas and National experts as likely to have best practices. Researchers conducted semi-structured interviews using interview guides, both in-person, when possible, and on the phone when distance precluded face-to-face meetings.

Within Texas, interviews were conducted with over twenty institutional researchers and administrators at community colleges, technical colleges, Texas Workforce Development Board representatives, and THECB representatives. Researchers also interviewed economic developers, business and industry association representatives, recruiters, and business owners/industry representatives as appropriate.

At the national-level, RMC researchers interviewed six workforce development experts including several research and policy experts, former non-Texas state officials who have moved into national positions, and directors of national workforce policy organizations. Researchers also interviewed several state-level experts about best practices for estimating labor supply and demand.

**Review of Selected States’ LMI Websites to Identify Best Practices**

During conversations with Texas and national experts, RMC researchers identified several states likely to feature best practices for labor supply and demand tools and data. Researchers then conducted interviews and/or analyzed states’ LMI website to identify innovative tools and/or data sources. Eight states were originally selected because they
have well developed WDQI systems and linkages or were suggested as having best practices. Upon further examination, Florida, Kentucky, and Virginia were identified as having innovative practices that could inform Texas’ already well-developed workforce information systems. LMI websites for these three states were analyzed for best practices, and, to collect additional information, workforce experts from some of these states were interviewed by phone about their supply and demand planning tools.

In addition, given the advanced, more comprehensive nature of Texas’ workforce development system, each of the community and technical college experts that were interviewed also have innovative practices for estimating supply and demand that are described in this report. Best practices in Texas and these other states are highlighted in text boxes in relevant sections throughout this report.

**Inventory and Description of Existing Tools**

During the first six weeks of this project, RMC researchers identified existing labor demand and supply tools being used within Texas. The collected tools include tools and/or data that are used to make real-time, short-term, and long-term projections for labor demand and labor supply. Some tools are used to estimate only supply or only demand, while others are used for both purposes. Some tools are available free, while others are commercially provided, for-pay software programs customized and sold to users at various prices. The tools and data vary in their ability to measure demand/supply for skills locally, regionally, or at the state level.

Each of these tools and/or data sources are described in detail in their relevant sections—supply tools are discussed in Section 3, and demand tools are discussed in Section 4. Appendices A-1 Texas Tools and A-2 National Tools are a complete catalogue of all the tools and/or data sources identified in this project with a brief description, a list of the strengths and weaknesses for each, the type of users of each tool, common elements from each tool, and a short description of the methodologies/data behind each tool. Our discussion of tools and data also estimates the extent to which supply and/or demand for skills are measured locally, regionally, and/or at the state level. Tools that consider the mobility of recent graduates and workers, we discuss whether and how it is factored in.
Finally, Appendix A-3 provides a brief description of the LMI websites for Florida, Kentucky, and Virginia.

**Survey of Supply and Demand Tool and/or Data Users within Texas**

During the second and third months of this project, RMC researchers designed and conducted a large-scale survey of tool and data users. (Appendix B includes the full survey instrument.) Using the knowledge obtained from the in-depth interviews and an inventory of existing tools, the 51-question survey was developed. The topics addressed in the survey include:

- Demographics (e.g., organizational affiliation, job type, and county),
- Assessing the frequency of usage for various tools,
- The value of current and future estimates of job openings,
- The supply of community or technical college graduates,
- Methods used to gather labor demand and labor supply information,
- The importance of various factors in making informed decisions about workforce education and training,
- The most important factors in estimating workforce demand and supply,
- The usefulness of raw or excel spreadsheet data or pre-generated gap analysis reports,
- Which specific tools are used to gather labor demand, supply information, or both,
- How much is spent on commercial tools,
- Frequency of tool usage for each specific tool,
- Satisfaction with each tool,
- The type of information received from the tool or data provider, and
- Open-ended questions about positive or negative aspects of each tool.
Non-tool users were asked why they do not use tools for labor supply/demand analysis, whether they would be interested in using a tool, and which features would be most important to them in selecting a tool.

During interviews with key workforce development and labor market information experts from around the state, researchers identified potential respondents for the survey. The survey respondents included:

- 28 Workforce Development Board representatives,
- 80 Institutional Researchers at Community and Technical Colleges in Texas (obtained from THECB),
- Representatives from each of the Metro 8 Chambers of Commerce; collectively, the Metro 8 Chambers serve more than 20,000 businesses across Texas and represent the business sectors of the eight largest metropolitan cities in Texas (Arlington, Austin, Corpus Christie, Dallas, El Paso, Houston, Fort Worth, and San Antonio),
- 301 members of the Texas Association of College Technical Educators (TACTE), a professional organization serving workforce education in Texas community and technical colleges,
- 146 members of the Texas Association for Institutional Research (TAIR), the professional organization supporting institutional research, planning, evaluation, and policy analysis in Texas institutions of higher education,
- 799 members of the Texas Economic Development Council (TEDC), an Austin-based, statewide, non-profit professional association dedicated to the development of economic and employment opportunities in Texas, and
- 165 Community and Technical Colleges (CTC) Technical Deans, Workforce Deans, and Vice Presidents of Instruction.

After eliminating duplicate email addresses from the above lists, the survey was emailed to a total of 1,487 workforce development, education and labor market information experts around the state on June 9-10, 2014. Of these, 34 emails bounced or failed, leaving 1,453 potential respondents. Of these, 192 respondents started the survey, and 148 respondents completed the survey within the 15 days that the survey was open.
The analyses in this report describe the findings for the respondents that answered each question. Therefore, the total response rate for the survey was 13.2%.

As described in detailed descriptive analyses in section five below, while the response rate was low, the survey collected data from representatives of Community Colleges, Technical Colleges, Texas Workforce Development Board, Economic Development Companies, and Business/Industry.

**DATA LIMITATIONS**

There are four major data limitations in the survey and resulting analyses. First, the survey had a relatively low response rate—13.2%. While all areas of Texas were ultimately represented in the survey responses, urban areas of Texas were perhaps overrepresented in the data. Given the length of the survey and the short window in early summer when it was open, the response rate was not surprising. Nor was it low for surveys of this type. In fact, TWIC understood these risks, and achieving a high response rate was not TWIC’s chief goal. That said a lower response rate does limit generalizability of the results. Second, of the 192 respondents who started the survey, 44 of those dropped out at some point before completing the survey. This provides results that are more robust in the beginning of the survey than at the end, as sample size drops. In addition, there is an inherent bias introduced because emailed potential respondents who opted to respond and then opted to finish completely are likely to be those more interested in labor supply and demand tools in Texas. Third, the sample of respondents was not drawn randomly. Selected lists of respondents were created to reflect those actually using tools and data in Texas to measure and analyze labor supply and demand. This also limits generalizability beyond this specific population of tool users in Texas. Fourth, not all available tools and/or data sources could be included in the survey. In order to keep the survey length manageable, the number of tools included was limited. Although respondents were asked in open-ended questions to describe other tools they were aware of and whether or not they used them, it was not possible to collect comprehensive information on these additional tools.
The purpose of this portion of the report is to catalogue, describe, and assess the various tools used in the state of Texas for estimating labor supply. This section discusses the methodological approaches of these tools and their strengths and weaknesses. While literature is used as a framework for understanding the way in which the tools are constructed and their limitations, the tools are approached from the perspective of the end-user in order to assess their appeal and ease-of-use. Each tool is analyzed to determine whether it is capable of producing labor supply estimates at the local, regional, and/or state level. Whether and how worker mobility is measured in the resulting labor supply estimates is also described. Text boxes highlight best practices identified in other states and within Texas over the course of this project. Finally, the section concludes with common themes across tools and the overall capability of the array of labor supply estimation tools in the state to gauge labor supply accurately. An annotated catalogue of each of the tools described in this section appears in Appendix A-1.

**Labor Availability Estimator (LAE)**

The Labor Availability Estimator (LAE) tool helps estimate the available supply of appropriately skilled workers (http://www.texasindustryprofiles.com/apps/lae/index.asp). The first step in using the LAE tool is to select an industry based on the North American Industry Classification System (NAICS) classifications. After selecting an industry, the user has the option of calculating supply estimates for the state or a workforce development area (WDA) or region of interest. The tool then generates a report of the specific occupations associated with that industry, including Standard Occupational Classification (SOC) code and title, as well as estimates of the numbers employed in those occupations and the supply of individuals available to work in the designated industry. The estimate of the total number of workers in the region capable of working in each listed occupation is composed of four separate data points. The first is the number of individuals that are currently working in that occupation. The second is the number of individuals who applied
for UI benefits or other assistance from the TWC and who were last employed in the listed occupation. The third is a calculation of the number of individuals who graduated from an educational program in the region qualifying them to work in the occupation. These data can also be broken down by educational institutions to allow the user to determine what institutions are providing education and training programs connected with the occupation and the number of individuals that graduate annually from each program. The final data element is an estimate of the number of individuals in related employment.

The LAE is likely the Texas tool that provides the most holistic assessment of the available labor supply for specific occupations. However, the tool has limitations that users must bear in mind. The first is that the data appear to be outdated. The current employment estimate is from approximately four years ago, data for recent graduates are from three years ago, and the most recent data are the TWC applicant information, which is from two years ago. These estimates may not be very useful for rapidly changing occupations. Additionally, the related employment category is complex and warrants further discussion. This element is an estimate of “the number of attractable persons in the region currently working in occupations similar to the given occupation,” defined as “workers employed in similar occupations...if their current wage is less than or essentially equal to (within 5% of) the target occupation's mean wage” (http://www.texasindustryprofiles.com/apps/lae/index.asp). While it is possible that such workers are eligible to be recruited into the target occupation, in many instances the estimate of individuals in related employment is substantially higher than the numbers actually employed in the occupation. As an example, approximately 2,600 sales representatives were employed in a specific WDA, while the estimate of those in related employment was approximately 62,600. The total labor supply estimate was thus more than 20 times the number actually employed in the occupation. However, this information may still be valuable to employers that are interested in broadly estimating the pool of potential candidates from which to draw.
**Applicant Availability Indicator (AAI)**

Similar to the previously described tool, the Applicant Availability Indicator (AAI) ([http://www.texasindustryprofiles.com/apps/wai/index.asp](http://www.texasindustryprofiles.com/apps/wai/index.asp)) provides estimates of the number of individuals who have applied for UI benefits or other TWC assistance. Once again, the user first selects an industry and then either WDA or statewide estimates. The tool then produces a list of occupations in that industry and the number of TWC applicants who were last employed in each listed occupation in that geographic area. The additional benefit of the AAI compared to the estimates of TWC applicants from the LAE is that it also provides data on whether individuals speak English, Spanish, or both, and their years of experience in the given occupation. The user can therefore determine not only the number of applicants available for a particular occupation, but also the amount of experience they may have in it. However, the AAI website does not state the years for which the data were collected, so it is unclear whether the tool provides up-to-date estimates of available applicants or not. Additionally, in comparison to the LAE, this tool provides far less information on the total number of individuals employed in the target or similar occupations.

**State Training Inventory (STI)**

As stated on its website, “The State Training Inventory (STI) is a compilation of Texas education and workforce training providers, their programs, contact information, labor market information, enrollment and graduation data where available” ([http://www.texasindustryprofiles.com/apps/sti/index.asp](http://www.texasindustryprofiles.com/apps/sti/index.asp)). Unlike the previous tools, which focus primarily on occupations, the STI is designed to provide estimates of the formal labor supply, namely the numbers of graduates of education and training programs in the state. Rather than selecting an industry and then identifying occupations within that industry, users identify potential workers by selecting Classification of Instructional Program (CIP) codes, the federal classification scheme for educational programs. The tool therefore generates estimates of the total number of individuals, either statewide or by WDA that graduated from a designated CIP. The user can produce these estimates in one of two ways. Either
they can begin by selecting the CIP, which produces a list of all educational institutions in the state, or they can first select a particular WDA and restrict the list of educational institutions that offer the CIP to only those in the designated region. The total number of graduates for each institution listed is then produced. This tool also gives users the option of specifying the award level (e.g., AA/AS, BA, MA) of the credential if they would like to restrict the supply estimates to only those workers with a given level of educational attainment.

While the STI provides greater information on educational attainment and degree awards than the previous tools, it has a few issues that decrease its ease of use. If one begins by selecting a program of study, the tool allows the user to select progressively more granular educational programs. It begins with broad two-digit CIP codes and then provides the option of selecting more detailed four- or six-digit codes. For example, engineering is a two-digit CIP code, computer engineering is one of the four-digit codes within this category, and computer hardware technology is one of the more fine-grained six-digit codes. This feature helps users who may be unfamiliar with the more detailed six-digit codes. However, if one first selects a WDA, the tool only lists the six-digit CIP codes offered by all educational institutions in the region. These lists can be quite extensive, making it difficult to identify programs of study without some familiarity with the CIP coding scheme. Additionally, the option of selecting an award level is not available if one first selects a WDA. Finally, and perhaps most importantly, the tool does not provide any information on whether graduates of the selected programs are still located and working within the region. Thus, while the STI provides an extensive amount of information on the graduates of education and training programs in the state and WDAs, the numbers of these graduates that are actually part of the labor supply in a given region is unknown.

**STRATEGIC WORKFORCE ASSESSMENT PROGRAM (SWAP)**

The primary purpose of the Strategic Workforce Assessment Program (SWAP) is to “simplify the complex challenge of identifying the necessary skills and training programs related to any industry cluster or sector” (http://www.texasindustryprofiles.com/apps)
SWAP). However, the tool also provides some detail on labor supply. One can search by either industry or occupation. Searching by industry provides a snapshot of the numbers of individuals employed in various industries, the percentage change in employment over the past three years, and projected changes in employment to 2020 drawing from BLS long-term projections. The occupational search provides much greater information. One can

VIRGINIA: COMPREHENSIVE SUPPLY DATA AT SEVERAL GEOGRAPHIC LEVELS

The Virginia LMI website (https://data.virginialmi.com/vosnet/Default.aspx) is a detailed online labor market analysis tool that can be accessed through the internet or the intranet at One Stop centers. The site is designed to be used by job seekers, students, employers, training providers, workforce professionals, and others seeking to explore local labor markets.

On the supply side, the tools are as follows:

- **Education Program Completers** - This is the most useful tool available on Virginia’s website. It lists the number of completers in various programs, in a certain year in the MSA, state, county, community college region, and workforce region. However, the data provided are only through 2007.

- **Training Providers and Schools** - A search bar permits searches for any school or training provider. A complete alphabetical listing is also available. The tool lists all private, non-profit, and public four-year colleges, two-year technical and community colleges, hospital or health programs, secondary schools, and other education and training institutes.

- **Training and Education Programs** - This tool permits program searches by name, program classification, qualification, program cost, type of instruction (e.g., online, classroom, both). Listings can be sorted for smaller geographic areas, such as workforce region or zip code.
search the entire state or a WDA for occupations within one of the 16 Achieve Texas Career Clusters. After choosing a cluster, a list of occupations is produced in a table that includes

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**FLORIDA: MOST COMPREHENSIVE “POTENTIAL” LABOR SUPPLY**

The Florida Occupational Demand/Supply System developed by the Florida Department of Economic Opportunity (DEO) estimates “potential” labor supply—because job seekers are not required to register—using the following sources of information:

- **Florida College System** (includes the 2-year community college system and some 4-year colleges),
- **Florida State University System** (SUS) (public),
- **Independent Colleges & Universities of Florida** (ICUF) (private),
- **Registered job seekers in the workforce information system** (career centers),
- **Workforce Investment Act participants,**
- **District Post-Secondary Career & Technical Education,** and
- **Commission for Independent Education** (private secondary career educators) (Rust & Whitfield, 2014).

Regional reports do not include ICUF and SUS data in total supply because university graduates are considered statewide supply and not confined to one region. Statewide supply reports do include university graduates.

DEO clearly states many limitations their data have—such as, enrollees may or may not complete training and that most job seekers do not register with career centers. However, DEO’s estimates are not based on Integrated Postsecondary Education Data System (IPEDS) data (as many are) since these data are from two years ago; rather they obtain data from the current semester or year from each institution (Ibid.).

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1 The 16 Achieve Texas Career Clusters are: Agriculture, Food, and Natural Resources; Architecture and Construction; Arts, A/V Technology and Communications; Business Management and Administration; Education and Training; Finance; Government and Public Administration; Health Science; Hospitality and Tourism; Human Services; Information Technology; Law, Public Safety, Corrections, and Security; Manufacturing; Marketing; Science, Technology, Engineering, and Mathematics; and Transportation, Distribution, and Logistics.
SOC codes and titles, numbers employed, educational requirements, and information on Detailed Work Activities to give users a sense of the actual activities required within each occupation. With some effort, one can also navigate from these descriptions of occupations to find specific educational programs, including CIP codes that are related to the occupations. The labor supply data consists only of estimates of the number of individuals currently working in the given occupation. No additional data are provided on the number of TWC applicants qualified for the occupation or individuals employed in similar occupations.

**Gainful Employment Placement Rates (GEPR)**

One of the tools for estimating labor supply provided by the THECB is the Gainful Employment Placement Rate (GEPR) calculator (http://www.txhighereddata.org/reports/performance/ctcasalf/gainful.cfm). Similar to the STI, the GEPR is designed to provide estimates of the formal labor supply disaggregated by CIP. One can either select the entire state or a particular institution or produce estimates of graduates by CIP, with the option of also selecting the award level. In contrast to the STI, the tool also provides data on the number of graduates that are currently gainfully employed, the mean and median earnings for these graduates, and whether or not they are still enrolled in postsecondary education. Thus, this tool may provide a more accurate picture of the available labor supply by also providing data on the numbers of graduates that have not already found employment. However, the tool does not have the option of first selecting a workforce region. If one were interested in the total number of graduates in a region, one would have to be knowledgeable of the educational institutions in the region and produce estimates separately for each institution. Additionally, the tool does not provide information on whether graduates are still located and working in the region, making it difficult to determine the number of potential workers that are in a region’s labor supply.
SUMMARY

While each tool described above provides a different perspective of the Texas labor supply, a number of common themes emerged from our analysis of the strengths and weaknesses of the tools. The first and most important finding is that each tool has a number of limitations, so a holistic assessment of the labor supply likely requires the user to utilize multiple tools. Another drawback of all of the tools is the outdated nature of much of the data. The most recent labor supply data were from 2012, approximately two years ago, and some of the data used for the estimates were from even longer ago. These data may be sufficient for long-term planning, but the lack of up-to-date labor supply estimates may be a hindrance for businesses and firms with shorter project and hiring timelines. Finally, none of the tools were designed to account for the migratory flow of workers. Most of the tools included all recent graduates from the region in the estimates of the formal labor supply, yet it is unlikely that all graduates remain within the region. The GEPR tool has the added benefit of providing data on whether recent graduates are currently employed or not, but this tool still cannot account for worker migration. The one labor supply estimation technique that could address this challenge is a labor supply survey, which would account for worker mobility and migration in determining estimates of the local or regional labor supply. However, Texas currently does not have such a tool in its labor supply toolbox.
ESTIMATING LABOR DEMAND: OCCUPATIONAL PROJECTIONS IN TEXAS

This section of the report catalogues, describes, and assesses the various tools used in Texas to estimate labor demand. The methodology for each tool is discussed as well as both their strengths and weaknesses. This section also evaluates the ease of use and the ability to estimate labor demand at the local, regional, and/or state level for each tool. Finally, this section concludes with common themes across tools and the overall capability of labor demand estimation tools used in Texas. An annotated catalogue of each of the Texas tools described in this section appears in Appendix A-1, and a detailed description of the U.S. Bureau of Labor Statistics’ forecasts can be found in Appendix A-2.

STANDARD OCCUPATIONAL COMPONENT FOR RESEARCH AND ANALYSIS OF TRENDS IN EMPLOYMENT SYSTEM (SOCRATES)

The Standard Occupational Component for Research and Analysis of Trends in Employment System (SOCRATES) is a software tool developed by TWC for local Texas planners to conduct regional labor market analyses (http://socrates.cdr.state.tx.us). SOCRATES allows planners to generate a list of occupations within a particular industry for a given local WDA. SOCRATES is particularly useful for planning under the Workforce Investment Act (WIA) because planners can generate lists of Targeted Industries and Targeting Occupations.

SOCRATES can be used to analyze a region’s performance relative to the nation. It can rank industries in a certain area according to different economic factors allowing personalized targeting. SOCRATES also generates County Narrative Profiles, Occupational profiles (that provide reports on each SOC coded occupation), and a list of employer contacts with information about the employers. It also has tools that help identify which industries are growing within a given regional economy. The design is simple and includes job descriptions, educational requirements, and work activities for occupations.

One limitation of the tool is its inability to provide local data. The data provided are based on WDA regions and lack detail that can more finely assist in local labor planning. Interviews with experts also informed us that SOCRATES does not account for new jobs very
well (Miller, 2014). The taxonomies of the U.S. Department of Labor’s Occupational Information Network (O*NET) are revised only every seven years, which means that emerging occupations may be omitted. It also uses SOC codes that often do not indicate the specific skills required for some occupations. For example, this occurs in the information technology industry where the SOC titles cover general duties, such as Computer Programmer without indicating the required sub skills, such as the programming language.

**Texas CARES**

Texas CARES, designed by the Labor Market and Career Information (LMCI) division of TWC (http://www.texascaresonline.com), is a system designed to help individuals explore different careers and related educational opportunities in Texas and around the country. It provides information on which occupations are growing and which have the most current openings. It also provides self-assessment and skill transferability—skills used in some occupations that will also be useful in others—matches for individuals who are just starting to work. It also allows individuals to compare different jobs so that individuals can make informed career choices. The audience for this tool is primarily consumers and job seekers. Although the tool provides access to useful information, it is difficult to navigate, causing it to be of limited value. This might explain why our survey ranks it low in the frequency of use.2

**Texas Rapid Access to Career and Economic Services (TRACER)**

LMCI also designed the Texas Rapid Access to Career and Economic Services (TRACER) (http://www.tracer2.com.) TRACER provides comprehensive employment data and long-term industry and occupational projections for government and state agencies, as well as for education and training organizations. TRACER also provides information on the latest economic indicators such as current labor force statistics and trends, nonfarm industry

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2 Our survey results are discussed in more detail in the next section.
employment, Texas mean and median salary (using OES data), and Unemployment Insurance claims.

**KENTUCKY: EASILY NAVIGABLE USER-FRIENDLY WEBSITE**

Kentucky’s LMI website (https://kylmi.ky.gov/vosnet/Default.aspx) provides a good example of how to create a user-friendly website. It is easy to navigate with well-done graphics. The home page clearly lists all the topics covered on the second level. For example, the front page has links for the different intended audiences including Job Seekers, Resources, Education, Publications, and Quick Links. The simple home page makes the initial presentation less intimidating but also makes it clear where to look for more information.

Under job seekers, the following headings are clearly listed: Area Profile, Occupation, Industry, Comparisons, and Employers. Clicking on any of these headings provides links to common searches with clearly written instructions. For example, under “Area” there is the ability to select the state as a whole or a particular County, Metropolitan Area, Planning Region, or Workforce Region to obtain relevant information about wages, workers, unemployment, etc. Long-term Occupational Outlook and Industry Projections are provided for each geographic level providing projections to 2018.

Overall, the strengths of Kentucky’s website are its navigability and presentation. The website avoids complication until necessary—burying secondary information on the second level and allowing you to select display options as you go. The variety of presentation forms—data in tables, maps, and graphs—is consumer-friendly.

Brief LMCI economic profiles are also available in TRACER. They cover Texas as a whole, the Metropolitan Statistical Area (MSA), and the WDAs. Similar to the LMCI economic profiles are TRACER’s Business Employment Dynamics (BED). BED provides statistics that present an accurate picture of labor market dynamics by giving a list of gross job gains and gross job losses. However, the BED statistics do not provide labor information at the local level.

TRACER’s occupational projections also provide data on the level of education needed for each occupation, but these educational requirements do not include any information on the specific degrees and programs that are required in that occupation. One
benefit of the TRACER tool is that it also provides county profiles that list employment data as well as commuting patterns.

**U.S Bureau of Labor Statistics Forecasts**

The U.S. Bureau of Labor Statistics (BLS) provides 10-year projections on occupations and industries (http://www.bls.gov/emp/). This section focuses on the tool specifically and its ability to forecast labor demand. BLS forecasts include in-depth information about the forecasted labor demand. The tool includes information on wage, entry-level education, and on job training, if any. It lists fastest growing industries with jobs that are experiencing the largest rate of percentage change. BLS calculates these long-term projections to provide information about how the labor market is expected to change. Detailed descriptions of more than 500 occupations are included in the Occupational Outlook Handbook. It also lists the reasons why the occupations are projected to grow or decline in the long term.

BLS data is the only long-term projection data available at the national level. One drawback of this data is that it has limited local and county level data applicability. Another issue with these long-term estimates is that long-term occupational projections have high chances of error (Carnevale, Smith, & Strohl, 2010; Barnow, Trutko, & Piatak, 2014) and they weigh current observations more heavily (Strohl, 2014). Some analysts also say that BLS projections are accurate only 60% of the time (Dorrer, 2014).

**Commercial Software Using Real Time Information**

As discussed in the literature review, the labor market changes rapidly and that lag time is a significant obstacle in data usage. Recognizing the need for such real time data estimates, commercial for-profit companies have developed sophisticated technologies to address this perceived gap. These commercial software programs use real time online job advertisements to assess hiring trends, job requirements, and compensation for industries and occupations.

These tools use a web spidering or crawling—systematically browsing the Internet to index the contents of numerous web pages—to access millions of online job advertisements
posted on various boards, aggregating them to provide detailed timely information about the industry, trends, and compensation. Web crawling provides a comprehensive analysis of labor demand. The strength of this approach is that there is minimal lag time between when job openings are posted and when the data are available through aggregation services.

This approach, however, has several limitations. First, it does not provide an accurate picture of employment across all industries because certain industries, such as the retail industry, do not use online job advertisements and, therefore, may be underrepresented. In the retail industry, job advertisements often appear locally rather than online.

Second, there may be duplication in job postings. The same job may be posted online in more than one place. If the gathered information is not de-duplicated, the results may overestimate the number of openings for a given occupation. While the information is de-duplicated in for-pay tools, the ability to catch duplication may vary across different commercial tools.

Third, internet job postings may overestimate the number of job openings because some employers may advertise for positions to assess the pool of available applicants rather than to hire for a specific position.

Burning Glass, Economic Modeling Specialist International (EMSI), and Wanted Analytics are the most commonly used commercial tools in Texas. Given the focus on Texas tools, an in-depth analysis of these commercial tools is outside the scope of this report. Additional information on these tools is provided in Appendix A-2.
FLORIDA: MOST COMPREHENSIVE AND TIMELY OCCUPATIONAL SUPPLY/DEMAND SYSTEM

The Florida LMI website (http://www.floridajobs.org/labor-market-information) is a detailed online labor market analysis tool developed by the Florida Department of Economic Opportunity (DEO) using a $1 million WDQI grant from the U.S. DOL. Developed in response to the recent recession, Florida’s system is “designed to improve education and training alignment to better meet the needs of business” (Rust & Whitfield, 2014).

While Florida’s system draws only upon previously existing data sources, this is the first time it has all been pulled together into one place. The indicators of potential labor supply by occupation are “Workforce, public and private postsecondary education (enrollees, completers, and graduates based on CIP-SOC);” and “job seekers registered at career centers” (Ibid.). The indicators of labor demand are “Help Wanted OnLine (HWOL) data series of monthly job ad openings by occupation (for short-term analysis)” and “DEO LMS average annual projected openings by occupation (for long-term analysis)” (Ibid.). Short-term is defined as “real-time” which can be generated daily or every three hours, but DEO uses monthly estimates. Long-term is defined as 8-year projections (Ibid.).

Florida’s DEO describes their program as highly successful at business recruitment since prospective businesses considering whether to locate in Florida can receive instant information on the number of job seekers, how many are employed, current training programs, and how many training program completers there are within their industry and occupation.

Florida’s DEO believes that students and their parents will use their website to better understand their education investment and student loans. Educational data for the minimum level of education required by an occupation is provided by the Department of Education data, whereas, BLS job training codes provides only information for entry-level positions.

Summary

Although Texas has a number of tools that can be used to estimate demand for labor, either statewide or for a given locality, these tools have some limitations. One limitation is the inability of Texas tools to estimate labor demand at a geographic level smaller than WDAs. For larger WDAs in Texas, both planners and job seekers may benefit from labor demand estimates for a county or an MSA. Another limitation is that, the data
underlying labor demand estimates are somewhat outdated, potentially providing an inaccurate picture of labor demand. Therefore, education and training institutions may rely upon other methods, such as formal and informal information gathering with employers, to better estimate current labor demand.

There is not currently a tool in Texas that effectively combines labor supply and labor demand estimates to produce comprehensive labor market analyses in real time or in the short-term. While some of the tools described in this section can help provide pieces of that puzzle, it would require significant time and effort to assemble an accurate, up-to-date gaps analysis.
RESULTS FROM THE SURVEY OF TOOL USERS

The survey conducted by RMC researchers was designed to assess how labor supply and demand tools and data are used in Texas. The 51-question survey was answered by 192 respondents out of 1,453 surveys emailed during the two-week period it was open, for an overall response rate of 13.2%.

RESPONDENT DEMOGRAPHICS

Figure 1 shows the number of respondents from each Texas WDA. More densely populated WDAs in Texas—Tarrant County, Greater Dallas, Gulf Coast—had more respondents to the survey, 12, 15, and 20 respondents, respectively. However, the East Texas, West Central Texas, and Central Texas WDAs each had 10 or 11 respondents. North Central Texas, Heart of Texas, and Alamo WDAs each had nine respondents. All 28 WDAs had at least one respondent, with South Texas and Middle Rio Grande having one each. Of the 192 total respondents, four declined to answer this question.

Figure 1. Number of Respondents by Texas Workforce Development Area
Figure 2 shows a map of Texas WDAs and the numbers on the map correspond to the numbered WDAs in Figure 1. As shown, all parts of Texas are fairly well represented in the survey responses, with the exception of two border WDAs—South Texas (#21) and Middle Rio Grande (#27)—each with only one respondent.

**Figure 2. Map of Texas Workforce Development Areas**

One of the purposes of the survey was to reach organizations that use tools and/or data to estimate labor demand and supply, including community colleges, technical colleges, Texas WDBs, economic development firms, and business and industry associations. Figure 3 shows respondents’ organizations as reported on the survey. The largest share of respondents was from community colleges (41%), and the second largest share was from economic development firms (34%). Not surprisingly, a smaller percentage of respondents were from technical colleges (8%) and Texas WDBs (10%). The lowest response (just 2%) came from business and industry associations. However, the survey was only sent to the
Metro 8 Chambers of Commerce. An additional four percent of respondents selected “other” as a response for their type of organization (these came primarily from government agencies).

Figure 3. Respondents’ Organizations

![Bar chart showing distribution of respondents' organizations.]

- Community College: 41%
- Technical College: 8%
- Texas Workforce Development Board: 10%
- Economic Development: 34%
- Business/Industry Association: 2%
- Other: 4%

Figure 4. Respondents’ Occupation

![Bar chart showing distribution of respondents' occupations.]

- Business Owner/Economic Developer: 8%
- Researcher: 16%
- Administrator: 59%
- Industry Representative: 2%
- Recruiter: 7%
- Other: 7%
Figure 4 shows respondents’ occupation as reported in the survey. The majority of respondents—59%—are administrators, likely working at community and technical colleges. Institutional researchers make up 16% of the respondents, and half that many (8%) are business owners or economic developers. A very small share report being industry representatives (2%), and an equal share are recruiters (7%) or report their occupation as other. Again, this “other” is largely made up of government workers.

Before describing the use of supply and demand tools, respondents were asked how often they used tools to assess labor supply and demand. As shown in Figure 5, the vast majority of respondents—88%—indicated that they frequently or occasionally use supply/demand tools; this share is equally split between frequent and occasional use. A small share—6%—of respondents indicated that they “do not use them now, but have in the past.” These nearly 95% of respondents are considered tool users and are asked in detail about the types of tools they use and in what way they are used. The remaining 10 respondents are considered non-users since they answered that they “have never used them.”

Figure 5. All Respondents: Frequency of Tool Use for Supply or Demand
VALUE OF ESTIMATING LABOR SUPPLY AND DEMAND AND METHODS FOR GATHERING THIS INFORMATION

The next several sections present survey results for tool users. Respondents were asked whether it is valuable to be able to estimate currently available and potential future workers. Only two respondents out of 177 indicated that it was not valuable to their organization to be able to analyze differences between the number of workers currently available in a region and available job openings in that region. Likewise, only one respondent out of 177 indicated that it was not valuable to their organization to be able to analyze differences between the number of potential future workers available and projected available job openings in that region.

Despite the overwhelming response that this information is valuable, nearly one-third of respondents indicated that they did not currently have a satisfactory picture of trends in the supply of graduates or in the changes in labor demand. In particular, 29% of respondents indicated that they believe that they currently have a satisfactory picture of trends in the supply of graduates and other potential workers to plan for their organization’s future. A similar proportion of respondents—34%—said that they believe that they currently have a satisfactory picture of trends in the changes in demand for workers to plan for their organization’s future. This leaves about two-thirds of respondents without supply and demand information that they consider valuable to their organization’s future.

When asked what methods are used to gather information about labor supply, one-third of responses (30%) indicated that they used reports on quantitative labor market data gathered and analyzed by an outside organization or consultant. Twenty-seven percent of responses indicated that labor supply information is gathered through formal or informal information gathering with employers. Nearly one in five responses (18%) indicated a reliance on quantitative labor market data gathered and analyzed by their own organization to obtain labor supply information. Finally, about one-tenth of responses indicated labor supply information gathering from formal or informal meetings with students (11%) and faculty (13%).
When asked what methods are used to gather information about labor demand, one-third of respondents (30%) indicated that they used reports on quantitative labor market data gathered and analyzed by an outside organization or consultant. Meeting formally or informally with employers (25%), faculty (12%), and students (12%) were also often cited as sources of labor demand information. Finally, one in five responses (19%) indicated a reliance on quantitative labor market data gathered and analyzed by their organization to obtain labor demand information.

Workforce education and training are essential to producing a skilled labor force. Respondents also were asked how important various factors are in making good decisions about workforce education and training. Figure 6 shows that feedback from employers (91%) and accurate data about the current job openings and labor availability (85%) were most often cited as important factors in making education and training decisions by the vast majority of respondents. A factor cited by three-quarters of respondents (76%) as very important included accurate short-term (1-5 years) predications about job openings and labor availability. This compares to a smaller percentage (60%) who responded that long-term (5+ years) predications about job openings and labor availability is a very important factor in planning workforce education and training. While very important to over half of respondents, feedback from current employees/students (62%) and feedback from former employees/students (57%) were less frequently cited as very important factors. In fact, almost no respondents—0 to 2%—cited any of the listed factors as not very important or very unimportant.

Respondents were then asked to name the three most important things for their organization in estimating workforce demand and supply. About one-quarter of respondents—23%—indicated that quality data were the most important thing. Nearly one-fifth of responses also indicated that quality reports (18%) and formal or informal information gathering with employers (17%) are the second and third most important things in estimating workforce demand and supply. This finding seems to indicate that the priority should be placed on obtaining quality data and information that can be used to produce reports, but that even quality data cannot replace the information to be gathered from employers. Many fewer respondents indicated that a quality tool (12%) is important
for estimating labor demand and supply. Even fewer responses indicated that well trained staff (10%) and formal or informal meetings within their community (9%), with students (6%), or with faculty (5%) are important for estimating workforce supply and demand.

Given respondents’ interest in quality data and quality reports, it is not surprising that the vast majority (87%) of respondents indicated that access to raw or Excel spreadsheet supply/demand data (rather than in PDF form) would improve the ability of their organization to be successful. An even higher percentage of respondents (96%) indicated that they would find it useful to have access to pre-generated supply/demand gap analysis reports by region.

These responses indicate that Texans currently in positions to estimate labor supply and demand want greater access to better data and to regional gap analysis reports. The clear desire for data and/or reports is particularly stark when considered against the backdrop of how respondents rate the current availability of supply/demand data. Over three-quarters of respondents said that the current availability of data is either fair (46%) or good (37%). One in ten find data availability poor (10%), and the smallest percentage find data availability excellent (4%).

**Assessment of Tool Usage in Texas**

After determining the value of labor supply and demand information to respondents and the methods they prefer for obtaining the information, respondents were asked about their current tool usage. In particular, respondents were asked about five tools or groups of tools:3

1. Commercial for-pay software;
2. The Strategic Workforce Assessment Program (SWAP);
3. Four tools from TWC:
   a) Standardized Occupational Components for Research and Analysis of Trends in Employment System (SOCRATES);

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3 This is not a comprehensive list of available tools in Texas; however, for the purposes making the survey a manageable length, some tools were not included. A complete annotated catalogue of tools is available in Appendix B.
b) Labor Availability Estimator (LAE);  
c) Texas CARES; and  
d) TRACER.  

4. BLS Forecasts or Data; and  
5. Another tool, including one of in-house design.

Respondents who indicated that they use a particular tool were then asked about their frequency of tool usage, whether they use it for labor supply, labor demand, or both, about the types of information obtained from the tool, and about how the tool performs in various areas.

**Figure 6. Importance of Various Factors in Making Decisions about Workforce Education and Training**

![Bar Chart showing the importance of factors in decision making for workforce education and training](chart.png)
Figure 6 shows the types of tools or data most frequently used by survey respondents. The most commonly used data are the BLS forecasts or data—118 respondents (83%) use BLS data to estimate labor supply or demand. Three-quarters of respondents use one or more of the four TWC tools mentioned here. Since the survey asked about usage for these four tools jointly, it is not possible to determine from the data which tool is being used by whom. Furthermore, it is important to note that the Labor Availability Estimator (LAE) is one of approximately 20 modules within Texas Industry Profiles. In addition, SOCRATES is a tool with six unique modules, but for reasons of brevity it was treated as a unit. Forty percent of respondents use SWAP and 22% of respondents use another tool. When asked what other kinds of tools respondents are using, many respondents listed various sources; however, no two respondents listed the same source. Examples of tools and/or sources of information listed by respondents include:

1. Texas CREWs, a new tool that TWC has not yet released;
2. Local TWC representative;
3. Grad Cast, used for student placement and tracking;
4. Trade journals;
5. U.S. Department of Labor (DOL) Outlook Handbook;
6. Demographics Now; and
7. SitesOn Texas was recommended by one user but another user said they did not like it.

About one-third of respondents (32%) said that they use commercial for-pay software, as shown in Figure 7. Figure 8 shows the type of commercial for-pay software being used by respondents. The majority of respondents (63%) reported using EMSI, while one-third indicated using Wanted Analytics, and 17% are using Burning Glass. Twenty-six percent reported using other commercial software. When asked to specify what other commercial for-pay software they were using, three respondents listed SitesOn Texas, and one respondent each said GradCast and Applied Geographic Solutions (AGS) trend data with TETRAD’s Census for MapInfo software. The majority of respondents did not indicate what other commercial for-pay software they are using.
Figure 7. Types of Tools or Data Used by Respondents

- Commercial For-Pay Software: 68% Yes, 32% No
- SWAP: 60% Yes, 40% No
- SOCRATES Labor Availability Estimator Texas CARES TRACER: 25% Yes, 75% No
- US BLS Forecasts or Data: 17% Yes, 83% No
- Another Tool: 78% Yes, 22% No

Figure 8. Commercial For-Pay Software Tools or Data Used to Estimate Labor Supply and Demand

- Wanted Analytics: 30% Yes, 70% No
- Burning Glass: 17% Yes, 83% No
- EMSI: 63% Yes
- Other: 26% Yes
When asked about the expense for access to a commercial for-pay software/tool or labor market data, 38% of respondents did not know what it would cost. Figure 9 shows these data. While some (15%) respondents said that their organization does not pay anything for the software or tool, nearly half (47%) said their organization paid some amount. Of those respondents whose organizations pay, most paid between $5,000 and $9,999 annually—17% of respondents said that their organization paid this amount. For 6% of respondents, the annual fee of over $15,000 is quite expensive; however, 11% of respondents indicated that their organizations paid less than $5,000 for labor market data or to access a commercial tool annually.

**Figure 9. Annual Cost to the Organization of Commercial Software or Tool**

![Bar chart showing annual cost to organizations.](chart)

The frequency of tool and/or data use is shown in Figure 10. Only respondents using commercial for-pay software reported daily usage for a significant proportion of users—15%. All the tools included in this survey are used most often by respondents less than once per month. For example, nearly half of respondents reported using SWAP, SOCRATES, BLS data, or another tool less than once a month. Of respondents who use the Labor
Availability Estimator, Texas CARES, or TRACER, about one-third report using these tools less than once a month.

**Figure 10. Frequency of Tool and/or Data Use**

**Figure 11. Tool is Used in Estimating Labor Supply, Demand, or Both**
When respondents were asked whether they use a tool or data for labor supply, labor demand, or both, the majority of respondents indicated that they use tools for both, as shown in Figure 11. About one-fifth to one quarter of respondents use the tool and/or data for labor demand estimation, and a smaller percentage report using the tools only for labor supply estimation.

Survey respondents were asked to rate each tool’s performance in the following areas: ease of use, breadth of applications, ability to make short- (1-5 years) or long-term (5+ years) projections, ability to make regional or local estimates, and the ability to determine labor supply and compare that to labor demand going forward. They were asked to use a 4-point scale with 1=unsatisfactory and 4=excellent. The findings from this question are shown in Figure 12. The sum of these average ratings across all areas should
be a good proxy for the quality of a tool overall from the users’ perspective. The minimum total score is seven (a rating of 1 across all areas), and the maximum total score is 28 (a rating of 4 across all areas). However, the actual sum across all areas ranged from a low of 17.9 for commercial for-pay software to a high of 20.6 for U.S. BLS forecasts and data. Given that these averages are closer to the maximum than the minimum, the assessment of all the tools can be considered moderately positive. However, the small differences between tools are not likely to be statistically different from one another, making it difficult to draw any conclusions about comparative tool quality from responses to this particular question.

Table 1. Type of Information Received from a Tool/Data Source and Its Usefulness

<table>
<thead>
<tr>
<th>Scale is:</th>
<th>AVERAGE VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>5=very useful</td>
<td>4=somewhat useful, 3=not very useful, 2=not at all useful, and 1=I don’t receive this information</td>
</tr>
<tr>
<td></td>
<td>Commercial software</td>
</tr>
<tr>
<td>Information about growing/declining occupations in my region</td>
<td>1.8</td>
</tr>
<tr>
<td>Information about growing/declining occupations in Texas</td>
<td>2.2</td>
</tr>
<tr>
<td>Information about employers that are hiring in my region</td>
<td>2.1</td>
</tr>
<tr>
<td>Information about employers that are hiring in my city</td>
<td>2.3</td>
</tr>
<tr>
<td>Information about a need for new or revised student programs to meet employer demand</td>
<td>2.5</td>
</tr>
<tr>
<td>Total of Averages</td>
<td>10.8</td>
</tr>
</tbody>
</table>
Tool users were also asked to evaluate the type of information received from tools and/or data and its usefulness. Table 1 reports the average value for five different types of information, where 5=very useful, 4=somewhat useful, 3=not very useful, 2=not at all useful, and 1=I don't receive this information. By summing the average values for each column in Table 1, the overall usefulness as reported by the respondents can be assessed. These sums indicate that respondents find commercial software and SWAP the least useful, with 10.8 and 10.7 total points out of a maximum 25, respectively. Respondents indicated that “another tool” is preferred with 14.4 total points. By summing the average values across each row in Table 1, the usefulness by type of information can be assessed. Respondents indicated that tools and data sources provide little or no useful information about growing/declining labor demand by occupation in their own region. On the other hand, information about a need for new or revised student programs to meet employer demand was the type of information that received the highest utility rating.

As mentioned earlier, only ten respondents indicated that they had never used tools to analyze supply and/or demand for specific types of labor. Further, only eight of the non-users continued to answer questions about non-usage on the survey. The majority of these non-users said that using tools for labor supply/demand analysis is not part of their job. Half of the non-users said that they would be interested in using such tools in the future.
SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this project was to assess the availability of labor supply and demand planning tools currently used in Texas. One major aim was to determine how well these tools effectively anticipate occupational shortages to enable community and technical colleges to plan program offerings that meet the demands for technically skilled graduates in an ever-changing Texas labor force. This report identifies best practices within Texas and from other states that may improve the efficacy of planning programs or anticipating the demand for growing occupations.

SUMMARY OF FINDINGS

Estimating Labor Supply in Texas

Section 3 describes several tools—Labor Availability Estimator (LAE), Applicant Availability Indicator (AAI), State Training Inventory (STI), Strategic Workforce Assessment Program (SWAP), and the Gainful Employment Placement Rates (GEPR)—currently being used to estimate labor supply in Texas and the strengths and weaknesses of each. While each tool provides some information about labor supply in Texas, to obtain a holistic view of labor supply one must rely upon multiple tools. Unfortunately, the data underlying these tools are from two years ago, yielding outdated estimates and making it more difficult for community and technical colleges to respond accurately to any imbalances between supply and demand. Finally, none of the available tools account for worker mobility and migration. While a large-scale labor supply survey accounting for worker mobility and migration could address this gap, the periodic cost of such an effort is difficult to justify and sustain.

Estimating Labor Demand in Texas

Section 4 describes several tools currently being used in Texas to estimate labor demand—SOCRATES, Texas CARES, TRACER, U.S. BLS forecasts and data, and several commercial for-pay software tools. While each of these tools has strengths, none of these tools currently estimate labor demand at the geographic level below that of a WDA. While the WDA-level of geography may work well for smaller WDAs, in larger WDAs both
employers and job seekers may benefit greatly from more fine-grained estimates of labor demand.

In some cases, the data on labor demand for many Texas tools are outdated, requiring job seekers and education and training institutions to use other methods to better ascertain current local demand. For example, Midland College has developed a strategy that involves continuing conversations with local employers for estimating labor demand, as do many other community and technical colleges in Texas. Midland College has taken this one step further by striving to keep those employers that are most actively employing their graduates active on their Advisory Council. This best practice may be helpful to other community and technical colleges within Texas and larger urban areas. Another idea might be to develop an advisory council of employers from the largest industry employers in the area.

Midland College has also established a strategic regional partnership with Odessa College. Administrators from Midland and Odessa Colleges share information about their programs and estimated future demand, and then jointly decide which institution can best serve students in these programs. In this instance, the collaboration coupled with the existing tools provides a better estimate of labor demand given the lag-time common across many demand-planning tools.

**Findings from the Survey of Tool Users in Texas**

Section 5 describes the results from the survey of tool users in Texas. The majority of those surveyed indicated that feedback from employers (91%) and accurate data about the current job openings and labor availability (85%) were the most important factors in making education and training decisions. Three-quarters of respondents (76%) indicated that accurate short-term (1-5 years) predictions regarding job openings and labor availability were also very important. Results also indicated long-term (5+ years) predictions were considered a significant factor (60%). Almost all users (96%) indicated that they would find it useful to have access to pre-generated supply-demand gap analysis reports by region.
Survey respondents named quality data, quality reports, and information gathered from employers as the three most important things for their organization in estimating workforce demand and supply. This finding seems to indicate that the priority should be placed on obtaining quality data and information that can be used to produce reports, but that even quality data cannot replace more up-to-date information to be gathered from employers. While relatively few respondents cited a quality tool as important for estimating labor demand and supply, it is possible that tool users in Texas cannot imagine a tool as comprehensive and timely as Florida’s new system developed by Florida’s Department of Economic Opportunity.

Over two-thirds of respondents report they are using tools and/or data for both labor supply and labor demand purposes. The highest share of tool users (83%) in the survey use U.S. BLS forecasts and data. Despite this, a few respondents wanted BLS data to be easier to use and several noted that data are out of date. There is a possibility that BLS’ name recognition explains some of the reportedly high usage.

Three-quarters of respondents report using one of the four TWC tools asked about in the survey. Respondents indicated that county-level data would be useful for non-MSA cities. Another said, “It is just not as thorough as EMSI Analyst.” Tool and data users are often not sophisticated statisticians. As one respondent pointed out, “As an economic developer in a small community, we do not have the data research experience or resources. When developing new tools it would be nice if they were developed with the non-data research person in mind.” This theme was echoed by a workforce development expert we interviewed who noted in an email, “Supply and demand analysis is a technical foray within the discipline of regional economic analysis that is often abused by those without appropriate background...for those without any technical or academic background or understanding, but tasked to determine, defend or promote education program investments, I’d want the tools that I use, and the outputs thereof, to be as simple as possible.”

Forty percent of respondents reported using SWAP, and, while a few respondents cite its benefits—e.g., facilitates analysis of occupational/industry clusters—most respondents preferred other TWC tools, and a few said rural communities “have no
representation” in the data. Outdated data was cited by SWAP users as one of the tool’s drawbacks.

Although commercial tools are only used by one-third of respondents, they are more frequently used than the other tools, which are generally used less than once a month. Given that 30% of respondents are paying between $5,000 and $15,000 annually for commercial tools, it is not surprising that these tools are being used more frequently. Economic Modeling Specialists International (EMSI) is used by the majority of respondents using a commercial tool. Respondents liked that “data can be gathered to the zip code level which helps pinpoint individual neighborhoods for services.” Another respondent noted that EMSI could have “more predictive abilities,” while others called the tool “superb” and cited “ease of use, great design, and canned reports at the click of a button.” One respondent wrote a detailed description of EMSI:

“I find it useful that the tool is customized to provide projections and labor market information for our local and regional needs. I would like the tool to provide comparative state and national data for each specific search to provide context. I appreciate that the tool provides current number employed in field, estimated annual job openings, estimated number approaching retirement, and wage information at entry/mid/top of field. I would like for the tool to provide a report listing the top 10 to 25 occupations that are growing in the region/state and that are declining” (Anonymous survey respondent).

An essential takeaway of the survey was that nearly all respondents (96%) indicated that they would find it useful to have access to pre-generated supply/demand gap analysis reports by region. This demonstrates that Texans who rely on labor data to make business and policy decisions would like to have additional information to make the best possible decisions.

**RECOMMENDATIONS**

Although estimating labor supply and demand is difficult and complicated by many factors, one important point noted by at least two workforce development experts is that
the majority of the labor market is functioning smoothly and easily. That is, the majority of labor supplied meets the needs of employers, while the majority of labor demands are met through incumbent workers, dislocated workers or recent graduates. It is only at the margins of the labor market that skill shortages and skill mismatches tend to occur. It is at the margin, however, that significant advancements are being made in state efforts to track this data. The current national best practice is Florida’s new Occupational Supply/Demand System. In Florida, regional WIBs were supposed to be training for jobs in demand, but when the great recession hit, healthcare was the only growing industry. The impetus for Florida developing its system was to be able to show that job churning still led to significant labor demand for businesses that were hiring and losing workers.

The in-depth interviews conducted with workforce development experts in Texas and nationally, in conjunction with the inventory of currently used tools in Texas and the survey of tool users, lead to a number of conclusions and recommendations for consideration. Other than Florida’s Occupational Supply/Demand System, Texas’ resources and approaches for estimating predicting labor demand and supply are well ahead of most other states, according to our review of other states’ best practices. Given this, Texas may want to consider a two-pronged approach to improving labor supply and demand estimates. On the one hand, workforce development experts can benefit from sharing lessons learned within Texas from one WDA to another and from one Community College to another. On the other hand, survey results indicate demand for a system to estimate labor supply and demand at the state, regional, and local level with real-time, short-term, and long-term up-to-date estimates. In conclusion, we provide recommendations for both of these two prongs.

In the course of this project, several best practices that may benefit others within Texas were identified:

- Continuous contact with employers is a critical piece in developing accurate labor supply and demand estimates. In-person or through surveys, employers have a crucial role to play in estimating skill shortages and skill mismatches. While it is common for community colleges to rely on Advisory Committees of local employers, Midland College systematically changes their Committee to keep the connection between
hiring (supply) and skills needed (demand) current. This process combines quantitative and qualitative assessments to ensure that the employers consulted provide the most valuable perspectives to the College and its students.

- Information obtained from job seekers (e.g., training enrollees, graduates, employees seeking new skills) is also critical to estimating labor supply by occupation.

- Collaboration is a valuable way to allocate scarce resources efficiently across more than one community college. That is, program development should always be considered in concert with other local colleges.

- A systematic process for developing new training programs can ensure participation by both employers and potential enrollees and aid large campuses considering many new programs simultaneously. For example, the Lone Star College System has a 10-step process for developing new for-credit programs in 12 months or fast-tracking program development in as little as three months.

- Midland College identified several strategies for operating cyclically. During recessionary periods, program development emphasizes longer-term, daytime training programs as layoffs occur. As the oil and gas industry is booming now and the unemployment rate is 2.1%, no one is available for daytime training courses. Therefore, Midland College is currently investing in building capacity for training programs with expensive equipment needs (i.e., truck driver simulators) and is working with the Mexican Consulate to recruit workers for the service industry where there is a shortage of workers.

Whether or not Texas elects to embark on enhancing or updating its current labor demand and supply estimation tools, the above recommendations remain useful. Even with an all-encompassing system like Florida has, Texas’ best practices would continue to apply. Texas is poised to consider whether now may be the right time to embark on building a comprehensive system similar to Florida’s. TWIC may want to consider the following issues and recommendations when determining whether to move forward with such a system:

- This project is an important first step in customer outreach. Estimating what “customers” in Texas currently have and what they want are essential steps in developing a useful tool. Continual customer outreach—to schools, employers, job seekers, and economic developers—is a crucial step in ensuring that the system will be used by those for which it is intended.
The survey of tool users captured both tool users who possess highly skilled data research skills and those who do not have data research experience or resources. Therefore, any statewide tool should clearly state the data caveats and limitations of underlying data so the lay user has a foundation for use of the tool.

While Florida’s system was implemented with a $1 million WDQI grant, a similar system in Texas is likely to be much less expensive to implement. There are lessons learned from Florida that will provide cost savings.

An important selling point for Texas is that a system like Florida’s can be used by economic developers to provide the most comprehensive and timely occupational data to support future business recruitment.

Another selling point is that students (both two-year and four-year) would benefit from having real-time information on current jobs in demand and future projections of the labor market. TWC has worked with THECB to develop Texas CREWS (Consumer Resource for Education and Workforce Statistics), an interactive dashboard designed to provide information to parents, students, school counselors, and others about outcomes from postsecondary education and workforce training programs in Texas. Implementing a model such as Florida’s would permit a cost/benefit analysis for students/parents to understand the investments they are making in education and student loans.

**Next Steps**

Moving forward from this project, there are several next steps TWIC may want to consider.

- To disseminate the best practices identified in this report, TWIC may want to release the Executive Summary from this report to key workforce development stakeholders and experts within Texas to validate the results, elicit their feedback, and stimulate their engagement.

- Additionally, dissemination through oral presentations to key business and industry groups would continue the open communication on this topic, perhaps even gather more information, and buy-in for taking future steps.

Should TWIC decide to support building a system like Florida’s in Texas, information gathering and consensus building around the value of developing a labor supply and demand system similar to the one in Florida are key next steps in determining whether this is politically and financially feasible in Texas. TWIC may want to consider the following next steps to gather information and moving towards a consensus:
Detailed information about the development of Florida’s system could be gathered. TWIC may want to gather in-depth information about building the technological infrastructure, the sources of data, the key stakeholders, and lessons learned and significant barriers encountered.

TWIC may want to gather detailed information on the costs of developing a similar system in Texas. A breakdown of costs by key features could lead to cost savings in Texas that were not possible in Florida.

TWIC may want to build consensus among key stakeholders such as TWC and THECB. Both these entities are deeply involved in assessing labor supply and demand and would be valuable, and perhaps necessary, partners going forward. Through a WDQI grant from the U.S. DOL’s Employment and Training Administration, TWC was able to enhance coordination between TEA, THECB, and TWC for the Automated Student and Adult Learner Follow-Up System mandated by SB281.

Simultaneously, TWIC may want to conduct further outreach to those WDAs less represented in the survey—primarily border communities and rural WDAs. In-person meetings with key stakeholders located around the state would bring a deeper and broader range of information about what is desired and needed in labor supply and demand planning tools.

Similarly, a key stakeholder in developing a Texas labor supply and demand system would be economic developers. Given the value in the system’s ability to recruit businesses, building consensus among this group will be instrumental to the success of this initiative.

Texas would benefit from including 2-year and 4-year colleges as stakeholders early on. Another key feature of Florida’s tool is the ability of student and their parents to determine the value of their education, especially given student loan costs.

Finally, financial feasibility of such a system should be explored. Determining whether and how such a system could be paid for is a key next step for TWIC to consider.
BIBLIOGRAPHY


# APPENDIX A-1. ANNOTATED CATALOGUE OF TEXAS TOOLS

<table>
<thead>
<tr>
<th>Tool</th>
<th>Description</th>
<th>Agency</th>
<th>Data source(s)</th>
<th>Intended Audience(s)</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicant Availability Indicator (AAI)</td>
<td>&quot;The Applicant Availability Indicator helps estimate the available supply of appropriately skilled applicants in a region.” It is one of the 20 modules in Texas Industry Profiles.</td>
<td>TWC/LMCI</td>
<td>TWC Data</td>
<td>Business &amp; Industry</td>
<td>Data on potential applicants disaggregated by industry / occupation</td>
<td>Unsure how applicants are being calculated</td>
</tr>
<tr>
<td>Detailed Work Activities (DWAs)</td>
<td>&quot;To create a universal skill transferability system” by introducing a common language for labor preparation and exchange.</td>
<td>TWC/LMCI</td>
<td>TWC Data</td>
<td>Education &amp; Training providers</td>
<td>Focus on connection between actual work activities and required skills that must be developed by education &amp; training programs</td>
<td>Not at stage of &quot;tool&quot; yet, unsure what use of information is at this time</td>
</tr>
<tr>
<td>Labor Availability Estimator (LAE)</td>
<td>&quot;The Labor Availability Estimator helps estimate the available supply of appropriately skilled workers in a region.” It is one of the 20 modules in Texas Industry Profiles.</td>
<td>TWC/LMCI</td>
<td>TWC Data</td>
<td>Business &amp; Industry</td>
<td>Data on supply of individuals suitable to industry/occupation</td>
<td>Difficult to navigate, industries are broad and include multiple distinct occupations</td>
</tr>
<tr>
<td>SitesOn Texas</td>
<td>&quot;A geographic mapping technology that allows workforce and economic development professionals to effectively plan for business expansion, job retention, and workforce training.&quot;</td>
<td>TWC</td>
<td>U.S. Census Bureau, Geographic, Dun &amp; Bradstreet Business Data, QCEW, Texas LMCI</td>
<td>Economic Development and Business &amp; Industry</td>
<td>Only tool that has Geographic Information Systems (GIS) mapping functions built into tool. Data come from a variety of sources are available at zip code or census tract level</td>
<td>Tool costs $2,995 to use and may therefore not be accessible to particular constituents</td>
</tr>
<tr>
<td>Standardized Occupational Components for Research and Analysis of</td>
<td>&quot;SOCRATES software is designed as a tool to assist local Texas planners perform a regional labor market analysis. SOCRATES is useful for local</td>
<td>TWC/LMCI</td>
<td>TWC Data</td>
<td>Local Texas planners</td>
<td>Simple design; includes job description, educational requirements, and work activities for occupations; includes data on</td>
<td>Does not account for new jobs very well</td>
</tr>
</tbody>
</table>

Note: All citations shown in quotes above are taken verbatim from each tool's website.
<table>
<thead>
<tr>
<th>Tool</th>
<th>Description</th>
<th>Agency</th>
<th>Data source(s)</th>
<th>Intended Audience(s)</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trends in Employment System (SOCRATES)</td>
<td>workforce planning under the Workforce Investment Act (WIA) to generate lists of Targeted Industries and Targeted Occupations. SOCRATES has six unique modules</td>
<td></td>
<td></td>
<td></td>
<td>employment trends and earnings</td>
<td></td>
</tr>
<tr>
<td>State Training Inventory (STI)</td>
<td>&quot;The State Training Inventory (STI) is a compilation of Texas education and workforce training providers, their programs, contact information, labor market information, enrollment and graduation data where available. Education and training providers can be public, private and proprietary institutions.&quot;</td>
<td>TWC/LMCI</td>
<td>TWC, THECB, IPEDS</td>
<td>Employers, workforce planners, students, public</td>
<td>Geared toward multiple audiences, integrates data from multiple sources, good design, can finding programs geared toward specific occupations</td>
<td>List of occupations is long and difficult to navigate,</td>
</tr>
<tr>
<td>Strategic Workforce Assessment Program (SWAP)</td>
<td>&quot;SWAP is designed to simplify the complex challenge of identifying the necessary skills and training programs related to any industry cluster or sector. By answering a few key questions about your customized needs, SWAP organizes and analyzes labor market data to help assess education and employment prospects.&quot;</td>
<td>TWC/LMCI</td>
<td>TWC Data</td>
<td>Individuals/education &amp; training organizations</td>
<td>Simple design, can search by industry or occupation, includes information on skill requirements and specific degree programs aligned with occupations, facilitates analysis of occupational/industry clusters, creates linkages between various different databases, projections of job openings by educational achievement</td>
<td>Somewhat difficult to navigate, Rural Texas communities have no representation, very little accurate information is available at a local level, &quot;Total Graduates by Occupational Area&quot; data is outdated</td>
</tr>
<tr>
<td>Texas CARES</td>
<td>Texas CARES is a system that is designed for individuals to explore different careers and related educational</td>
<td>TWC/LMCI</td>
<td>TWC Data</td>
<td>Individuals</td>
<td>Has information on growing occupations and those with the most openings, also provides</td>
<td>Difficult to navigate, unclear purpose</td>
</tr>
</tbody>
</table>

Note: All citations shown in quotes above are taken verbatim from each tool's website.
### TEXAS -- SYSTEM TOOLS

<table>
<thead>
<tr>
<th>Tool</th>
<th>Description</th>
<th>Agency</th>
<th>Data source(s)</th>
<th>Intended Audience(s)</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texas CREWS</td>
<td>An interactive dashboard tool that provides comparative information on the averages wages and loan levels for educational programs at 2-year and 4-year postsecondary institutions in the state.</td>
<td>THECB</td>
<td>TWC &amp; THECB Data</td>
<td>Students</td>
<td>The tool is fairly easy to navigate and provides important comparative information on the average economic benefits of educational pathways</td>
<td>The tool does not always function properly and the earnings estimates may be biased by the lack of out-of-state data</td>
</tr>
<tr>
<td>Texas Rapid Access to Career and Economic Services (TRACER)</td>
<td>The LMCI homepage for a variety of separate tools and data sources for economic development.</td>
<td>TWC/LMCI</td>
<td>TWC Data</td>
<td>Government / state agencies, education &amp; training organizations</td>
<td>Employment data are comprehensive, includes section on employment projections through 2020</td>
<td>Difficult to navigate, occupation projections contain information on level of education needed but not specific degrees / programs</td>
</tr>
</tbody>
</table>

### TEXAS -- PROGRAM TOOLS

<table>
<thead>
<tr>
<th>Tool</th>
<th>Description</th>
<th>Agency</th>
<th>Data source(s)</th>
<th>Intended Audience(s)</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gainful Employment - Placement Rates</td>
<td>&quot;The information disclosed include list of occupations that the program prepares students to enter, on-time graduation rate for students completing the program, tuition and fees, cost of books and supplies, median loan debt incurred by students who completed the program, and job placement rate for students completing the program.&quot;</td>
<td>THECB</td>
<td>THECB, TWC</td>
<td>Postsecondary institutions</td>
<td>Employment outcomes by institution, major, and level of degree</td>
<td>Missing data</td>
</tr>
</tbody>
</table>

Note: All citations shown in quotes above are taken verbatim from each tool's website.
### METHODOLOGY

The number of applicants available for each occupation is calculated as the number of individuals in the region who have applied for Unemployment Insurance (UI) and/or other services through the Texas Workforce Commission. The transaction counts are based on the applicant’s occupation at last employment or prior occupational experience. An applicant may be counted in more than one occupation based on expressed prior experience.

Detailed work activities are statements about the specific tasks, roles, assignments, and job duties that are required of a specific occupation. DWAs are determined by surveying employers regarding the activities that employees in specific occupations are required to perform and the ranked importance of these activities. These employer responses are then aggregated to the occupational level to arrive at a ranked list of the DWAs required of different occupations.

The LAE uses four data points to estimate labor availability. The first is the number of individuals that are currently working in that occupation. The second is the number of individuals who applied for UI benefits or other assistance from the Texas Workforce Commission (TWC) who were last employed in the listed occupation. The third is a calculation of the number of individuals who graduated from an educational program in the region qualifying them to work in the occupation. These data can also be broken down by educational institutions to allow the user to determine what institutions are providing education and training programs connected with the occupation and the number of individuals that graduate annually from each program. The final data element is an estimate of the number of individuals in related employment.

The Sites on Texas tools allows the user to generate maps based on a variety of data sources. After selecting a geographical region, the user selects the data that they would like to be integrated into the map and the map is then generated.

SOCRATES generates occupational profiles by integrating a variety of data sources and descriptions of the occupation. After selecting a region of the state and an occupation, the tool produces a description of the occupation which includes the number of individuals working in that occupation, the projected growth of the occupation over the next decade (drawn from the BLS 10-year projections), the mean wage (drawn from TWC's UI data), and some demographic characteristics of employees in the occupation.

<table>
<thead>
<tr>
<th>TEXAS -- SYSTEM TOOLS</th>
<th>COMMON ELEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Employment Dynamics</td>
<td>X</td>
</tr>
<tr>
<td>Occupational Profiles</td>
<td>X</td>
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<tr>
<td>Texas Labor Projections</td>
<td>X</td>
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<tr>
<td>County Narrative Profiles</td>
<td>X</td>
</tr>
<tr>
<td>Industry Cluster</td>
<td>X</td>
</tr>
<tr>
<td>School &amp; Program Information</td>
<td>X</td>
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</tbody>
</table>

Note: All citations shown in quotes above are taken verbatim from each tool's website.
<table>
<thead>
<tr>
<th>TEXAS -- SYSTEM TOOLS</th>
<th>COMMON ELEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>METHODOLOGY</strong></td>
<td>Local Employment Dynamics</td>
</tr>
<tr>
<td>The State Training Inventory calculates the supply of workers as defined by recent graduates or current enrollees of formal educational and training programs. Individuals are classified according to the Classification of Instructional Programs (CIP) scheme, which categorizes students based on the subject or major of their educational program, and the credential they are pursuing or have completed (certificate, associate's, bachelor's, etc.).</td>
<td></td>
</tr>
<tr>
<td>SWAP calculates the number of individuals employed in occupations based on SOC title. Estimates can be generated for either the entire state or particular workforce regions. SWAP also provides estimates of trends in job growth/loss based on the BLS 10-year projections. Data on the number of jobs added through job growth and through replacement are also provided, and these data points produce an estimate of the growth-to-replacement ratio. Data on occupational demand are provided by the number of Help Wanted ads for the occupation in the latest quarter.</td>
<td></td>
</tr>
<tr>
<td>Texas CARES integrates TWC data to produce short lists of the most desirable occupations, such as those with the highest rates of job growth, those with the most openings, and those adding the most jobs.</td>
<td>X</td>
</tr>
<tr>
<td>Texas CREWS integrates THECB and TWC data to produce estimates of the economic benefits of educational and training programs. Data on graduates from educational programs is linked with TWC data on the wages of graduates in order to calculate the average earnings of graduates from different degree and certificate programs. Both statewide estimates and averages for the programs at specific institutions can be calculated. The tool also provides data on the average loan levels of graduates of specific programs.</td>
<td></td>
</tr>
<tr>
<td>TRACER is a homepage that provides access to various tools and data sources, each with their own separate methodology.</td>
<td>X</td>
</tr>
</tbody>
</table>

Note: All citations shown in quotes above are taken verbatim from each tool’s website.
This tool integrates postsecondary completion data from the THECB with employment and UI wage data from the TWC. This allows for the calculation of employment rates and wages by major, degree program, and institution. Cohorts are defined as all students that graduated in a particular academic year, and individuals are counted as employed if they are found working in the 4th quarter of the academic year in which they graduate. Graduates that re-enroll in postsecondary or serve in the military are excluded from the calculations.

<table>
<thead>
<tr>
<th>TEXAS -- PROGRAM TOOLS</th>
<th>COMMON ELEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Employment</td>
<td></td>
</tr>
<tr>
<td>Dynamics</td>
<td>Occupational</td>
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<tr>
<td></td>
<td>Profiles</td>
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<td></td>
<td>Texas Labor</td>
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<td>Projections</td>
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<td>County Narrative</td>
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<td>Profiles</td>
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<td>Industry Cluster</td>
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<tr>
<td>School &amp; Program</td>
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<tr>
<td>Information</td>
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Note: All citations shown in quotes above are taken verbatim from each tool’s website.
# APPENDIX A-2. ANNOTATED CATALOGUE OF NATIONAL TOOLS

<table>
<thead>
<tr>
<th>NATIONAL -- PROGRAM TOOLS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tool</strong></td>
</tr>
<tr>
<td>Burning Glass</td>
</tr>
<tr>
<td>Demographics Now</td>
</tr>
<tr>
<td>Economic Modeling Specialists International (EMSI)</td>
</tr>
<tr>
<td>GradCast</td>
</tr>
<tr>
<td>U.S. Bureau of Labor Statistics (BLS) Forecasts and/or Data</td>
</tr>
<tr>
<td>U.S. Census Bureau’s OnTheMap</td>
</tr>
</tbody>
</table>

Note: All citations shown in quotes above are taken verbatim from each tool’s website.
### NATIONAL -- PROGRAM TOOLS

<table>
<thead>
<tr>
<th>Tool</th>
<th>Description</th>
<th>Agency</th>
<th>Data source(s)</th>
<th>Intended Audience(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupational Outlook Handbook (OOH)</td>
<td>&quot;This is a guide to career information about hundreds of occupations.&quot;</td>
<td>U.S. Department of Labor</td>
<td>BLS</td>
<td>Economic Development and Job Seekers</td>
</tr>
<tr>
<td>PCensus AGS Data</td>
<td>&quot;The estimates and projections database includes a wide range of core demographic variables for the current year and 5-year projections, covering five broad topic areas: population, households, income, labor force, and dwellings. With a foundation of the Experian household-level databases and over fifteen years of experience in demographic forecasting, AGS offers the highest quality demographic estimates in the marketplace today.&quot;</td>
<td>PCensus AGS</td>
<td>U.S. Census Bureau, BLS, IRS, Experian's INSOURCE database</td>
<td>Business &amp; Industry and Postsecondary Institutions</td>
</tr>
<tr>
<td>WANTED Analytics™</td>
<td>&quot;WANTED Analytics™ combines real-time business intelligence with years of hiring demand and talent supply data to help make better strategic business decisions.&quot;</td>
<td>Wanted Analytics</td>
<td>Job Vacancy and Job Seeker Profile Data</td>
<td>HR Professionals in Business &amp; Industry</td>
</tr>
</tbody>
</table>

### Strengths

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Burning Glass</strong> data provide an up-to-date picture of occupational demand, and BG algorithms mine vacancy listings to populate 70 data fields such as industry, occupation, and skills</td>
<td>All occupations are not equally represented by online vacancies, must pay for data and reports, algorithms used to generate databases are proprietary</td>
<td>Although Burning Glass does not release full details of the algorithms it uses for its labor demand analyses, its methodology generally consists of running online job vacancy postings through a computer program which extracts relevant information about the position, such as occupational titles, educational background, and skill requirements, then aggregating the information it generates. This results in estimates of the occupations and skills that are most in demand in a particular region.</td>
</tr>
<tr>
<td><strong>Demographics NOW</strong> is suited for geographical mapping of data and can provide an in-depth picture of demographic makeup of community</td>
<td>Tool is not designed for labor supply and demand planning</td>
<td>This tool uses Geographic Information Systems technology to produce maps based on a variety of demographic data. The specific methodologies used to create the maps are not disclosed by the creators of the tool.</td>
</tr>
<tr>
<td><strong>EMSI</strong> collects and integrates data from a variety of sources, many of which are available at the local level, providing an in-depth picture of demographic makeup of community</td>
<td>Job vacancy data is relatively preliminary for EMSI and long-term projections of occupational change are</td>
<td>Although EMSI produces a variety of tools, each with its own methodology, the most relevant to the current study is the Gap Analysis. The Gap Analysis integrates data from the BLS on current and projected labor demand with labor supply data provided by IPEDS (i.e., graduates by educational program) in order to identify growing occupations</td>
</tr>
</tbody>
</table>

Note: All citations shown in quotes above are taken verbatim from each tool’s website.
<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>depth picture of the economic conditions of a community</td>
<td>simply drawn from BLS projections</td>
<td>in which the community or technical college is not currently supplying a sufficient number of workers. The tool includes data on other community and technical college graduates in the region to contextualize the program offerings of the institution. EMSI does not disclose specific details of the methodology, however.</td>
</tr>
<tr>
<td>GradCast allows postsecondary institutions to track the employment outcomes of their graduates</td>
<td>Unclear what percentage of students GradCast is able to follow and what data are collected</td>
<td>This tool provides access to job openings that are posted by employers. It is unclear if the job postings are aggregated or analyzed in any way and, if so, what methodology is used.</td>
</tr>
<tr>
<td>U.S. BLS projections are based on an extensive amount of long-term data and are generally accurate at the occupational group level</td>
<td>Projections are less accurate for specific occupations, are based on a number of important macroeconomic assumptions, and are not available at the local level</td>
<td>The BLS projections are based on statistical modeling techniques that make a number of assumptions about the current and future state of the US economy, such as a full-employment economy and market clearing. The projections begin by forecasting the overall growth of the economy, then estimating the growth in the mix of industries in the economy, and finally predicting the growth or decline of various occupations that constitute those industries. The projections also forecast labor supply, including labor force levels and participation rates, by analyzing trends and projections in Census data.</td>
</tr>
<tr>
<td>OnTheMap allows for simple creation of maps with industry and employment data</td>
<td>No occupational data and the data are often as much as three years old</td>
<td>The OnTheMap tool uses Geographic Information Systems technology to produce maps based on data from the Census' Longitudinal Employer-Household Dynamics (LEHD) data. The tool aggregates demographic and employment data to various geographic levels, such as state, county, and census tract. This allows for visual representations of data such as the number of individuals that earn above a certain threshold and the number employed in particular industries.</td>
</tr>
<tr>
<td>Occupational Outlook Handbook (OOH) is easily accessible, data on fastest growing occupations</td>
<td>No link between occupational demand and education / training requirements</td>
<td>The OOH calculates the percentage change in occupations, defined by SOC codes, over a given time period. This allows for the identification of quickly growing occupations.</td>
</tr>
<tr>
<td>PCensus AGS tool helps institutions analyze the local community and identify optimal locations for expansion</td>
<td>The tool is designed primarily for marketing and demographic analysis rather than labor supply and demand planning</td>
<td>This tool uses Census data to produce estimates of the current and projected demographic composition of localities. Estimates and projections of employment by industry and occupation are drawn from the BLS long-term projections.</td>
</tr>
<tr>
<td>WANTED Analytics™ is unique because it has: salary distributions for occupations, employer demand for skills and certifications, and &quot;heat maps&quot; showing geographic density of postings</td>
<td>The labor supply data is estimated from the Occupational Employment Survey, rather than actual Census-like data, and is somewhat dated.</td>
<td>This tool integrates real-time data on labor demand from online job postings with labor supply data from job-seekers who have submitted resumes or job applications online by aggregating data from a variety of sources. This allows companies to determine the types of positions that other companies are looking to fill and the potential difficulty of filling a specific vacancy based on the overall demand and the available supply of qualified job-seekers. WANTED Analytics does not disclose the specific methodology it uses to produce these estimates.</td>
</tr>
</tbody>
</table>

Note: All citations shown in quotes above are taken verbatim from each tool's website.
<table>
<thead>
<tr>
<th>Tool</th>
<th>Description</th>
<th>Agency</th>
<th>Data source(s)</th>
<th>Intended Audience(s)</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Florida LMI</td>
<td>&quot;Labor Market Statistics Center's mission is to produce, analyze, and deliver timely and reliable labor statistics to improve economic decision-making.&quot;</td>
<td>Florida Dept. of Economic Opportunity</td>
<td>Florida Workforce Commission, Florida College and University Systems, Conference Board Online Vacancy Data, FETPET</td>
<td>Job Seekers, Community Planners, Businesses, Employers and workforce professionals</td>
<td>Tool integrates supply and demand data at the local level to provide snapshots of labor shortages and surpluses for specific occupations</td>
<td>University graduates are not included in local estimates of labor supply which may underestimate supply, and short-term demand data drawn from online postings may exclude low-skill jobs</td>
</tr>
<tr>
<td>Kentucky LMI</td>
<td>&quot;The Research and Statistics Branch is a section of the Office of Employment and Training. We collect and disseminate data pertaining to employment, wages, occupations, unemployment insurance, mass layoff statistics, in addition to other data and publications.&quot;</td>
<td>KYLMI</td>
<td>OES survey of approx. 20,000 Kentucky employers / CES / QCEW</td>
<td>Job seekers, students, employers, training providers, workforce professionals, and others seeking to explore local labor markets.</td>
<td>Easy to navigate, well-done graphics, clearly listed information</td>
<td>It is not always clear where some of the data/projections are being drawn from, and data are not available for certain occupations</td>
</tr>
<tr>
<td>Virginia LMI</td>
<td>&quot;This system provides fast access to a complete set of employment tools in one web site.&quot;</td>
<td>Virginia LMI</td>
<td>Virginia Employment Commission / QCEW / LED</td>
<td>Job seekers, students, employers, training providers, workforce professionals, and others seeking to explore local labor markets</td>
<td>User friendly, offer comparisons within the state, across states and nationally, detailed narratives, graphs, detailed job experience/education required</td>
<td>Information is not up-to-date</td>
</tr>
</tbody>
</table>
APPENDIX B. SURVEY INSTRUMENT

ESTIMATING LABOR DEMAND AND SUPPLY IN TEXAS

In this survey, the following definitions apply:

**Supply** – workers available to fill a job opening that requires a specific skill set. Most commonly, this would refer to people currently in or recently graduated from education or training preparing them for that position.

**Demand** – jobs/positions either open or soon to be, that will require a specific training or set of skills.

**Estimates** – data compiled using sampling methods that provide a reasonable, though not necessarily exact, figure of current numbers.

**Projections** – attempts to combine knowledge of historical trends, current estimates, and available information to produce a range of likely outcomes for a given figure (either supply or demand) in the future.

1. Please select the organization(s) that best describes your affiliation *(Please select only one)*
   a. Community College
   b. Technical College
   c. Texas Workforce Development Board
   d. Economic Development
   e. Business/Industry Association
   f. Other *(Please specify)*

2. Which of the following best describes the type of work that you do *(Please select only one)*
   a. Business owner
   b. Institutional Researcher
   c. Administrator
   d. Industry Representative
   e. Recruiter
   f. Other *(Please specify)*

3. Please select the county you work in from the drop down menu. [SELECT TEXAS COUNTY]

4. How often do you use tools to examine data that assesses either the supply of or demand for specific types of labor?
   a. Frequently
   b. Occasionally
   c. I do not use them now, but have in the past
Section 1 – All Respondents

5. Do you believe that being able to analyze differences between the number of workers currently available in a region and available job openings in that region would be valuable to your organization?
   a. Yes
   b. No

6. Do you believe that being able to analyze differences between the number of potential future workers available in the region and projected available job openings in that region would be valuable to your organization?
   a. Yes
   b. No

7. Do you believe that you currently have a satisfactory picture of trends in the supply of graduates and other potential workers to plan for your organization’s future?
   a. Yes
   b. No [SKIP TO Q9]

8. What methods do you use to gather this information about labor supply? (Please select all that apply)
   a. Quantitative labor market data gathered and analyzed by your organization
   b. Reports on quantitative labor market data gathered and analyzed by an outside organization/consultant
   c. Formal or informal information gathering with students
   d. Formal or informal information gathering with faculty
   e. Formal or informal information gathering with employers
   f. Other (Please specify)________________________________________

9. Do you believe that you currently have a satisfactory picture of trends in the changes in demand for workers to plan for your organization’s future?
   a. Yes
   b. No [SKIP TO Q11]

10. What methods do you use to gather this information about labor demand? (Please select all that apply)
    a. Quantitative labor market data gathered and analyzed by your organization
    b. Reports on quantitative labor market data gathered and analyzed by an outside organization/consultant
    c. Formal or informal information gathering with graduates and potential workers
    d. Formal or informal information gathering with faculty
    e. Formal or informal information gathering with employers
    f. Other (Please specify)________________________________________
11. Workforce education and training is key to producing a skilled labor force; given that, how important are each of the following factors in making good decisions about workforce education and training?

<table>
<thead>
<tr>
<th>Factor</th>
<th>Very Important</th>
<th>Somewhat Important</th>
<th>Neutral</th>
<th>Not very important</th>
<th>Very Unimportant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accurate data about the current job openings and labor availability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accurate short-term (1-5 years) predictions about job openings and labor availability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accurate long term (5+ years) predictions about job openings and labor availability</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feedback from current employees / students</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feedback from former employees / students</td>
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<td></td>
<td></td>
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<tr>
<td>Feedback from employers</td>
<td></td>
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<tr>
<td>Other (please specify)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

12. What are the top three (3) most important things for your organization in estimating workforce demand and supply? *(Please RANK 1, 2, and 3)*

a. ____A quality tool
b. ____Quality data
c. ____Quality reports
d. ____Well-trained staff
e. ____Formal or informal meetings within our community
f. ____Formal or informal information gathering with students
g. ____Formal or informal information gathering with faculty
h. ____Formal or informal information gathering with employers

13. Would access to raw or excel spreadsheet supply/demand data (that is not in PDF form) improve the ability of your organization to be successful?

a. Yes
b. No

14. Would access to pre-generated supply/demand gap analysis reports by region be useful?

a. Yes
b. No
15. How would you rate the current availability of supply/demand data that can improve your organization’s performance?
   a. Excellent
   b. Good
   c. Fair
   d. Poor
   e. Don’t know

Section 2 – Tool Assessment

16. Do you use commercially provided, for-pay software or a tool to gather labor demand supply information?
   a. Yes
   b. No [SKIP TO Q24]

17. Which commercial for-pay software is your organization using? (Please select all that apply)
   a. Wanted Analytics
   b. Burning Glass
   c. EMSI
   d. Other (Please specify)________________________________________

18. How much does your organization pay for access to this tool or labor market data each year?
   a. We do not pay anything
   b. $1 - $249
   c. $250 - $499
   d. $500 - $999
   e. $1,000 - $1,499
   f. $1,500 - $1,999
   g. $2,000 - $4,999
   h. $5,000 - $9,999
   i. $10,000 - $14,999
   j. $15,000 - $19,999
   k. Over $20,000
   l. Unknown

19. How often do you use this tool?
   a. Daily
   b. At least once a week
   c. At least once a month
   d. Less than once a month, still using
   e. I used this tool in the past, but no longer use it today
20. Do you use this tool or data primarily for labor supply or demand purposes?
   a) Supply  
   b) Demand  
   c) Both

21. Please RATE the tool in how it performs in each of the following areas. (*Please use a scale where 1 = excellent, 2 = good, 3 = satisfactory, 4 = unsatisfactory, and 5 = not applicable*)
   a) ____ Ease of use  
   b) ____ Breadth of applications  
   c) ____ Ability to make short-term (1-5 years) projections  
   d) ____ Ability to make long-term (5+ years) projections  
   e) ____ Ability to make regional estimates  
   f) ____ Ability to make local estimates  
   g) ____ Ability to determine labor supply and compare that to occupational demand for that labor going forward

22. If you would recommend any aspects of this tool as a lesson to someone designing a new tool, positive or negative, please take a moment to share them below.

__________________

23. What types of information do you receive from this data provider or tool and how useful is this information to your work?

<table>
<thead>
<tr>
<th>Information</th>
<th>Very useful</th>
<th>Somewhat useful</th>
<th>Not very useful</th>
<th>Not at all useful</th>
<th>I don’t receive this information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growing/declining occupations in my region</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growing/declining occupations in Texas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employers hiring in my region</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employers hiring in my city</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Need for new or revised student programs to meet employer demand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

24. Do you currently consult *SWAP (Strategic Workforce Assessment Program)* developed by the Texas Workforce Commission, or have you consulted it in the past, for labor market information?
   a. Yes  
   b. No [SKIP TO Q30]

25. How often do you use this tool?
26. Do you use this data primarily for labor supply or demand purposes?
   a. Supply
   b. Demand
   c. Both

27. Please RATE the tool in how it performs in each of the following areas. (*Please use a scale where 1 = excellent, 2 = good, 3 = satisfactory, 4 = unsatisfactory, and 5 = not applicable*)
   a. ___ Ease of use
   b. ___ Breadth of applications
   c. ___ Ability to make short-term (1-5 years) projections
   d. ___ Ability to make long-term (>5 years) projections
   e. ___ Ability to make regional estimates
   f. ___ Ability to make local estimates
   g. ___ Ability to determine labor supply and compare that to occupational demand for that labor going forward

28. If you would recommend any aspects of this tool as a lesson to someone designing a new tool, positive or negative, please take a moment to share them below.
   ___________________

29. What types of information do you receive from this data provider or tool and how useful is this information to your work?

<table>
<thead>
<tr>
<th>Information provided</th>
<th>Very important</th>
<th>Somewhat important</th>
<th>Not very important</th>
<th>Very unimportant</th>
<th>I don’t receive this information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information about growing/declining occupations in my region</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information about growing/declining occupations in Texas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information about employers that are hiring in my region</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information about employers that are hiring in my city</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
30. Do you currently consult, or have you in the past consulted, any of the **following tools from the Texas Workforce Commission for labor market information:**

1. SOCRATES (Standardized Occupational Components for Research and Analysis of Trends in Employment System),
2. Labor Availability Estimator,
3. Texas CARES (Career Alternative Resource Evaluation System), or
4. TRACER (Texas Rapid Access to Career and Economic Services).

   a. Yes  
   b. No [**SKIP TO Q35**]

31. For each tool listed, please indicate (1) how frequently you use it, and (2) what data you use it for.

<table>
<thead>
<tr>
<th>Tool</th>
<th>How frequently?</th>
<th>What data do you use it for?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Daily</td>
<td>Supply Data</td>
</tr>
<tr>
<td>SOCRATES</td>
<td>At least once a</td>
<td>Demand Data</td>
</tr>
<tr>
<td></td>
<td>week</td>
<td>Both Supply &amp; Data</td>
</tr>
<tr>
<td>Labor Availability Estimator</td>
<td>At least once a</td>
<td></td>
</tr>
<tr>
<td>Texas CARES</td>
<td>month</td>
<td></td>
</tr>
<tr>
<td>TRACER</td>
<td>Less than once a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>month</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td></td>
</tr>
</tbody>
</table>

32. Please **RATE** the tool in how it performs in each of the following areas. *(Please use a scale where 1 = excellent, 2 = good, 3 = satisfactory, 4 = unsatisfactory, and 5 = not applicable)*

   a. ____ Ease of use  
   b. ____ Breadth of applications  
   c. ____ Ability to make short-term (1-5 years) projections  
   d. ____ Ability to make long-term (5+ years) projections  
   e. ____ Ability to make regional estimates  
   f. ____ Ability to make local estimates  
   g. ____ Ability to determine labor supply and compare that to occupational demand for that labor going forward
33. If you would recommend any aspects of these tools as lessons to someone designing a new tool, positive or negative, please take a moment to share them below.

34. What types of information do you receive from these tools and how useful is this information to your work?

<table>
<thead>
<tr>
<th>Information</th>
<th>Very useful</th>
<th>Somewhat useful</th>
<th>Not very useful</th>
<th>Not at all useful</th>
<th>I don’t receive this information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information about growing/declining occupations in my region</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information about growing/declining occupations in Texas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information about employers that are hiring in my region</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information about employers that are hiring in my city</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Information about a need for new or revised student programs to meet employer demand</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

35. Do you currently consult **US Bureau Labor Statistics (BLS)** forecasts and/or data or have you consulted BLS in the past for labor market information?
   a. Yes
   b. No [SKIP TO Q41]

36. How often do you use this data?
   a. Daily
   b. At least once a week
   c. At least once a month
   d. Less than once a month, still using
   e. I used this tool in the past, but no longer use it today

37. Do you use this data primarily for labor supply or demand purposes?
   a. Supply
   b. Demand
   c. Both

38. Please RATE this data in how it performs in each of the following areas. *(Please use a scale where 1 = excellent, 2 = good, 3 = satisfactory, 4 = unsatisfactory, and 5 = not applicable)*
   a. ____Ease of use
   b. ____Breadth of applications
   c. ____Ability to make short-term (1-5 years) projections
d. Ability to make long-term (5+ years) projections

e. Ability to make regional estimates

f. Ability to make local estimates

g. Ability to determine labor supply and compare that to occupational demand for that labor going forward

39. If you would recommend any aspects of this tool as a lesson to someone designing a new tool, positive or negative, please take a moment to share them below.

______________

40. What types of information do you receive from this data provider or tool and how useful is this information to your work?

<table>
<thead>
<tr>
<th>Information</th>
<th>Very useful</th>
<th>Somewhat useful</th>
<th>Not very useful</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Information about growing/declining occupations</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>in my region</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Information about growing/declining occupations</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>in Texas</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Information about employers that are hiring</td>
<td></td>
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</tr>
<tr>
<td>in my region</td>
<td></td>
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</tr>
<tr>
<td>Information about employers that are hiring in my</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>city</td>
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</tr>
<tr>
<td>Information about a need for new or revised student</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>programs to meet employer demand</td>
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</tr>
</tbody>
</table>

41. Do you currently consult another tool, including one of in-house design or other data or have you consulted another tool/other data in the past for labor market information?

a. Yes

b. No [SKIP TO Q50]

42. How often do you use this tool/other data?

a. Daily

b. At least once a week

c. At least once a month

d. Less than once a month, still using

e. I used this tool in the past, but no longer use it today

43. Do you use this tool/other data primarily for labor supply or demand purposes?

a. Supply

b. Demand

c. Both
44. Please RATE this tool in how it performs in each of the following areas. *(Please use a scale where 1 = excellent, 2 = good, 3 = satisfactory, 4 = unsatisfactory, and 5 = not applicable)*
   a. ____ Ease of use
   b. ____ Breadth of applications
   c. ____ Ability to make short-term (1-5 years) projections
   d. ____ Ability to make long-term (5+ years) projections
   e. ____ Ability to make regional estimates
   f. ____ Ability to make local estimates
   g. ____ Ability to determine labor supply and compare that to occupational demand for that labor going forward

45. If you would recommend any aspects of this tool as a lesson to someone designing a new tool, positive or negative, please take a moment to share them below.

__________________

46. What types of information do you receive from this data provider or tool and how useful is this information to your work?

<table>
<thead>
<tr>
<th>Information</th>
<th>Very useful</th>
<th>Somewhat useful</th>
<th>Not very useful</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Information about growing/declining occupations in my region</td>
<td></td>
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<td>Information about growing/declining occupations in Texas</td>
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<td>Information about employers that are hiring in my region</td>
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<tr>
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</tr>
</tbody>
</table>

[SKIP TO Q50]

Section 3 – No Tool Experience

47. Why don’t you use tools for labor supply/demand analysis? *(Please select all that apply)*
   a. Difficult to use
   b. Did not trust the underlying data
   c. Too expensive
   d. Inability to make short-term projections
   e. Inability to make long-term projections
f. Inability to make regional estimates
g. Inability to make local estimates
h. Do not consider knowledge of labor/supply demand patterns helpful
i. Do not trust the underlying data
j. Other (Please Specify)________________________

48. Would you be interested in using a tool for analyzing labor supply and/or demand in the future?
   a. Yes
   b. No [SKIP TO Q50]

49. What are the top three (3) most important features for you in selecting that tool?
   (Please RANK 1, 2, and 3)
   a. ____Ease of use
   b. ____Breadth of applications
   c. ____Ability to make short-term projections
   d. ____Ability to make long-term projections
   e. ____Cost
   f. ____Ability to make regional estimates
   g. ____Ability to make local estimates
   h. ____Ability to determine labor supply and compare that to occupational demand for that labor going forward
   [SKIP TO Q51]

Section 4 – Request for final report

50. Are there any other tools that you do not use, but are aware of that you think we should include in our research?
   ___________________________

51. If you would like to receive a link to the final report if it is made publicly available by the Texas Workforce Investment Council, please enter your email address below. This information will not be used or shared with anyone for any other purpose. Email address __________________________

THANK YOU FOR PARTICIPATING IN THIS SURVEY!