

The Future is **Ahead of You**

***Navigating Your Way
to Career Success***

**Career Progressions
for the Workforce Solutions
Rural Capital Area**

The fabled Green Bay Packers football coach, Vince Lombardi, once said, “Individual commitment to a group effort - that is what makes a team work, a company work, a society work, a civilization work.” This Workforce Solutions Rural Capital Area career progressions initiative was possible because of the caliber and efforts of those who committed to its successful execution. This project was fortunate to benefit from the capabilities and labors of many talented and dedicated individuals.

The Workforce Solutions Rural Capital Area staff provided the vision and grant funding that made this project possible. Paul Fletcher, Chief Executive Officer, recognized that one of the best ways to help individuals reach self-sufficiency is to provide encouragement and to help them visualize the upward mobility that is possible from any entry level position. Al Lopez, Chief Operations Officer and eminent labor market practitioner, served as project director and provided clear objectives, a vision for the final project deliverables, and facilitated all aspects of the project. Jenna Akridge, Chief Contracts Officer, contributed in innumerable ways to the quality of the final product with her experienced insight.

This project required a significant amount of data development, synthesis, and innovation to bring the concept of a skill-based career progression lattice to reality. There is no one better at this than John Romanek, whose immense technical talents, labor market expertise, and unending intellectual curiosity to build better products to improve the workforce system are found throughout this work. John continues to make improvements in our methodology and approach from which this project benefitted immensely.

One of the strengths of a project like this is to have front line validation from the regional business community. The interviews in this report were conducted and reported by Mick Normington, an erstwhile business journalist and economic development specialist. Mick has a curiosity for and interest in how business processes are changing and how they affect worker preparation. The stories he relates from eleven Rural Capital Area employers are truly engaging and insightful. Our thanks also to the business leaders that gave freely of their time and perspectives on hiring preferences and expectations. Their insights helped us gauge labor market nuances that can't be discerned through statistical analysis alone.

A special recognition goes out to Michael Betterworth and his team at SkillsEngine, a division of the Center for Employability Outcomes at Texas State Technical College. Michael contributed the SkillsEngine work activities database, including a new skill criticality domain, that markedly improved our ability to rank transferable skills across occupations. The level of practical innovation, creativity and technical prowess from the SkillsEngine team is unsurpassed nationally. We were extremely fortunate and grateful to be able to take advantage of his vision and expertise in the skill alignment arena.

Finally, the effective presentation of content is critical to its application and customer value. For this task, we once again turned to the keen and creative eye of Pun Nio. Pun is much more than a graphic designer. For this project, Pun served as graphic design artist, creativity specialist and offered a gentle editorial hand. We are grateful to have her talents as part of our team.

Project Director and principal investigator Richard Froeschle was responsible for pulling all the pieces together, crafting this final report, and bringing the project expectations to reality. Richard is responsible for the scope and content of this report and any errors of commission or omission in the analysis, synthesis or presentation of materials herein lie with him.

The Future is Ahead of You

Navigating your Way to Career Success

“If you want something you’ve never had, you must be willing to do something you’ve never done.”
Thomas Jefferson

Introduction

The Texas labor market can be a crazy place. Unemployment rates are at a record low, job opportunities are plentiful, and wages are rising; albeit at a slower pace than most economists prophesied at the end of the Great Recession in 2008. So while there appear to be jobs for everyone that wants one, not all of them offer the ability to earn a substantial living. Moreover, the world of work has gotten more complex. There are more opportunities than ever for those that are prepared, and more difficulties for those who are not. In this environment, career decision-making has never been more challenging, nor more important.

At its heart, this project is about understanding the dynamics of career mobility and the importance of a skilled workforce. There are three major labor market actors involved and each has a great deal at stake in the development of a skilled workforce:

1) Individual workers – Although getting a college degree is a noble pursuit, the real goal for most individuals is acquiring the knowledge and skills necessary to secure a well-paying and rewarding career. Setting a career goal, knowing how to get there, and persevering to attainment is the essence of career development. According to the 2017 UCLA freshman study, 84.9 percent of incoming students went to college to get a better job. And once they entered college, 82.5 percent said ‘being well-off financially’ was essential or very important. Many of these students have little labor market understanding and can benefit immensely from the guidance offered through the career progression lattice concept. While there is no such thing as a skill that has no value, some skills have much higher remunerative value than others. More importantly, many of them are just as easily acquired in an affordable Texas Community or Technical College technical training program as at a four-year university.

2) Business Community – In a labor market like the Rural Capital Area with unemployment rates hovering in the 3.0-3.5 percent range, finding workers is a challenge. Finding workers that have the right knowledge and skill match to fit your business model and staffing needs is even more difficult. Thus, the business community has a huge vested interest in helping existing and potential new workers understand the skills in demand and the opportunities available for those “willing to learn the right stuff”. Dallas Federal Reserve economist Christopher Slijk highlighted labor shortage issues in the region when he said, “[w]hile labor tightness is broad based, it has been particularly acute for firms seeking to fill mid-skill positions – those requiring some college or technical training”¹. But defining where those jobs are, and the required skills, requires both labor market study and direct employer input. This career progression lattice project contributes in both these spheres. Hopefully, in turn, students and workers in entry-level positions will see the upwardly mobile opportunities available to them and acquire the necessary skills to match regional labor market demand.

¹ *Austin American Statesman*,
September 22, 2019.

3) Economic Development – There is an axiom in the economic development community that says workforce development IS economic development. This accentuates the importance of a skilled labor force; both for attracting new business to the region and priming the talent pipeline so existing businesses can grow and prosper. Moreover, the more income circulating within a community, the more induced economic activity it generates and the higher the standard of living. A perfunctory economic impact assessment illustrates this point. If just 10 percent of the 84,498 workers currently employed in the twenty entry level or ‘Anchor’ occupations used in this study were to move to Tier I occupations, an additional \$59 million in annual wages would be earned – with the majority of it circulating in the regional economy. Moving that same 10 percent to Tier II occupations would increase total earnings by \$153 million. Clearly, regional economic health rises as workers increase their skill portfolios, and earnings capacity. Career progression lattices articulate upward mobility possibility and jump start that journey to higher skill, higher wage jobs.

This project by Workforce Solutions Rural Capital Area is designed to address the needs of all three actors suggested above. There is a definite need to provide better labor market and career information to guide career decisions of students and workforce participants alike. But often overlooked is how important market-aligned career decision-making is to employers and the community at large.

Why Career Progressions?

The philosophical impetus for increased attention to career progressions comes from two major trends: 1) an apparent misalignment between the skills of available workers and regional labor market demand. This, in turn, is affecting wage growth, workplace satisfaction, labor turnover, talent availability, and extended time to hire; and 2) in a labor shortage environment, getting a first job is not much of a challenge for many people. Ironically, this also diminishes the need for workforce development intermediaries to place people in jobs. This means that workforce boards are paying extra attention to finding workers for their business customers and helping displaced workers move from their entry-level jobs to ones that pay a living wage. This leads to more emphasis on targeted skills training initiatives.

The title of this report, *The Future is Ahead of You*, represents a simple truth about the career development process. Nobody wakes up one day with a job as an Electrical Engineer or a General Manager without investing considerable time, energy, sacrifice, and effort. But navigating one’s way to career success also requires some form of a roadmap and guidance that starts with a career objective or earnings goal, and offers a strategy for where time, effort and financial resources are to be invested to achieve those higher career aspirations. Useful labor market information, including a career progression lattice, and good career decision-making can make the journey easier.

The public education system is increasingly incorporating the concept of career pathways to better align education course-taking with a student’s career objectives and labor market trends. Articulated course work that spans high school and college can lead to less superfluous and costly study² and, more importantly, coursework that moves a student more quickly and seamlessly toward their career objective. Hopefully that objective further aligns with available job opportunities in the region in which one chooses to live - and pay that meets expectations.

² From *College to Jobs: Making Sense of Labor Market Returns to Higher Education*, Thomas Bailey, The Aspen Institute, 2016, p. 27, “As a result, [of uninformed course taking] many students do not take optimal paths through college, taking courses that do not count toward their intended degree or, for community college students, taking courses that will not transfer for junior standing in their desired major.”

The term ‘guided pathways’ is similarly creeping into the literature and practice³. In almost every case, a career or guided pathway connotes improved alignment between education and the labor market. There is considerable work currently underway in Texas, especially within the higher education community, to define and operationalize career pathways⁴. In most cases, the term career or guided pathway is used to describe articulated educational curricula organized around an employment centered goal. It often includes the notion of building a portfolio of skills or credentials to help a student prepare to compete for desirable a.k.a. ‘good’ jobs.

But that same student is likely to spend the next 35 or 40 years in the labor force. Which means that getting through an articulated education program is just the first step in one’s long term career development process. The term frequently used to describe the movement among and between occupations over the course of one’s career is called a career progression.

While career pathways are important to the student population, the workforce development system is most often working with dislocated and otherwise unemployed persons trying to earn a living, support a family, and grow their career opportunities. Most workforce participants have completed their formal education – at least that traditional, linear route with which we are all so familiar. Many are in entry-level jobs with little knowledge of where to go or what to do next to earn a better living.

For these individuals, the career progression lattices serve as a roadmap to the future. They all start with an entry level occupation. After all, everyone starts somewhere. By examining transferable skills and leveraging available labor market data, the career progression lattices in this report demonstrate opportunities for personal growth, occupational mobility, wage progression and a blueprint for future education and skill acquisition.

Thus, while a student’s initial pathway and transition between education, training and entry level job is a critical period, how they build their subsequent work life and navigate an increasingly tumultuous labor market is equally critical. Indeed, the educational pathway that sets a student onto their own personal career lattice is only the beginning. Envisioning a career progression across their entire working life is the ultimate objective.

³ There seems to be general agreement that a guided pathway involves whole college reform, including student guidance, and not just course or program articulation. For information about guided pathways at Austin Community College see <https://sites.austincc.edu/guidedpathways/>

⁴ There are many efforts underway in Texas to promote career pathways and encourage students to take courses that are grouped together around a career aspiration. HB 5 created five ‘endorsements’ designed to help students entering high school acquire in-depth knowledge of a subject area of their choosing such as STEM or Arts and Humanities. *Accelerate Texas* is a joint initiative between the Texas Workforce Commission and the Texas Higher Education Coordinating Board to build capacity to expand career pathways in the state.

Career Ladders vs. Career Lattices

In decades' past, the concept of career advancement had a stair-step nature to it, often referred to as a career 'ladder'. A wage and salary worker stayed largely within the same company, certainly within the same industry, and with hard work and dedication, and perhaps a little good fortune, was promoted to increasingly more responsible positions. Each subsequent position paid a higher salary, and the timing of each move was determined by company management. This is the same model used in the military. Changing industries was relatively rare because it often meant 'starting over' and the loss of a wage premium that traditionally accompanied legacy industry knowledge. Those days are largely gone.

Today, rather than a stair-step career ladder, a career progression more often takes place on a 'career lattice'. There are two main distinctions between a career ladder and a career lattice. First, responsibility for job change shifts away from company management and puts career decisions in the hands of the worker. The worker chooses when to take a promotion or change jobs and doesn't rely exclusively on an employer to shape their career progression. Second, not all job changes are upward. Sometimes a move is lateral or downward depending on life circumstances. Stop-outs for education and training or unemployment can take one completely out of the labor market, i.e. off the lattice. Career changes that involve occupational or industry change are no longer unusual. The career lattice model is much more representative of today's work life experience.

In practice, very few new labor market entrants have any idea what the job market has in store for them. Some workers are subject to the 'accidental theory of career development' in which their work life is much more reactive than planned. Job changes tend to be more a function of serendipity or happenstance – taking advantage of opportunities as they arise. In this context, phenomena such as business cycles, intra-organizational changes, and personal circumstances like who you know or meet – most of which are out of a workers' control – are more important than a guiding career development strategy.

There is no doubt that everyone's career trajectory has some serendipity in it. But good luck, or the absence of good fortune, should not be a substitute for a career strategy.

What is certain and pervasive is that each person begins their work life with a starter set of skills, both technical and behavioral. The question is, how do they build – or even conceptualize – a life-long career progression that provides opportunity for increased earnings and advancement? How does a worker assess and navigate subsequent career opportunities? In other words, what information is available to help a worker conceptualize a lifelong career progression lattice and how do they internalize the reality that their entry level skill set will place them on a personalized career lattice? Do they understand that movement within and upward on that lattice will likely be dependent on individual initiative and the acquisition of additional skills and credentials? The idea behind a skill-based career progression lattice model is that actionable labor market information can be developed and presented in a way that provides decision support for real life career decision-making.

“Being in charge of your worklife doesn't mean you always move with assurance and sublime self-confidence; it means you keep moving, continuing on your own path, even when you feel shaky and uncertain.”

Charlotte Beer,
author, *“I'd Rather Be in Charge: A Legenday Business Leader's Roadmap for Achieving Pride, Power and Joy at Work.”*

Career Progressions and the WIOA

The Workforce Investment Opportunities Act (WIOA) legislation encourages local workforce boards to explore best practices to leverage the existing knowledge and skills of workforce customers to set them on a pathway to career success. Specifically, Subtitle A - System Alignment, Chapter 1—State Provisions, SEC. 101 - State Workforce Development Boards, (d) (5) (C) encourages local boards to disseminate information on “*effective training programs that respond to real-time labor market analysis, that effectively use direct assessment and prior learning assessment to measure an individual’s prior knowledge, skills, competencies, and experiences, and that evaluate such skills, and competencies for adaptability, to support efficient placement into employment or career pathways.*”

The Workforce Solutions Rural Capital Area career progressions project is designed to address this objective. The career progression lattices flow from an Anchor or entry-level occupation. The upward movement on a lattice is a function of a worker’s prior work experience, plus any additional skills they can acquire through either formal or informal means. The progression concept itself is a variation of a career pathway model that is aimed at individuals who have largely completed their formal education and are trying to build a long-term career direction while in the workforce. This differs from most traditional career pathway models whose foundations are education articulation while the individual is still in school. It is thus a model more aligned with the mission, goals and primary customer base of the workforce development system.

The WIOA provides its own definition of a career pathway in the context of workforce services. The Act specifies that a ‘career pathway’ means a combination of rigorous and high-quality education, training, and other services that –

- (A) aligns with the skill needs of industries in the economy of the State or regional economy involved;
- (B) prepares an individual to be successful in any of a full range of secondary or postsecondary education options,
- (C) includes counseling to support an individual in achieving the individual’s education and career goals;
- (D) includes, as appropriate, education offered concurrently with and in the same context as workforce preparation activities and training for a specific occupation or occupational cluster;
- (E) organizes education, training, and other services to meet the needs of an individual in a manner that accelerates the educational and career advancement of the individual to the extent practicable;
- (F) enables an individual to attain a secondary school diploma or its recognized equivalent, and at least 1 recognized postsecondary credential; and
- (G) helps an individual enter or advance within a specific occupation or occupational cluster.

The career lattice approach addresses all these criteria. An individualized lattice helps a worker visualize an upward career mobility plan, provides direction and context for additional postsecondary instruction, and is predicated on optimizing a worker’s earnings capacity by aligning their skills with labor market opportunities.

In addition, the career progression concept is an excellent approach to understanding and moving workers into a growing segment of unfilled ‘middle skill’ jobs. These are jobs that require some level of postsecondary education or credential and traditionally build on entry-level skills. The career progression lattices show not only various entry-level jobs that can lead to ‘middle skill’ opportunities but demonstrate upward mobility potential into a range of high skill/high wage jobs also envisioned in the WIOA.

Career Progressions and What They Mean for the Rural Capital Area

"If you don't know where you are going, you'll end up someplace else."

Yogi Berra

As discussed above, this career progressions project is intended to help the Rural Capital Area workforce staff meet and address several objectives identified in the WIOA. Section 2 (Purposes) of the new Act clearly lays out those expectations in item (6), which says *"For purposes of subtitle A and B of title I, to provide workforce investment activities, through statewide and local workforce development systems, that increase the employment, retention, and earnings of participants, and increase attainment of recognized postsecondary credentials by participants, and as a result, improve the quality of the workforce, reduce welfare dependency, increase economic self-sufficiency, meet the skill requirements of employers, and enhance the productivity and competitiveness of the Nation"*.

The career progression lattices visually display potential earnings growth trajectories for workers in entry level jobs. The lattices also clearly demonstrate the high correlation between enhanced earnings and continued formal education, especially showing the potential return on investment for recognized postsecondary credentials ⁵.

The need to increase earnings is a major driver for most career changers, especially in the face of changes in family composition. A good illustration of this concept comes from the Living Wage Calculations developed by Amy Glasmeier at MIT. According to her calculations, in 2019 a single person living in Williamson County (Round Rock) must make \$12.56 an hour (\$26,125) to achieve a living wage. However, that wage rises to \$25.13 per hour (\$52,270) for a single worker with one child, and to \$28.74 per hour (\$59,779) for a worker with 2 children. It may be trite to observe that children are expensive, but individuals with families working in entry-level jobs are most in need of embarking on a career progression that will allow them to support their family situation. These families often require multiple wage earners in a household, stretching thin the family support network.

A career progression lattice can help an individual and their case manager highlight education and skill gaps and provides a concrete vision around which to discuss how a worker can address these gaps and move forward in their career. Most workforce customers are looking for a better future for themselves and their families. A career lattice lets them see where they are now, what opportunities lay before them, and what it takes to get there.

The lattices are based on transferable skills and built around likely skill requirements of regional employers. Occupations included in each lattice are customized to the employment and wage composition of the Rural Capital Area region, thus reflecting the business structure of the area. Many of the occupations included on the various career lattices were mentioned by area employers in the personal interviews conducted as part of this project, albeit often using job titles unique to their own companies.

Lastly, a career progression lattice, sometimes referred to as a career map, is a part of a longer-term educational strategy. In their paper *Setting Goals: Who, Why, How?* researchers at Harvard University point to the huge value to educational goal setting. Individuals who set goals, including education and career objectives tend to have:

- increased motivation and self-regulation by taking ownership of learning goals
- increased persistence, creativity and risk-taking in achieving goals
- reduced undermining effects of anxiety, frustration, and disappointment,
- enhanced joy, pride & confidence as a result of higher levels of engagement

⁵ A unique feature of the career progression lattice concept is that it is not driven by a de facto continuous educational sequence predicated on award levels, e.g. high school to Community/Technical College to University. Rather the need for higher levels of formal education emerge naturally as skill requirements and wage expectations increase in the upper tiers of the lattice.

A career lattice lets an individual visualize a path for occupational mobility and focus attention on personal development. The lattice or career map can be used to lay out a career goal, identify action steps, measure progress, and keep someone heading in the right direction. Career mapping, like life itself, can be very unpredictable. There are no guarantees that one might not get lost along the way, become satisfied at any given career level, or completely change gears and jump to an entirely different lattice. That's not a problem. As General George S. Patton once said, "a good plan today is better than a perfect plan tomorrow".

Constructing Career Progressions for Workforce Solutions Rural Capital Area

The project goal for the Rural Capital Area career progression initiative was to construct career lattices that encompassed all thirty-nine (39) of the approved Target Occupations on the 2019 list. Because the methodology for developing a Target Occupations list by definition excludes entry-level occupations for which minimal or no training is required, only one of the Rural Capital Area Target Occupations (Medical Assistant) qualified as an Anchor occupation from which to construct a career progression lattice. That said, the objective was to assure that each of the 39 Target Occupations fit within one or more career progression lattices. The initial challenge was to determine which occupations could reasonably serve as entry-level or Anchor occupations for each lattice that would subsequently include all 39 Target Occupations.

Building the Lattice Master Database

The first step in the methodology was the construction of customized master data files that include detailed work activity⁶ (DWA) profiles for each occupation, plus regional labor market data for the Rural Capital Area region.

To construct the source data files, a master database was built that includes all Standard Occupational Classification (SOC) occupations with several metadata descriptors. A DWA profile was constructed for each SOC code in the occupational universe based on the *SkillsEngine* Detailed Work Activity skill library. *SkillsEngine* is a division of the Center for Employability Outcomes (C4EO) at Texas State Technical College. *SkillsEngine*⁷ provides advanced skill curation and translation expertise that can be used to transform unstructured text into rich occupational metadata. For our purposes, the *SkillsEngine* DWA library - already linked to ONET occupational titles - was linked to SOC codes to facilitate the connection with regional labor market information.

The DWA skill profile database was parsed to include the top 200 DWAs per SOC for each of 822 occupations for which the Rural Capital Area had documented employment. A stack ranking of DWAs within each SOC was accomplished by using a combination of the relevancy ratings included in the *SkillsEngine* database and a SOC-centric weighting schema driven by a combination of AutoCoder⁸ thread scores (strength of match) from the linked occupations and the projected annual average job openings due to growth estimate from Chmura Economics for the Rural Capital Area. Because the objective of the weighting schema is to prioritize and weight skills based on available regional job opportunities

⁶ A detailed work activity (DWA) is a transferable skill statement within an occupational title that describes specific activities a worker is likely to do on the job. DWAs represent the most practical, relevant and pervasive proxy for a 'skill' in the current information marketplace - with 'skill' defined broadly as a capability to perform tasks that have a positive effect on productivity. The original DWA domain was developed as part of the content model for the federal O*NET initiative. DWAs used in this project from *SkillsEngine* are discussed in greater detail in the methodology section of this report.

⁷ *SkillsEngine* also offers an API that can be embedded in any end-user software system to serve as the skill translation engine for profiling curricula, job postings, resumes, etc. See SkillsEngine.com for additional information on the API and other skill translation capabilities.

⁸ Additional occupational title-to-title skill transferability analysis was performed using the AutoCoder utility developed by RM Wilson Consulting Inc.

(SOCs) that show better than average growth prospects, a ratio was created that is comprised of the percent of projected job openings due to growth as a percentage of (divided by) of total occupational employment.

The initial data development process required a comprehensive skills gap analysis between the 40 Target Occupations (39 occupations plus an entry for Teacher certification training) and all 822 occupations in the SOC occupational universe in which the Rural Capital Area had documentable employment. This process was accomplished using detailed work activities as the common currency for skill transferability.

The DWA skill library used for this project mirrors the ONET job analysis domain of the same name. In this case however, the DWA skill library is an enhanced and extended version that has been curated and modified by TSTC/*SkillsEngine* staff. The *SkillsEngine* DWA library has several thousand additional skill-to-occupation assignments than ONET and has been meticulously scrubbed by outside industrial psychologists to improve consistent sentence syntax, appropriate action-based verb selection, and more complete and appropriate DWA-to-occupation assignments. The extensive review and curation of the *SkillsEngine* DWA skill library was essential to extending the transferable skills concept into building a career progression lattice.

The master SOC-based skill analysis file showed the alignment match scores for each of the 39 Target Occupations as they relate to every other occupation in the Rural Capital SOC universe. The resulting file contained 21,364 records. Clearly, however, some occupations have little to no skill commonality with any Target Occupation. For example, there is almost no commonality between a Social and Human Services Assistant and a Mechanical Engineer or between a Medical Assistant and an Engineering Technician. To winnow the file to a manageable level, those Target Occupations-to-SOC linkages with ten (10) percent or fewer common skills were eliminated. This reduced the file to roughly 4,370 records.

Attached to each occupation were several important labor market characteristics variables. Because each tier of a career progression lattice demonstrates increased education and training requirements, it is necessary to understand the usual or typical education level required of each occupation. For this task, many analysts turn to the 'typical education' variable developed by the Bureau of Labor Statistics (BLS). BLS researchers use an eight-category taxonomy from which every occupation is assigned a rating that is the typical entry-level education. For career progression purposes, it is important to understand not only the entry-level education, but the educational requirement that allows a worker to be competitive for any job in that occupation. Moreover, the BLS education taxonomy is actually a three-part construct that includes additional domains for the typical level of on-the-job training and experience level associated with the occupation. Thus, the BLS education variable falls short for the purposes of this project.

This analysis incorporates a proprietary education assignment construct called the Competitive Education Requirement (CER). The CER indicates the education level one typically needs to compete for available jobs in the occupation (Froeschle 2019).

There are several examples of the differences between these data sets that are particularly noteworthy. For example, the BLS assigns the label of 'High School Diploma or Equivalent' to the occupation 'Electrician'. In reality, extensive training after high school is required to become a qualified Electrician. The BLS accounts for this through another domain they

refer to as ‘Training’ in which they include training categories such as apprenticeship. The CER category of ‘Recognized Industry Credential’ acknowledges the necessity of post high school education and training, includes all occupations which typically require a license or certification, and whose usual preparation comes through apprenticeship. Combining all occupations that have a CER rating of Recognized Industry Credential, Associates degree and Bachelor’s degree meets the WIOA definition of occupations with a Recognized Post-secondary Credential⁹.

Also included in the master data base were a variety of wage and employment projections variables. For this project, we extracted the 2017 median occupational wages¹⁰ from both the Texas Workforce Commission/Labor Market and Career Information Department and from Chmura Economics for the Rural Capital Area LWDA and Texas statewide. We also pulled 2018-2028 long-term occupational projections from Chmura Economics and 2016-2026 projections from the TWC/LMCI department. The data sets were compared side-by-side to identify potential anomalies in either source. Ultimately, the Chmura data served as the default source for both variables.

The wage and projections data take on added significance on two fronts. The projections are used as a weighting variable in the transferable skill analysis. The wage data are particularly important in constructing the various tiers of the career progression lattice. In the final analysis, wage and projected job openings data from Chmura Economics proved to be the more useful variable, largely because of the extent of coverage. Although the totals from both sets of projections were fairly close, the TWC/LMCI projections covered only 348 detailed occupations – leaving 469 individual occupations without an employment estimate. Moreover, the TWC projections did not individually account for 16.1% of base year employment and 15% of the projected year employment.

Although the preferred source of projections for this project might have been the publicly available data from the TWC/LMCI department, the data items necessary for this project are subject to cell suppression under government confidentiality rules. TWC makes no effort to backfill suppressed cells using other, disclosable data sources. Chmura uses these same public-sector data sets produced by TWC/LMCI as part of their methodology, but augments suppressed industry employment data with external sources. This reduces the number of ‘holes’ in the occupational data, providing the additional occupational detail crucial to the progressions methodology. Chmura provides occupational projections and wage data for 822 SOC occupations. Because the labor market data are used to drive a comprehensive weighting methodology that covers the universe of occupational employment, having complete coverage for all occupations was a priority and made the Chmura data a better option for this effort.

Selecting Anchor Occupations

Since the Target Occupation list is used to direct education and training investments, it must, by administrative definition, lead to a self-sufficient wage and require some level of post-secondary instruction or credential. Thus, the occupations on the target list are not intended to serve as Anchor occupations in a career progression lattice.

However, many previously dislocated or unemployed workforce customers worked in entry-level jobs that could serve as the point of entry from which they could, with additional education and training, progress to higher paying occupations – including those on the Target

⁹ WIOA Section 3. Definitions (52) defines ‘recognized post-secondary credential’ to mean a credential consisting of an industry-recognized certificate or certification, a certificate of completion of an apprenticeship, a license recognized by the State involved or Federal Government, or an Associate or Baccalaureate degree.

¹⁰ The Texas Workforce Commission released 2018 occupational wage data in the middle of this project.

Final Anchor Occupations

Anchor Occupation Number	SOC	Anchor Occupation Title	Competitive Education Requirement (RCF)	Avg Ann Wages 2017
1	47-3012	Carpenters Helpers	No formal educational credential	\$27,500
2	39-9011	Childcare Workers	High school diploma or equivalent	\$23,400
3	53-7061	Cleaners of Vehicles and Equipment	No formal educational credential	\$24,800
4	15-1152	Computer Network Support Specialists	Associate's degree	\$62,300
5	47-2061	Construction Laborers	No formal educational credential	\$31,100
6	43-9021	Data Entry Keyers	High school diploma or equivalent	\$30,700
7	43-9031	Desktop Publishers	Associate's degree	\$40,800
8	51-2022	Electrical and Electronic Equipment Assemblers	High school diploma or equivalent	\$36,100
9	47-3013	Electricians Helpers	High school diploma or equivalent	\$32,200
10	47-5081	Extraction Workers Helpers	High school diploma or equivalent	\$33,000
11	43-4071	File Clerks	High school diploma or equivalent	\$33,300
12	31-1011	Home Health Aides	High school diploma or equivalent	\$23,000
13	43-4081	Hotel, Motel, and Resort Desk Clerks	High school diploma or equivalent	\$21,800
14	53-3033	Light Truck or Delivery Services Drivers	High school diploma or equivalent	\$36,900
15	31-9092	Medical Assistants	Recognized Industry Credential	\$32,200
16	31-9093	Medical Equipment Preparers	High school diploma or equivalent	\$30,800
17	39-9021	Personal Care Aides	High school diploma or equivalent	\$20,100
18	43-6014	Secretaries & Admin Assistants, Ex. Legal/Medical	High school diploma or equivalent	\$35,400
19	51-2092	Team Assemblers	High school diploma or equivalent	\$27,200
20	49-3093	Tire Repairers and Changers	High school diploma or equivalent	\$27,300

Occupations list. Thus, the objective for this project was to create a sufficient number of career progression lattices such that each of the thirty-nine (39) Rural Capital Area Target Occupations fit reasonably within one or more lattice.

To identify potential Anchor occupations, a.k.a. career progression lattice entry-level jobs, occupations were selected that had; 1) a relatively high DWA skills match, 2) similar or lower education requirements, and 3) a median annual wage less than the Target Occupation from which it was identified. The first cut of this process resulted in 197 potential Anchor occupations that covered all 39 Rural Capital Area Target Occupations.

Winnowing the list to 20 Anchor Occupations is an optimization challenge. The objective is to identify occupations that will align with the most Target Occupations across the various tiers of a lattice, while also making certain that every Target Occupation is connected to at least one Anchor occupation. In this process duplicate occupations were eliminated, along with occupations which had the same or higher CER rating. Remaining occupations were manually reviewed to identify Target Occupations that naturally fit on the same career lattice, eliminating the need for another unique lattice.

To increase the number of entry-level workers that could take advantage of the Rural Capital Area career progression initiative, occupations were selected that had higher levels of labor market activity. Ultimately, occupations with fewer than 50 employed persons in 2018 in the Rural Capital Area were eliminated from consideration. It should be noted that two Anchor occupations, Data Entry Keyers and Electric and Electronic Assemblers, were selected that have negative projected regional growth rates. Many workers in these occupations will need to find an alternate career path, making the career lattice concept even more important to these individuals.

Developing Career Progression Lattices

To develop the career progression lattices from each Anchor occupation, five occupations constituting Tier I occupational options were selected based on; 1) highest DWA skill strength of match score with the Anchor occupation, 2) wage rate at or above the Anchor occupation, and 3) the closest competitive education requirement (CER) level to the Target Occupation. The reason for selecting close education requirement levels is to show opportunities for earnings advancement that **do not necessarily** require additional formal education.

Although each of the 20 career lattice diagrams starts with an Anchor occupation, in practice that process starts with a worker's resume or related work history that qualifies them for employment in the Anchor occupation. An individual's resume serves as a proxy for their previous education, experience or qualifications that qualifies them to perform in the Anchor occupation.

Each Anchor occupation was compared to all other SOCs based on the strength of skill alignment, e.g. the degree to which the top 200 stack ranked DWAs for the Anchor occupation aligned with the stack ranked skill profiles of all the other 822¹¹ occupations in the SOC universe. The comparison looked at both the number of DWAs the occupations had in common and, to ensure that the most significant DWAs for each occupation contributed more heavily to the match process, the degree to which they shared the same highly ranked DWAs (degree of fit). Using this approach, each Anchor occupation was connected to multiple potential Tier I occupations prioritized by the strength of match¹². Alignment scores of 40 and above were considered as first tier potential matches for the Anchor occupation. Education levels and wages were also considered in the selection of the five Tier I occupations.

To determine Tier II occupations, a cumulative DWA profile was created that was an amalgam of DWAs from the Anchor occupation, plus DWAs from all five Tier I occupations, plus DWAs from several occupations highly related to Tier I occupations based on the AutoCoder utility (less duplicates). This new 'super Anchor' occupational profile assumes that workers on this lattice have an expanded skill set from working in at least one of these occupations that should be considered when seeking higher order opportunities¹³. Tier II occupations were selected based on closest education level, the highest possible skill strength

¹¹DWA skill profiles are available for 850 SOC occupations. Chmura Economics publishes requisite projections and wage data for 822 occupations for the Rural Capital Area, and so the universe of occupations for this analysis is 822 occupations.

¹²Strength of match scores are not shown on the lattice maps because with each tier of the lattice the strength of match statistics are no longer normalized and thus can be difficult to explain.

¹³The 'super Anchor' DWA profile is based on the statistical manipulation of three fundamental content values. The goal is to create a robust skill cluster using the Detail Worker Activities (DWA) for each occupation in the previous tier. The following parameters are employed to build the skill cluster to match against the entire regional labor market: **[1] Detail Work Activity Relationship Score:** For each SOC occupation, expert review from SkillsEngine industrial psychologists assigned a relationship value that shows the relative importance of the DWA to each occupation to which it is assigned. Relationship scores for the Anchor occupation and occupations from the previous tier are used to differentiate highly relevant DWAs to be prioritized in the super Anchor DWA profile. The value assignments range from 1 to 3 where 3 is most relevant. Only DWAs with relationship scores of 2 or 3 are included in the super Anchor profile. **[2] Local LMI Data Estimates:** To ensure that the skill cluster reflects the regional occupational structure, regional estimates of Job Openings Due to Growth from Chmura Economics are used to prioritize high demand occupations and weight DWAs by occupation. This value is included in the weighting algorithm to build the top 200 DWA statements for each occupation. **[1] Auto-Coder Scores:** The methodology seeks to create a skill profile that includes the most relevant DWAs from the preceding tier. We used the AutoCoder utility, a thematic-based content analysis algorithm developed by Bob Wilson, to focus on the descriptive aspects of related occupations. Typically, AutoCoder scores greater than 50 on a normalized scale of 100 are used to select related occupations.

The combination of [1], [2] & [3] above provides the mathematical basis to create a hierarchical set of the most significant 200 DWA skill statements using the strongest matching series or vector for scanning the entire labor market. This vector is compared to every occupation in the SOC occupational dictionary. The occupations which match the skills vector are the most highly recommended candidates for the next level of occupations in the lattice. Occupations which are less than a 30 percent match against the weighted vector are eliminated a priori.

¹⁴ The fifteen percent threshold has no theoretical basis, other than to provide meaningful earnings separation between each tier of the lattice.

¹⁵ Each lattice has a different earnings spread between the Anchor occupation and Tier IV or 'Apex' occupations. For example, Computer Network Support Specialists has the largest spread of \$89,775 between Anchor and Apex occupations for a 261% upward reach. This large spread is mostly a function of a very high Apex average occupational wage driven by highly paid Computer and Information Systems Manager. Other occupations such as Childcare Workers Electrical and Electronic Equipment Assemblers have lower top tier earnings. Lattices with Apex occupations which include Manager or Director positions tend to have higher top end average wages than those that lead to non-manager jobs. In any case, even the lowest earnings spread from Anchor to Apex occupation represents 130.1 percent potential increase, with an average of over 205.8 percent. From this perspective, the lattices clearly show career opportunity and potential earnings advancement.

¹⁶ There are five steps in the final selection process; 1) Review the highest skill match options, 2) Sort the working file by regional occupational wage. The average earnings from the preceding tier sets the floor for next level options. Eliminate occupations, even high skill match occupations, with wages below the floor, 3) Examine remaining options for high skill match scores and above average regional labor market demand. Select options that score as high as possible along both dimensions. Highlight these for final review, 4) Consider education, available job postings, and field of study alignment from preceding tier selections, and 5) Make final selections to populate tier.

of match score, a minimum of 5 projected job openings in the region, and a median wage that is at least 15 percent¹⁴ above the average for all Tier I occupations. A chart that shows the average earnings for each tier for all the lattices is included below¹⁵.

The same iterative process was performed to generate Tier III and Tier IV occupations. In this iterative process, each tier of SOCs brings forward a cumulative 'top 200' DWA cluster for each subsequent pass, excluding redundant SOCs from lower tiers. In other words, as we move from the Anchor occupation through the various tiers, each match against the remaining occupational universe includes all the DWAs that have been accumulated, weighted, and re-ranked based on previous occupational options.

The final occupational selections are essentially subjective, driven by highest skill match, evidence of above average labor market demand, and median wages. Competitive education level is considered but it is not the primary driver. For example, in the case of the Rural Capital Area, several lattices have Tier IV occupations that require only an Associate's degree, e.g. Aircraft Mechanics on the Vehicle Cleaner lattice and Dental Hygienist on the Home Health Aide lattice¹⁶.

In essence, this creates a moving top 200 DWA framework that weights more heavily the ranked DWAs from the most recent tier. As one moves up the lattice across tiers, the occupations identified are more heavily influenced by a new 'super Anchor' DWA profile of 200 DWAs. From a labor market perspective, this process emulates an individual who once had only skills related to a lower, entry-level occupation. But, as that worker gains experience and adds to their skill set, the lesser value skills roll off their DWA profile in favor of DWAs associated with higher skilled occupations. In some ways, this process is like an experienced worker's resume that no longer includes any high school, after-work jobs. Sure, those skills are still probably part of that individual's skill profile, but they are not the skills upon which they will base their future job search.

The occupations selected for the career lattice map represent the closest matches with occupations from the preceding tier. It is important to note that limiting the progression to four or five top occupational matches is arbitrary, mostly to facilitate visual display of the data. In reality, each tier can have many more highly matched occupational options. The goal of building the career lattice maps is to quickly demonstrate the potential for progression – something which many workers have difficulty recognizing in the abstract.

Although the potential for upward career movement is theoretically unlimited, by including only the best aligned occupations across four tiers, the lattices show possible career paths starting with each Anchor occupation. The competitive education level is considered in building the tiers in each lattice, but, as noted previously, upward movement from one tier to the next might require extensive additional formal education. In thinking about career progression from the perspective of a lattice, there is no such thing as a 'dead end' job, i.e. one from which there are no upward paths. But clearly there are occupations from which upward movement requires considerable skill enhancement; either in the form of a postsecondary degree, license or certification, or other credential.

Interpreting the Career Progression Lattice

As the Rural Capital Area employer interviews demonstrate¹⁷, the hiring decision – and which qualities are viewed as important – is influenced by many different factors, including worker qualifications in technical skills, experience, workplace essential skills and digital information processing skills. From the perspective of the individual, work experience in occupations with similar skills is just one aspect of building a career. Other influencers include experience in the actual occupation, general economic conditions including prevailing labor shortages or surpluses in the region¹⁸, and the general demeanor, competence and attitude of the applicant, often referred to as workplace essentials or ‘soft skills’.

In other cases, specific knowledges, certifications, licenses or other qualifications may be mandatory to get any given job within an occupation. Thus, the career progression lattice is simply a graphic display of possibilities for building a career starting from an entry-level position. But the ability to visualize a career progression which is not limited to a lifetime of secondary labor market jobs is an important step toward creating an individual career plan, injecting hope and potential into the career development process, and giving the client a realistic view of labor market and earnings opportunity.

Each career progression is developed based on identifying related and transferable skills among occupations. There is no such thing as a best or exclusive route, even on the same lattice, for every individual. That would violate the very premise upon which the lattice concept is built. Each tier of a career progression lattice is based on the degree of skill overlap or commonality between and among occupations. Behind each occupation on each tier of the lattice is a match percentage or ‘fit’ score between the Anchor occupation and each Target Occupation on the subsequent tier. Behind the scenes in the skill matching process, the match score provides a relative sense of the degree to which occupations share common skill sets. Clearly, the higher the percentage match, the greater likelihood that a person in one occupation has the skills needed to be qualified for jobs in the companion occupations. Each tier is designed to show occupations with the greatest skill commonality.

It is important to note however, that it is always possible to have a high technical skill match and, given the other types of qualifications noted above, still not be able to secure a job in the Target Occupation. On the flip side, strong ‘workplace essential’ skills could overcome a dearth of technical skills or experience and allow a worker to move into a job for which they may not otherwise be qualified.

¹⁷ See Appendix A of this report

¹⁸ Almost all of the Rural Capital Area employers interviewed commented on the general shortage of available workers. Labor availability, in turn, influenced how and where they recruited workers, the scope of their recruitment efforts, and the extent to which internal training initiatives were necessary to bring new hires up to speed. These observations are consistent with the August 2019 unemployment rate for the Rural Capital Area of 2.9 percent.

Average Wage by Tier for Rural Capital Area Career Progression Lattices							
	Anchor Occupation Lattice	Anchor Occupation Wage	Tier I AVG Wage	Tier II AVG Wage	Tier III AVG Wage	Tier IV AVG Wage	Highest Paying Apex Occupation
1	Carpenters Helpers	\$27,500	\$40,540	\$49,240	\$61,075	\$76,825	\$92,400
2	Childcare Workers	\$23,400	\$29,720	\$38,780	\$50,275	\$67,800	\$83,600
3	Cleaners of Vehicles and Equipment	\$24,800	\$36,000	\$47,320	\$60,325	\$85,625	\$120,200
4	Computer Network Support Specialists	\$62,300	\$79,500	\$83,097	\$96,125	\$152,075	\$162,800
5	Construction Laborers	\$31,100	\$34,780	\$47,620	\$56,450	\$105,200	\$165,800
6	Data Entry Keyers	\$30,700	\$42,700	\$53,420	\$66,525	\$84,450	\$93,000
7	Desktop Publishers	\$40,800	\$50,460	\$67,120	\$77,000	\$127,450	\$148,000
8	Electrical and Electronic Equipment Assemblers	\$36,100	\$38,680	\$45,800	\$60,175	\$83,075	\$120,700
9	Electricians Helpers	\$32,200	\$39,740	\$46,780	\$60,175	\$80,925	\$116,500
10	Extraction Workers Helpers	\$33,000	\$39,980	\$51,680	\$60,300	\$88,125	\$120,700
11	File Clerks	\$33,300	\$35,780	\$41,660	\$63,325	\$95,300	\$132,400
12	Home Health Aides	\$23,000	\$28,840	\$43,860	\$59,525	\$89,750	\$104,400
13	Hotel, Motel, and Resort Desk Clerks	\$21,800	\$31,380	\$46,340	\$64,050	\$111,125	\$143,200
14	Light Truck or Delivery Services Drivers	\$36,900	\$40,680	\$51,940	\$70,000	\$107,350	\$130,400
15	Medical Assistants	\$32,200	\$36,340	\$48,040	\$78,125	\$105,375	\$158,800
16	Medical Equipment Preparers	\$30,800	\$41,460	\$55,100	\$68,275	\$81,800	\$104,400
17	Personal Care Aides	\$20,100	\$26,980	\$46,060	\$66,150	\$91,175	\$103,800
18	Secretaries & Admin Assistants, Ex. Legal/Medical	\$35,400	\$38,920	\$59,300	\$74,075	\$108,150	\$137,400
19	Team Assemblers	\$27,200	\$35,440	\$47,020	\$59,550	\$91,025	\$120,200
20	Tire Repairers and Changers	\$27,300	\$34,740	\$45,120	\$59,050	\$86,350	\$120,200
	Tier Averages	\$30,120	\$37,106	\$48,303	\$62,474	\$92,106	\$119,325

Navigating a Skill-based Career Progression Lattice

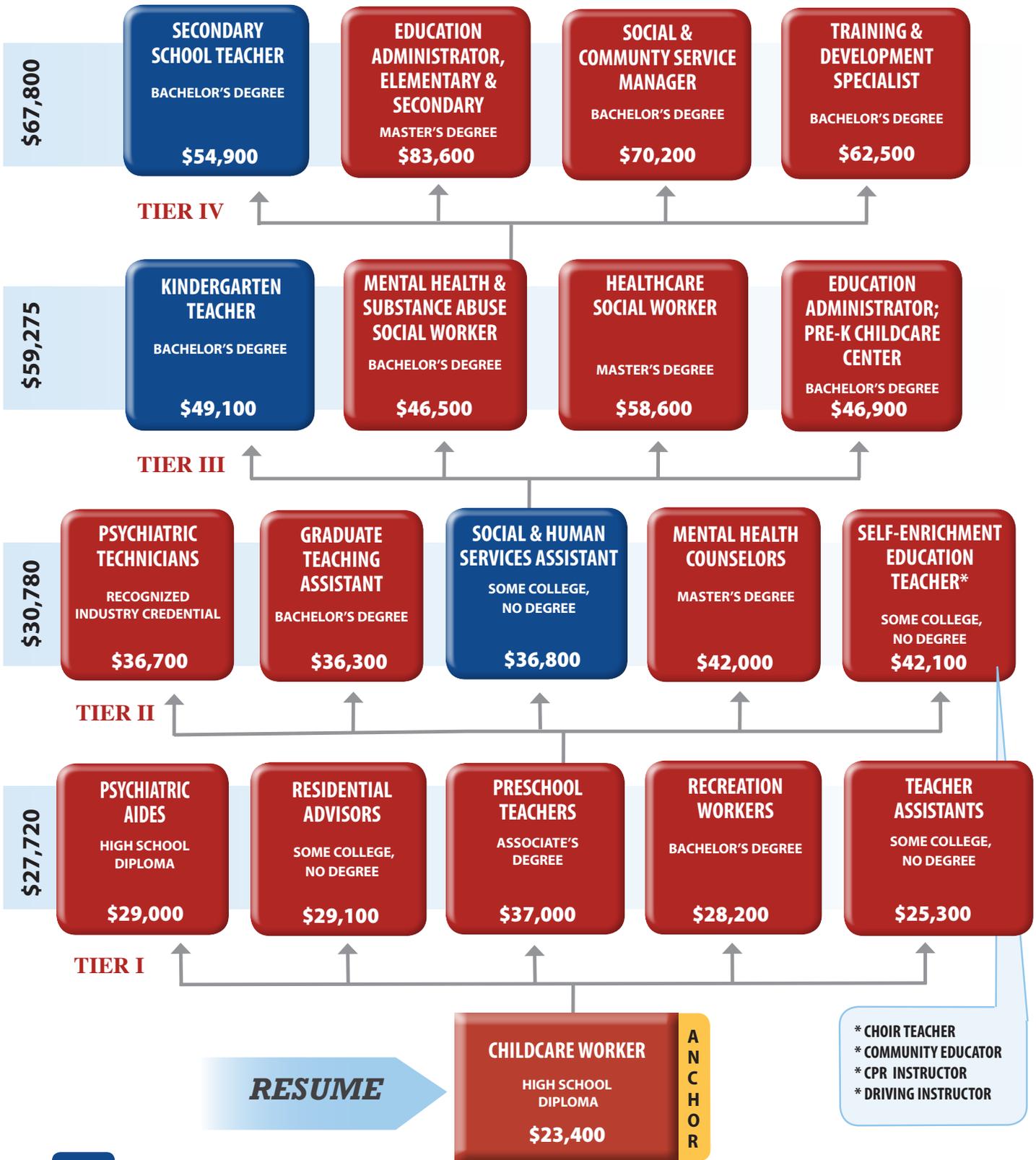
The process of navigating your way to career success has to start somewhere in the labor market, vis-à-vis an entry level job. Depending on educational background and other circumstances, some entry level jobs can be higher than others in labor market prestige or pay scale. In the Computer Design Services industry, for example, even entry-level Computer User Support Specialists or Computer Network Support Specialists tend to require some postsecondary education and are well-compensated. One of the Rural Capital Area lattices starts with Computer Network Support Specialist which generally requires an Associate's degree and starts at \$62,300. The career progression for this occupation is quite steep, requiring considerable additional education, training or experience to advance. It is also quite lucrative.

But everyone has a starting place on their own personal career lattice, which is one reason gaining entry level employment for even the least educated or skilled person is one of the best first steps to long term career development. Once in an entry level job, the worker's options are simple; to stay in that job or to move on. Moving on requires one of two choices; 1) using the skills you already have and try to get a better job (however one defines 'better') in the same general occupation, or 2) acquiring additional skills that allow you to compete for jobs in another occupation. In either case, the objective is usually (but not always) to forge a better living, e.g. earning higher wages without sacrificing time away from remunerative work to acquire additional skills. So, for each occupation there are usually several other occupations that require the same or similar types of skills. That's why a skill-based career lattice is so intuitively appealing.

In the sample career lattice for Childcare Workers, if a person starts as a Childcare Worker (as the entry level or 'Anchor' occupation) seeking to move upward on their lattice they have two options; 1) to stay where they are, or 2) pursue other jobs. The pursuit of another job could be in the same occupation, perhaps in a higher paying industry or with another company. Thus, a move from novice Childcare Worker to experienced Childcare Worker (at the same or another business) is always a possibility; although not necessarily represented on the lattice diagram.

If a worker chooses to take her skills as a Childcare Worker and move upward into another occupation, the task becomes determining the degree to which her same skill set can be applied in another occupation. The questions for the person working as a Childcare Worker become; 1) how does one determine what those other, higher paying occupations are? 2) to what extent can they rely on their existing skills or any additional skills they acquire, to be qualified for jobs in another occupation (fill their personal 'skills gap')?, and 3) is the rate of pay or growth in job opportunities in other occupations sufficiently attractive that it is worth the additional investment in their skill profile? The example of a Childcare Worker career progression lattice begins to answer these questions.

As discussed in the methodology section, a DWA skill profile was generated for a Childcare Worker using a variety of DWA processing techniques. Similar DWA profiles were also created for each of 822 SOC based occupations weighted by labor market data for the Rural Capital Area. Based on a strength of match scoring method, five SOC's that had high strength of match scores, higher wages, and reasonable job opportunities were identified; 1) Teacher Assistant, 2) Recreation Worker, 3) Preschool Teachers, 4) Residential



Note: blue boxes indicate Rural Capital Area Target Occupation

Advisors, and 5) Psychiatric Aides. There is no magic to only selecting the top five occupational matches - and many more could be listed. But each subsequent potential occupational match has diminishing fit or match scores; ultimately to the point where skill transferability essentially vanishes.

According to data from Chmura Economics, the mean annual wage for a Childcare Worker in the Rural Capital Area is \$23,400. Of the five best transferable options (recall that staying in the same occupation but in a different, hopefully higher paying job is always an option), all five pay more than the Anchor occupation. The Preschool Teacher is the highest paying of the five options, and also had the highest skill match, but typically requires at least an Associate's degree¹⁹. Teacher Assistant also has a very high skill match, indicating that the subject will likely require fewer additional skills to be qualified for job openings, but is the lowest paying option. All five Tier I occupations pay above the wage of the Anchor occupation so none of them is a bad option.

Assuming the objective is to improve their economic position in life, the subject is faced with these choices. The easiest step (high skill match, less education required) would be to go for a job as a Teacher Assistant. Jobs in this occupation pay almost \$2,000 more and typically require no more than a few college courses. The highest paying option, Preschool Teacher, would require an Associate's degree. Depending on labor market demand, any of the Tier I occupations would offer a career progression. For purposes of making a career progression, the worker chooses among the five options on the career lattice, determines if additional education or training is necessary, seeks jobs in the chosen occupation, and continues her career in a new, higher paying occupation. Ofttimes, the worker might look at occupations much higher on the lattice e.g. Secondary School Teacher, or local Target Occupations and make choices with those career goals in mind. And onward goes the career progression process.

Let's say, for example, the worker chose Teacher Assistant. She might look at the specific DWA work activities required of that job and determine if she has the ability to perform those activities now and/or pursue some additional skill-based training to complete her resume. This assessment is essentially a personal 'skill gap analysis' - e.g. which work activities she will be asked to perform in the new job that she is not currently, nor has she previously performed in her past. Given her past experience as a Childcare Worker and new-found understanding of early childhood education and instructional methods from several classes at Austin Community College, she pursues and gets a job in this occupation.

After some time in this new position, picking up valuable work experience and new skills, the next step could be moving to another Teacher Assistant job with higher pay, better work environment, etc. Or, by applying existing skills - and any necessary additional education, skills or certifications - she could make the next move up the lattice. Using the same DWA profiling and strength of match analysis, the occupational choices for the next step of her progression, displayed as 'Tier II' occupations, are now; 1) Graduate Teaching Assistant, 2) Mental Health Counselor, 3) Self-enrichment Teacher, 4) Psychiatric Technician, and 5) Social and Human Services Assistant²⁰.

The highest skill match among Tier II occupations would be Graduate Teaching Assistant, but jobs in this occupation require at least a Bachelor's degree. An excellent Tier II option might be Social and Human Services Assistant which represents a good pay increase, does not typically require a higher education degree, and is found on the Rural Capital Area

¹⁹ The analysis for this lattice uses federal Standard Occupational Classification (SOC) occupational titles. Actual job titles for Childcare Workers might be Childcare Attendant, Daycare Worker, or Nursery Worker. Some SOC titles fall under an 'Other' categorization. A very helpful resource for identifying various 'payroll job titles' that might be classified within an 'Other' category can be found using the AutoCoder utility on the Texas Workforce Commission Labor Market and Career Information website at <http://autocoder.lmci.state.tx.us:8080/jc/onetmatch>. The U.S. Department of Labor ONET Code Connector website at <https://www.onetcodeconnector.org/> may also be helpful. These payroll job titles are very useful when searching for online job postings because of the specificity of firm-specific job titles in online postings.

²⁰ The worker could also move laterally within the same tier, choosing perhaps Preschool Teacher as her next career objective. In Texas, some preschools may also require you to earn an official Texas state teaching certification. This is conferred by the Texas Education Agency as a Generalist teacher certificate for early childhood (EC) through grade six.

Target Occupations list. This indicates that the Board has documented significant regional job opportunity in the occupation. On the lattice diagrams, Rural Capital Area Target Occupations are highlighted in blue.

Interestingly, at this juncture in the career progression the need for additional education and training starts to become important, even if the credential is a teaching certificate. The reality of more education and training leading to better job opportunities, as depicted on the lattice, represents a real-life skill gap between those that never leave secondary labor market jobs and moving up the lattice to self-sufficiency.

The value of the career lattice approach is that every occupation can be the 'entry level' starting place for career advancement. In the case of our Childcare Worker, a complete picture of career advancement potential can be defined and visualized in advance. In some cases, there will be significant additional education, training, or license/certification necessary to make the leap to the next level. While preparing for that next opportunity, a worker may take a lower paying job or not work at all while they are building their skill profile or education portfolio. Thus, the concept of a career lattice conveys the possibility that a person may not have a straight upward career path, and indeed may hit dead ends, make lateral moves, find comfortable stopping places, or leave the labor market altogether for spells of unemployment.

As new levels are reached on the lattice through career change, each new occupation opens another unique set of opportunities – which may or may not be reflected in the lattice. In the Child Care Worker career lattice, for example, there is an option to pursue nurturing - teaching occupations (Teacher Assistant, Graduate Teaching Assistant, Kindergarten Teacher) or health-related - social service occupations (Social and Human Services Assistant, Healthcare Social Worker, Mental Health and Substance Abuse Social Worker). There is also an option to move into a supervisory role such as Social and Community Service Managers or Education Administrator, Elementary & Secondary. Moreover, each occupation on the lattice represents a new potential Anchor occupation for another - even more personalized - lattice.

One of the goals of the career progression lattice is to help make such career decisions 'informed choices' and thereby reduce the random and uncertain walk often associated with career development. Although job demand is already considered in constructing each career lattice, creating a path through the lattice based on the highest levels of job demand is a very viable strategy. In the career lattices for this project, projected annual average job openings were an important consideration but not the primary driver for occupational selection.

Thus, as a worker ponders their next move there are many things to consider. This exercise focused on regional job demand, pay rates and transferable skills. Some decisions within the lattice may result in a move from a low growth to a fast-growing occupation, or into a progression with faster growing occupations or emerging job opportunities. Or, a worker may just want a career change to something that seems more interesting or challenging but still allows them to take advantage of some of their acquired skill set.

Returning to the career lattice for a Childcare Worker, given the various Tier II options let's assume the worker chooses the Social and Human Services Assistant option. This decision could be based on the fact that the Rural Capital Workforce Board can fund vocational training for this occupation since it falls on the Target Occupation list. It could also repre-

sent other personal values not included in the career progression lattice e.g. work environment, desire to enter public sector employment, working conditions and job characteristics. It is impossible to factor in every aspect of a job into a static career progression lattice. But job characteristics should not be ignored. There are many useful tools to help a job seeker better understand job characteristics such as the Occupational Outlook Handbook (<https://www.bls.gov/ooh/>) and Texas Career Check (www.texascareercheck.com).

As the career progression process continues to unfold, the career lattice diagram for Childcare Workers provides four Tier III options; 1) Kindergarten Teacher, 2) Mental Health and Substance Abuse Social Worker, 3) Healthcare Social Worker, and 4) Education Administrator, Pre-K Childcare Center. This Childcare Worker lattice includes a track for the 'people' or 'teaching' skills likely acquired in the Anchor or Tier I occupations. If the worker prefers, the 'human compassion' or 'administration' aspects of their career progression are also included.

For some lattices, especially those in the healthcare field, to make substantially more money requires a significant amount of education and training. On the Childcare Worker career lattice, all Tier III occupations typically require at least a Bachelor's degree. However, as can be true for many public sector-oriented occupations, even with higher education requirements the earnings differential between Tier II and Tier III occupations is important but not pronounced.

Assume our worker continues her journey by moving into the administrative realm. Leveraging her roots as a Childcare Worker and with experience in administrative matters from her role as a Social and Human Services Assistant, she chooses a career move to an Education Administrator, Pre-K Childcare Center. Her resume and skill set should reflect her capabilities to execute the work activities associated with jobs in this occupation. In the Rural Capital Area, the median wage for persons working in this occupation is roughly \$46,900; which is a good salary and much improved from her wages as a Childcare Worker. However, to reach this goal she needs to complete a Bachelor's degree, which means that an immediate career move may not be possible. But at least there is a recognizable career objective.

Her next move on the lattice is also a challenge. All Tier IV occupations on the lattice typically require a Bachelor's or Master's degree to be competitive for available jobs. Several of them also require experience on the job. Whether the education or training investment is worthwhile will be a critical career decision for our worker. However, the skill-based career lattice gives the worker the necessary data to estimate a labor market-based return on educational investment, potential earnings increases, and the length of time it may take to fully amortize the cost of additional education. In the case of becoming qualified for the Tier IV occupation of Education Administrator, Elementary and Secondary, our worker would need to complete a Master's degree. However, the potential earnings gain of \$36,700 per year could justify the added time and expense of getting the degree.

Occupational Mobility and Formal Education

Since many occupations on the lattice will require additional postsecondary education, it is important to understand which education programs lead to employment in those occupations and which regional institutions offer those programs. Because the career progressions are built around the notion of transferable skills, in an ideal world identified skill deficits to reach a higher tier occupation would be addressed through skill-centric, competency-based programs. However, in the absence of such options, skill deficits can be addressed through regular workforce or academic instructional curricula.

The chart below illustrates several local training options to help a worker move to one of the identified Rural Capital Area Target Occupations. Although formal education is not always the only route to occupational mobility, this example shows that there are generally formal training options that can facilitate the process²¹. The chart illustrates that there are multiple educational programs, and multiple award levels that can serve to address skill deficits.

²¹ This illustration is only a visual snapshot from a more extensive database that shows the related CIP programs associated with each of the Rural Capital Area Target Occupations. Ideally, competency-based curricula could be developed that taught a finite number of skills within a short time period that a worker could use to address their skill deficit. The table includes the most likely formal education and training options.

Rural Capital Target Occupations Linked to Regional Educational Programs

SOC	Target Occupation	CIP Code	2010 CIP Title	Institution name	Award Level
Accountants and Auditors					
13-2011	Accountants and Auditors	52.0101	Business/Commerce, General.	Austin Community College District	Associate's degree
13-2011	Accountants and Auditors	52.0301	Accounting.	Austin Community College District	Associate's degree
13-2011	Accountants and Auditors	52.0101	Business/Commerce, General.	Southwestern University	Bachelor's degree
13-2011	Accountants and Auditors	52.0301	Accounting.	Texas State University	Bachelor's degree
13-2011	Accountants and Auditors	52.0301	Accounting.	Southwestern University	Bachelor's degree
13-2011	Accountants and Auditors	52.0801	Finance, General.	Texas State University	Bachelor's degree
13-2011	Accountants and Auditors	52.0301	Accounting.	Austin Community College District	Certificate: >1 YR & <2 YR
13-2011	Accountants and Auditors	52.0301	Accounting.	Texas State University	Master's degree
13-2011	Accountants and Auditors	30.1601	Accounting and Computer Science	Texas State University	Master's degree
Automotive Body and Related Repairers					
49-3021	Automotive Body and Related Repairers	47.0603	Autobody/Collision and Repair Technology/Technician.	Austin Community College District	Associate's degree
49-3021	Automotive Body and Related Repairers	47.0603	Autobody/Collision and Repair Technology/Technician.	Austin Community College District	Certificate: >1 YR & <2 YR
Automotive Service Technicians and Mechanics					
49-3023	Automotive Service Technicians and Mechanics	47.0604	Automobile/Automotive Mechanics Technology/Technician.	Austin Community College District	Associate's degree
49-3023	Automotive Service Technicians and Mechanics	47.0603	Autobody/Collision and Repair Technology/Technician.	Austin Community College District	Associate's degree
49-3023	Automotive Service Technicians and Mechanics	47.0604	Automobile/Automotive Mechanics Technology/Technician.	Austin Community College District	Certificate: >1 YR & <2 YR
49-3023	Automotive Service Technicians and Mechanics	47.0603	Autobody/Collision and Repair Technology/Technician.	Austin Community College District	Certificate: >1 YR & <2 YR
Bookkeeping, Accounting and Auditing Clerk					
43-3031	Bookkeeping, Accounting and Auditing Clerk	52.0101	Business/Commerce, General.	Austin Community College District	Associate's degree
43-3031	Bookkeeping, Accounting and Auditing Clerk	52.0301	Accounting.	Austin Community College District	Associate's degree
43-3031	Bookkeeping, Accounting and Auditing Clerk	52.0302	Accounting Technology/Technician and Bookkeeping.	Austin Community College District	Associate's degree
43-3031	Bookkeeping, Accounting and Auditing Clerk	52.0101	Business/Commerce, General.	Southwestern University	Bachelor's degree
43-3031	Bookkeeping, Accounting and Auditing Clerk	52.0301	Accounting.	Texas State University	Bachelor's degree
43-3031	Bookkeeping, Accounting and Auditing Clerk	52.0301	Accounting.	Southwestern University	Bachelor's degree
43-3031	Bookkeeping, Accounting and Auditing Clerk	51.0713	Medical Insurance Coding Specialist/Coder.	Austin Community College District	Certificate: >1 YR & <2 YR
43-3031	Bookkeeping, Accounting and Auditing Clerk	52.0301	Accounting.	Austin Community College District	Certificate: >1 YR & <2 YR
43-3031	Bookkeeping, Accounting and Auditing Clerk	52.0302	Accounting Technology/Technician and Bookkeeping.	Austin Community College District	Certificate: >1 YR & <2 YR
43-3031	Bookkeeping, Accounting and Auditing Clerk	30.1601	Accounting and Computer Science	Texas State University	Master's degree
43-3031	Bookkeeping, Accounting and Auditing Clerk	52.0301	Accounting.	Texas State University	Master's degree
Computer Systems Analysts					
15-1121	Computer Systems Analysts	11.0101	Computer and Information Sciences, General.	Austin Community College District	Associate's degree
15-1121	Computer Systems Analysts	11.0901	Computer Systems Networking and Telecommunications.	Austin Community College District	Associate's degree
15-1121	Computer Systems Analysts	11.0201	Computer Programming/Programmer, General.	Austin Community College District	Associate's degree
15-1121	Computer Systems Analysts	27.0303	Computational Mathematics.	Southwestern University	Bachelor's degree
15-1121	Computer Systems Analysts	11.0101	Computer and Information Sciences, General.	Southwestern University	Bachelor's degree
15-1121	Computer Systems Analysts	11.0101	Computer and Information Sciences, General.	Texas State University	Bachelor's degree

Assessing the Potential Economic Impact of Career Upskilling

In the introduction of this report there was a mention of the importance of career upskilling to the economic development community. Economic impact or return on investment (ROI) calculations can be either simple or complex. But because the issue is potential economic impact, rather than measuring actual impact, this assessment will stick to a rudimentary calculation of the direct wage impact of entry-level workers moving from Anchor occupations to Tier I or Tier II occupations.

For this analysis assume a scenario whereby 10 percent of all currently employed persons in the 20 designated Anchor occupations earn entry into a Tier I occupation. The chart below shows the additional wages that would be earned by those individuals, broken out by Anchor occupation. With 84,498 total employed persons in the Rural Capital Area in the 20 Anchor occupations, 10 percent of that total would be 8,450 workers. The average earnings gains (\$6,986) from Anchor occupation to the average Tier I earnings is also displayed. Predictably, occupations with the most entry-level workers combined with the greatest earnings spread between Anchor and Tier I occupations contribute the most overall wage impact.

This approach results in an expected increase in regional wages of just over \$59 million. If those same workers made it to Tier II occupations the gross wage impact would be \$153.6 million. Of course this gross impact calculation does not include a household multiplier effect (induced effect) that would occur as each worker spends their new earnings in their local community. If you add in the roughly 1.50 induced effect household multiplier and assume the majority of the spending occurs locally, the gross economic impact could be closer to \$88.5 million of additional money circulating in the regional economy. Clearly, increasing individual human capital and promoting upward career mobility of the regional labor force can have a significant impact on the entire community.

Rural Capital Area Wage Impact if 10% of Anchor Workers Move to Tier I or Tier II Occupations

Anchor Occupation/Lattice	2018Q4 EMP	Average Earnings Gain FROM Anchor to Tier I	Average Earnings Gain FROM Anchor to Tier II	Total Earnings Increase to Tier I	Total Earnings Increase to Tier II
(A)	(B)	(C)	(D)	(E)	(F)
Total, All Anchor Occupations (10% = 8,450 clients)	84,498	\$6,986	\$18,183	\$59,030,303	\$153,641,446
Secretaries & Admin Assistants, Ex. Legal/Medical	20,670	\$3,520	\$23,900	\$7,275,840	\$49,401,300
Personal Care Aides	9,078	\$6,880	\$25,960	\$6,245,664	\$23,566,488
Childcare Workers	8,546	\$6,320	\$15,380	\$5,401,072	\$13,143,748
Construction Laborers	12,658	\$3,680	\$16,520	\$4,658,144	\$20,911,016
Computer Network Support Specialists	2,434	\$17,200	\$20,797	\$4,186,480	\$5,061,990
Team Assemblers	4,591	\$8,240	\$19,820	\$3,782,984	\$9,099,362
Cleaners of Vehicles and Equipment	2,855	\$11,200	\$22,520	\$3,197,600	\$6,429,460
Data Entry Keyers	2,152	\$12,000	\$22,720	\$2,582,400	\$4,889,344
Light Truck or Delivery Services Drivers	6,165	\$3,780	\$15,040	\$2,330,370	\$9,272,160
Hotel, Motel, and Resort Desk Clerks	1,988	\$9,580	\$24,540	\$1,904,504	\$4,878,552
Medical Assistants	4,188	\$4,140	\$15,840	\$1,733,832	\$6,633,792
Home Health Aides	2,695	\$5,840	\$20,860	\$1,573,880	\$5,621,770
Electrical and Electronic Equipment Assemblers	3,155	\$2,580	\$9,700	\$813,990	\$3,060,350
Tire Repairers and Changers	855	\$7,440	\$17,820	\$636,120	\$1,523,610
Electricians Helpers	789	\$7,540	\$14,580	\$594,906	\$1,150,362
Carpenters Helpers	231	\$13,040	\$21,740	\$301,224	\$502,194
Medical Equipment Preparers	275	\$10,660	\$24,300	\$293,150	\$668,250
File Clerks	951	\$2,480	\$8,360	\$235,848	\$795,036
Extraction Workers Helpers	131	\$6,980	\$18,680	\$91,438	\$244,708
Desktop Publishers	91	\$9,660	\$26,320	\$87,906	\$239,512

Limitations and Challenges

The career lattice approach has many strengths, both in terms of practical application and the ability to take advantage of available labor market information. But it is not without limitations.

The lattices are built around skill profiles developed for each SOC occupation. Ground-breaking original work from the Texas Workforce Commission and extensive enrichments from TSTC/*SkillsEngine* have resulted in an exemplary DWA-centric skill library upon which this work is based. But the federal SOC occupations have very terse definitions with limited narrative discussion of what workers actually do in each occupation. The thin descriptive text makes it more difficult to fully explore the transferable skills that connect various occupations using text parsing, natural language processing techniques.

A second challenge is not methodological but a simple artifact of the labor market itself. Especially in smaller labor markets, the breadth and diversity of job opportunities may be limited. The universe of occupations covered in the Chmura Economics database for the Rural Capital Area numbers 822 occupations. In the Rural Capital Area workforce board region Chmura Economics estimates a total employment of 351,364 in the first quarter 2019. Based on total employment, 22.1 percent of all workers are concentrated in the top 10 occupations. The top 50 largest occupations in the region cover almost 54.9 percent of total employment. Similarly, the top 100 largest occupations cover 70.6 percent of total employment. Eighty percent of all employment is found in the top 157 occupations. To describe this phenomena in another way, over 80 percent of the region's employment can be found in just under 20 percent of all the occupational titles in the employment universe. Needless-to-say, occupational employment and opportunities are highly concentrated in a relatively small number of occupational titles.

But such occupational concentrations are evident even in statewide Texas. For 2019, 20.5 percent of employment and 25.8 of all 2019-2029 projected job openings are concentrated in just 10 occupational titles²². Only 38 occupations are responsible for 50 percent of all projected openings and 75 percent of all projected openings are in just 118 occupations. In this labor market context, a career lattice that lists 16 occupations across 4 tiers is likely to include some occupations for which there may be limited regional job demand.

²² Economic Modeling (EMSI)
Texas long-term projections
2019-2029

In 'real life', some occupations may be connected not by a multitude of similar skills but by a handful of very critical skills. For example, Health Information Technologists sit at the nexus of healthcare, information technology and administrative occupations. The SOC title Billing and Posting Clerk includes jobs as Medical Reimbursement Specialists, which has many transferable skills with Health Information Technologist. These two occupations are not linked in the analysis feeding the career lattice because their DWA profiles don't show extensive commonality. However, they do share a small number of highly transferable skills that should be considered in a career progression. Using the *SkillsEngine* Relationship variable improved our ability to deal with this issue, but it remains an area in need of further refinement.

At the upper tiers of the lattices, one would expect to see supervisory and managerial occupations emerge. Clearly, those with technical expertise in related fields and work experience (gained by moving up the lattice) are more likely to supervise the work of others in related

²³ Although these dimensions of management are not unique, these specific categories are adapted from *Triggers: Creating Behavior That Lasts*, Marshall Goldsmith, Crown Publishing, 2015

²⁴ For Tier III and Tier IV occupational analysis, an occupational weighting system was implemented that attached higher significance to the DWAs related to occupations that had higher levels of education, and which had 'supervisor', 'manager', 'administrator', or 'superintendent' in their titles. The scale range was 1-20 (non-proportionate) with a weight of 20 being attached to occupations with a CER rating of Doctorate/Professional Degree. Occupations with a CER rating of Bachelor's degree were weighted 12. Similarly, occupations containing the keyword 'manager' or 'superintendent' were given weights of 20, while occupations with the keywords 'supervisor' or 'administrator' were given a weight of 12. The weighting methodology is an imperfect but effective approach to bringing forward supervisory occupations as part of a natural career progression. TSTC's C4EO/*SkillsEngine* is investigating the addition of a managerial domain for all DWA skill statements to potentially alleviate this issue.

²⁵ Employers tend to use job titles that are unique to their own operations and frequently do not match exactly the titles that appear in the federal Standard Occupational Classification taxonomy. The workforce and education system is always challenged to translate these unique 'payroll' job titles to a matching SOC occupation title. The interviews conducted during this project unveiled many such titles, some of which might be classified under the 'All Other' option. We recommend that additional efforts be made to crosswalk the payroll job titles unearthed in the employer interviews into appropriate SOC occupations for purposes of positioning them on a career lattice.

occupations. However, the DWA domain is designed to describe specific work activities performed and is less concise on aspects of an occupation that might fall within a management domain, i.e. Directing, Coaching/Mentoring, Supporting/Motivation, and Delegating²³.

Although the DWA library has many skill statements that fall in this category, from a transferable skills perspective they most often emerge when compared with other supervisory or management jobs. A weak link for career progression analysis is the transition for front line technical workers crossing over for the first time into a supervisory/management domain. For this project, managerial and supervisory occupations were sometimes inserted onto a lattice through manual intervention, as appropriate²⁴.

Upward mobility under or within the same occupational title is not uncommon. For some occupations, such as Webmaster, upward movement under the same general occupational title is as much the norm as changing to a different occupational title or career field. Thus, it is often difficult to document career progressions given limitations in the federal SOC occupational taxonomy, which has fewer detailed occupational titles for some categories of jobs.

For example, in the Computer Design Services industry one might have the job title of Web Developer but move upward within a company or in and out of different companies by adding to their skill set and capabilities – either formally or informally. They may hold other job titles such as Interface Designer, Internet Architect, Usability Specialist or Webmaster that offer increased pay or prestige – but their formal occupational title might still be classified as Web Developer in the federal SOC taxonomy. Therefore, the career lattice for many occupations could include the same SOC occupational title in the second, third or fourth tier of job possibilities. However, each higher level would represent additional duties and responsibilities, greater technical expertise requirements, and concomitantly higher pay. This is not so much a flaw in the career lattice concept as it is a limitation on data collected for much more detailed job titles, and a reflection of possible career progressions even within the same occupational category.

Another data limitation relating to the SOC taxonomy is the fact that roughly 10 percent of all occupational titles are miscellaneous or 'All Other' categories, encompassing employment from a wide array of payroll job titles for which data are not separately collected. Using these 'All Other' occupational titles in a personal career lattice is imprecise at best and, while it may fit some profiles, the titles tend to be less actionable for career development planning. When 'All Other' occupational titles are included in a career lattice, sample job titles that fall under that title are also listed²⁵.

The challenge of occupational mobility between Anchor occupations and a Target Occupation is not the same for every personal journey. One of the most significant limitations to this type of analysis is that every person is on their own unique journey. Each person has skill strengths and deficiencies that transcend occupational titles. We've all heard of people who are 'math whizzes' or 'who can fix anything' regardless of formal training. There are many computer programmers and web developers whose formal training or passion is in music, creative writing or other non-STEM disciplines. All of which translates into the fact that one person's journey within a lattice will not mirror the journey of someone else – even when they start at the same Anchor occupation with the same aspirations.

None-the-less, one of the enticing aspects to skill-based career progressions is that the lattice is built around identifiable skill statements. In this project, one objective was to identify

potential paths to Rural Capital Area Target Occupations from 20 different entry-level or Anchor occupations. In some cases, the Target Occupation did not appear on a lattice until Tier III or Tier IV, while others represented just one upward move. Interestingly, among all Anchor-to-Target Occupation pairs in which the move is from Anchor to Tier I on a lattice, the easiest transition (the pair with the most skill commonality) is between Desktop Publishers and Graphic Designers, and between Light Truck and Delivery Services Driver and Heavy Tractor-Trailer Truck Driver. The next easiest transition is between a Computer Network Support Specialist and a Web Developer. The two most challenging Anchor to Tier I transitions are between Data Entry Keyers and Bookkeeping, Accounting and Auditing Clerks and an Electrical and Electronic Equipment Assembler and a Maintenance and Repair Worker, General. It can be argued that pairs with high non-match scores should not be connected in the first place and alternate Anchor occupations identified. As one might imagine, for pairs in which the Target Occupation did not appear until Tier III or Tier IV, the initial non-match score can be high but will be tempered as additional skills are acquired along the journey through jobs in Tier I and Tier II.

Getting a job, building qualifications, and forging a career progression, is not always about technical skills. In the interviews with Rural Capital Area employers the importance of workplace essential skills such as verbal communication, human interaction, reliability and trainability were frequently repeated. For many employers, the ideal worker is one with an appropriate formal academic background, related work experience, applicable technical skills, positive workplace essential skills, and often basic digital information processing skills. The hiring authority seeks to align the job requirements and organizational culture with the candidate's capabilities across these various dimensions. In solving the puzzle that is getting the right candidate for the job, employers often emphasize certain attributes such as attitude and judgment that transcend work activity mastery. Thus, getting a job and then getting the next job, typically requires other, often less tangible skills than can be represented on a career lattice diagram.

Finally, this skill-based career lattice model does not pretend that moving from traditional secondary labor market jobs to primary labor market jobs and self-sufficiency is an easy endeavor. It is not. The lattices communicate the fact that continual skill acquisition is the secret sauce to higher earnings. It reinforces the notion that lifelong learning is critical to upward career mobility.

Per the career lattice concept, navigating a personalized lattice requires individual initiative and determination on the part of the worker - and probably some financial and emotional support along the way. It also represents a vote for increased competency-based instruction (CBI) opportunities within higher education - especially for returning students, dislocated workers, or those already in the workplace a.k.a. incumbent workers²⁶. It also encourages workforce and related training intermediaries to think about skill acquisition as the common currency for contract training investments.

The skill-based career lattice model provides clear, actionable, decision-critical information to help inform and guide students, dislocated workers and other labor market participants through the maze that is the American labor market. As these career progression lattices demonstrate, navigating an upward career path is possible, no matter where you start. There is a bright future ahead for anyone willing to take the journey!

"The opportunities that exist in your zip code might be very different from the opportunities that exist across the country. So, you have to focus on the things you can control when it comes to work." The things in your control include where you decide to live, what skill you decide to pursue, and how hard you work."

Mike Rowe,
Host/Producer of Dirty Jobs

²⁶ There are many emerging models for micro-credentials, badges, and other short program offerings. Coursera, for example, offers a series of online 'specializations' that include between 5 and 10 courses and fall in subject areas such as Value Chain Management, Big Data, Business Foundations, and Data Science. CBI will also become more critical as older students return to higher education for up-skilling opportunities - preferably to be accomplished in the shortest possible timeframe.

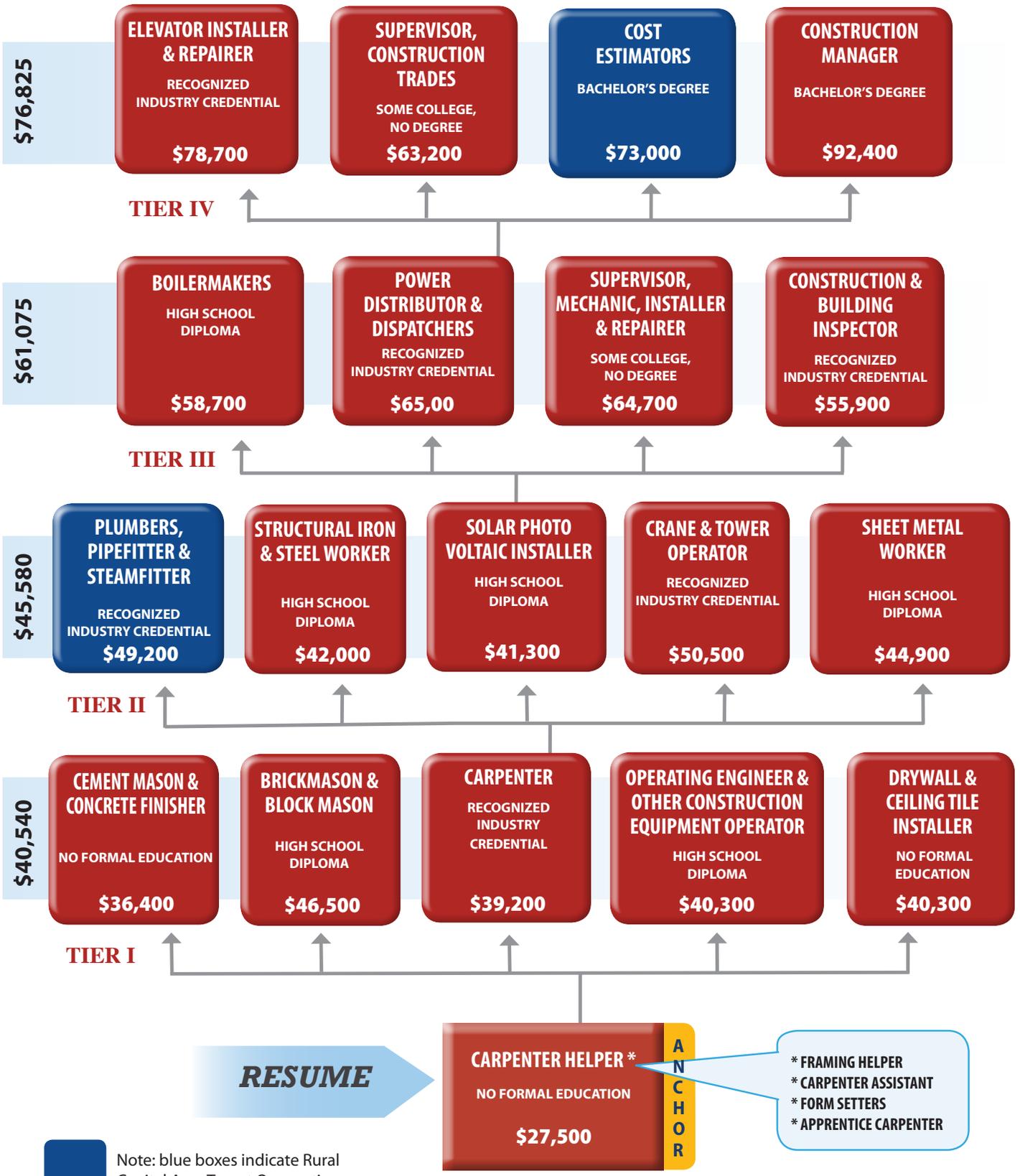
Rural Capital Area Career Progression Lattices

The twenty (20) lattice diagrams depicted in this report each start with an Anchor occupation. The objective was to delineate possible, skill-based career pathways for workers starting in entry-level occupations. Each of these lattice diagrams includes one or more Target Occupations identified by the Rural Capital Area as having above average employment and wage opportunity in the region. The Target Occupations are illustrated by blue boxes among the many occupational possibilities on each lattice. Because a significant focus of the Rural Capital Area Board workforce development mission is to prioritize career and training opportunities for sub-baccalaureate jobs, most – but not all – of the Target Occupations typically require less than a Bachelor’s degree.

The table below lists each lattice based on the Anchor occupation. It also shows any Target Occupations that fall among any of the lattice tiers.

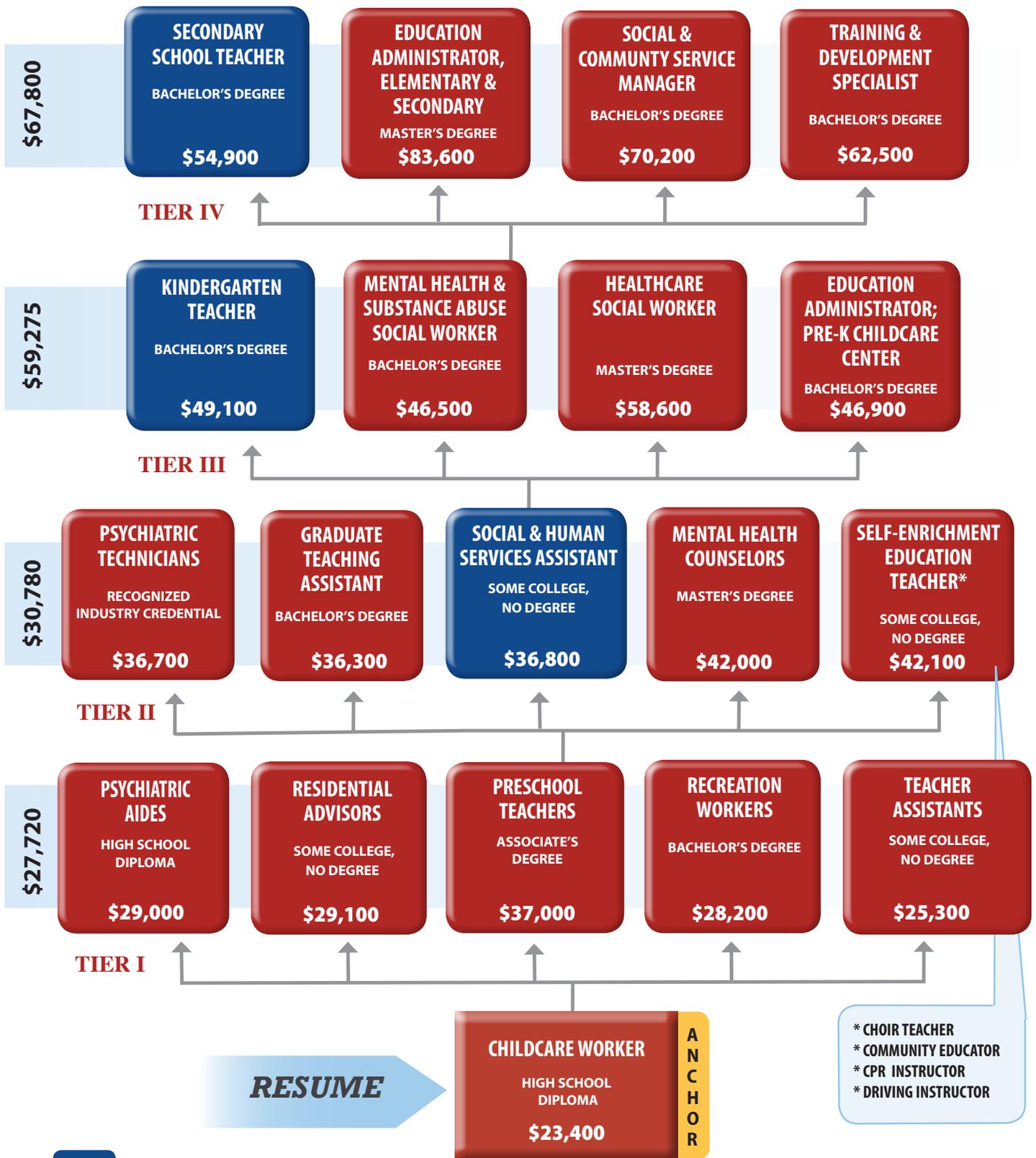
Target Occupations by Lattice Anchor Occupation				
Anchor Occupational Title	Lattice Target Occupation	Lattice Target Occupation	Lattice Target Occupation	Lattice Target Occupation
Carpenter Helpers	Plumbers, Pipefitters, and Steamfitters	Cost Estimators		
Childcare Workers	Social and Human Service Assistants			
Cleaners of Vehicles and Equipment	Automotive Service Technicians and Mechanics	Automotive Body and Related Repairers	Heating, A.C., & Refrigeration Mechanics and Installers	Industrial Machinery Mechanics
	Service Unit Operators, Oil, Gas, and Mining			
Computer Network Support Specialists	Web Developers	Database Administrators	Web Developers	Computer Systems Analysts
	Management Analysts	Software Developers, Applications	Information Security Analysts	
Construction Laborers	Service Unit Operators, Oil, Gas, and Mining	Rotary Drill Operators, Oil and Gas	Plumbers, Pipefitters, and Steamfitters	Cost Estimators
Data Entry Keyers	Computer User Support Specialist	Bookkeeping, Accounting, and Auditing Clerks	Graphic Designers	Accountants and Auditors
Desktop Publishers	Graphic Designers			
Electrical & Electronic Equipment Assemblers	Maintenance and Repair Workers, General	Heating, A.C., & Refrigeration Mechanics and Installers	Electricians	Machinists
	Electrical Power-Line Installers and Repairers			
Electrician Helpers	Maintenance and Repair Workers, General	Industrial Machinery Mechanics	Heating, A.C., & Refrigeration Mechanics and Installers	Electricians
Extraction Worker Helpers	Service Unit Operators, Oil, Gas, and Mining	Rotary Drill Operators, Oil and Gas	Plumbers, Pipefitters, and Steamfitters	Cost Estimators
File Clerks	Medical Records and Health Information Technicians	Bookkeeping, Accounting, and Auditing Clerks	Human Resources Specialists	
Home Health Aides	Medical Assistants	Licensed Practical and Licensed Vocational Nurses	Dental Assistants	Radiologic Technologists
	Respiratory Therapists	Physical Therapist Assistants	Registered Nurses	Medical and Clinical Laboratory Technologists
	Dental Hygienists			
Hotel and Motel Desk Clerks	Bookkeeping, Accounting, and Auditing Clerks	Automotive Body and Related Repairers		
Light Truck and Delivery Services Drivers	Heavy and Tractor-Trailer Truck Drivers			
Medical Assistants	Dental Assistants	Surgical Technologists	Medical and Clinical Laboratory Technicians	Medical Records and Health Information Technicians
	Dental Hygienists			
Medical Equipment Preparers	Surgical Technologists	Dental Assistants	Radiologic Technologists	Medical and Clinical Laboratory Technicians
	Licensed Practical and Licensed Vocational Nurses	Registered Nurses		
Personal Care Aides	Medical Assistants	Physical Therapist Assistants	Licensed Practical and Licensed Vocational Nurses	Dental Assistants
	Social and Human Service Assistants	Registered Nurses	Dental Hygienists	
Secretaries and Administrative Assistants	Medical Records and Health Information Technicians	Human Resources Specialists	Paralegals and Legal Assistants	Management Analysts
Team Assemblers	Welders, Cutters, Solderers, and Brazers	Machinists	Service Unit Operators, Oil, Gas, and Mining	Industrial Machinery Mechanics
	Electrical Power-Line Installers and Repairers			
Tire Repairers and Changers	Automotive Service Technicians and Mechanics	Maintenance and Repair Workers, General	Heating, A.C., & Refrigeration Mechanics and Installers	Industrial Machinery Mechanics

CARPENTER HELPER

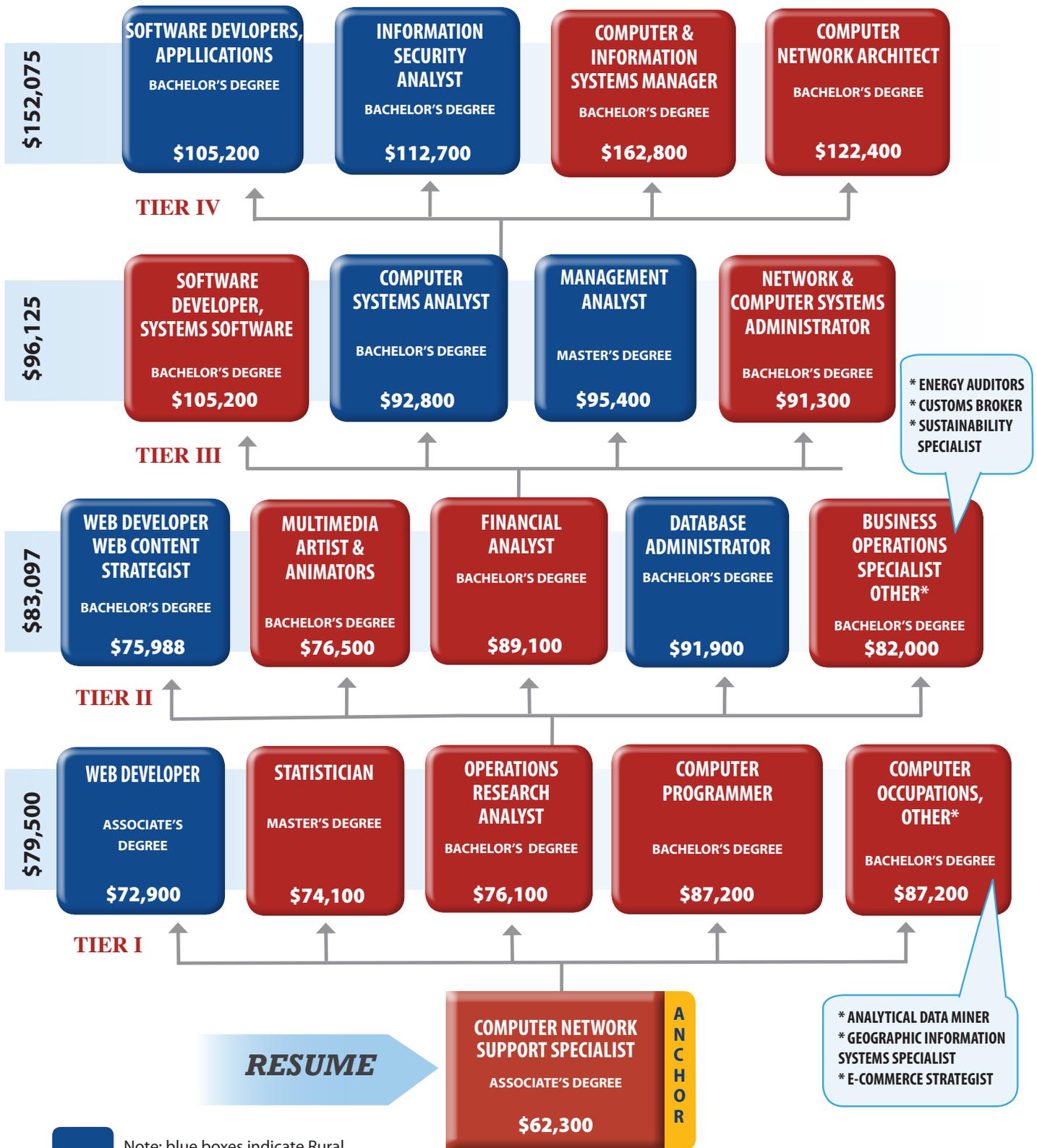


Note: blue boxes indicate Rural Capital Area Target Occupation

CHILDCARE WORKER

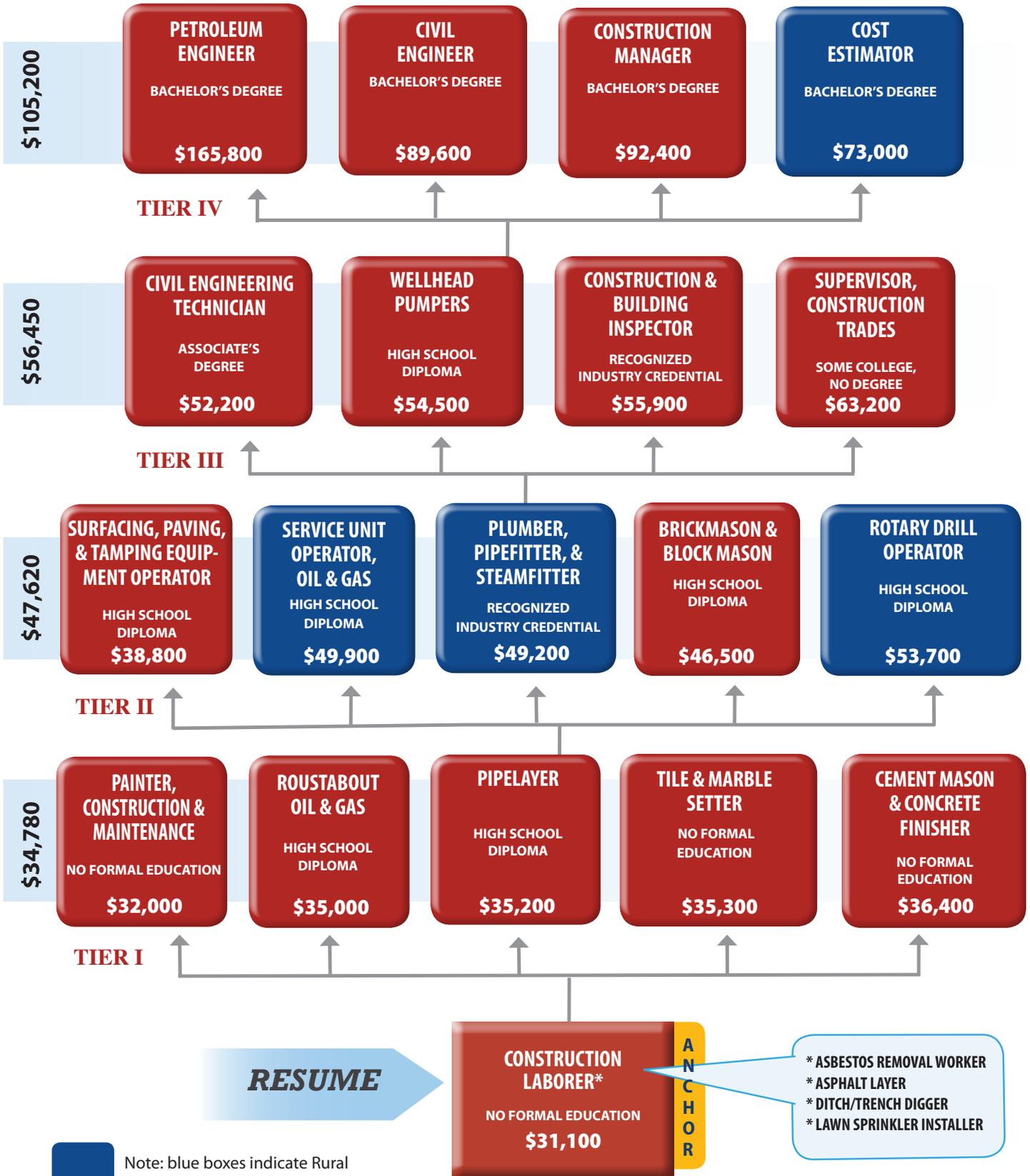


Note: blue boxes indicate Rural Capital Area Target Occupation

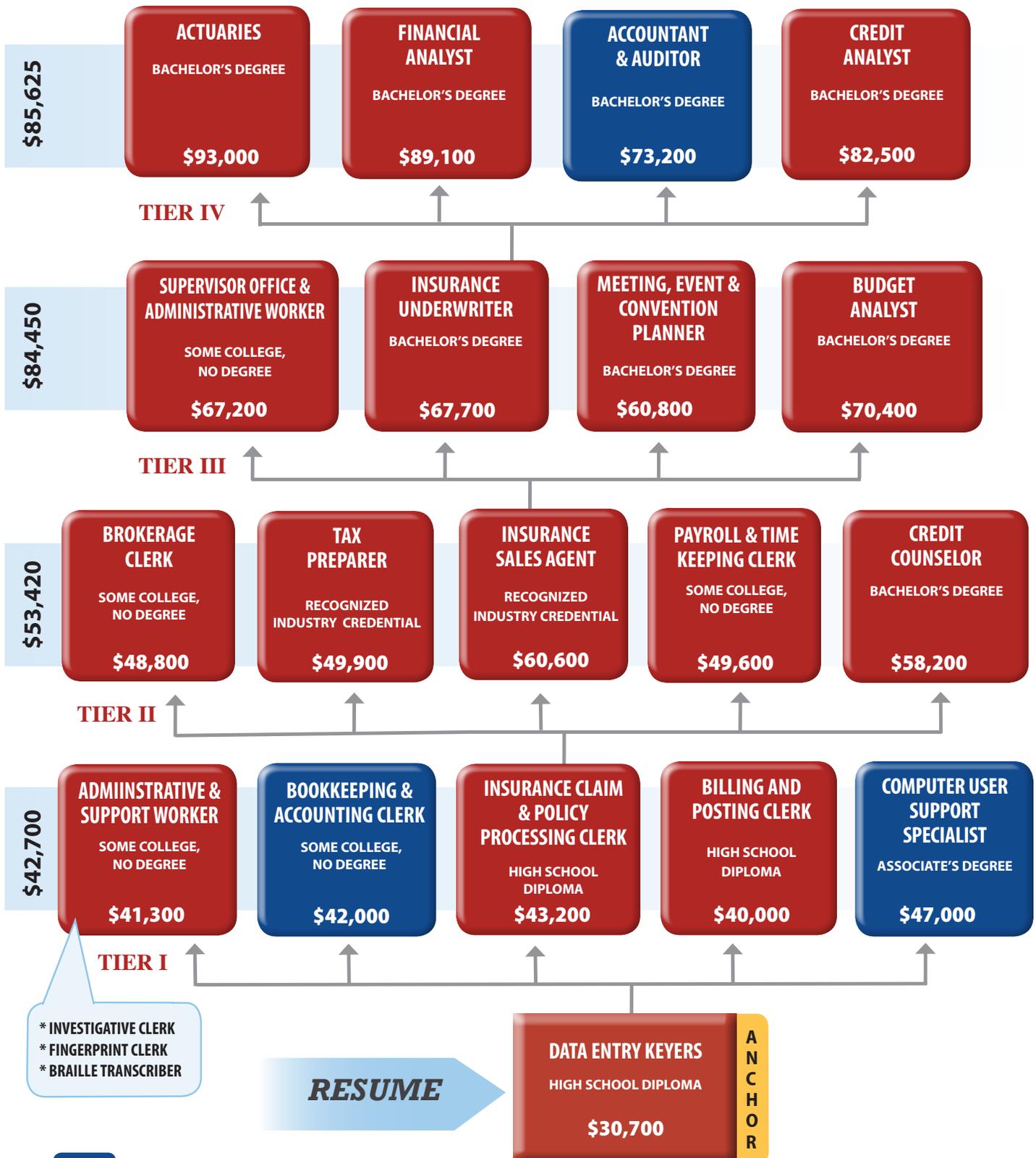


Note: blue boxes indicate Rural Capital Area Target Occupation

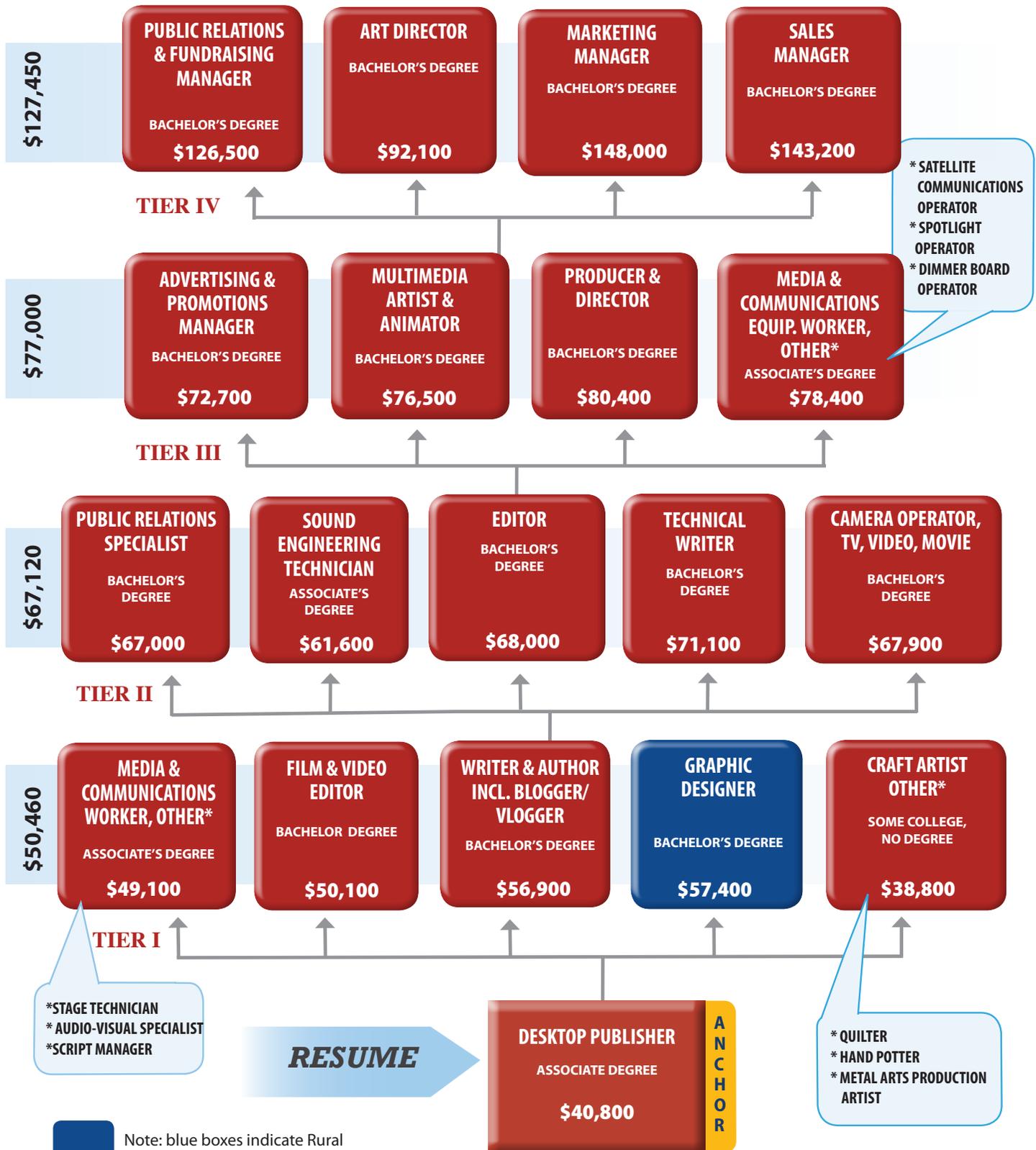
CONSTRUCTION LABORERS



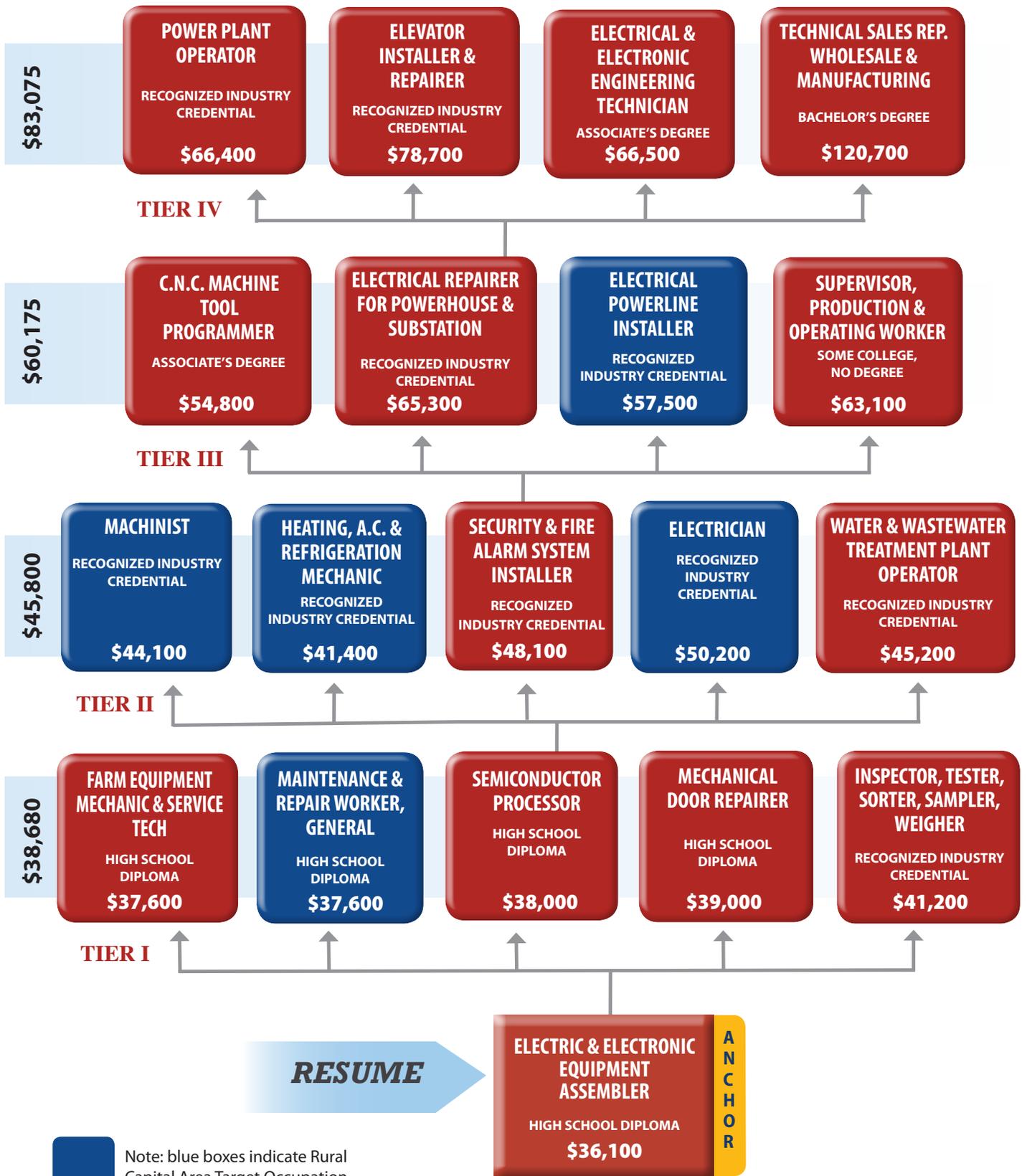
DATA ENTRY KEYERS



DESKTOP PUBLISHER

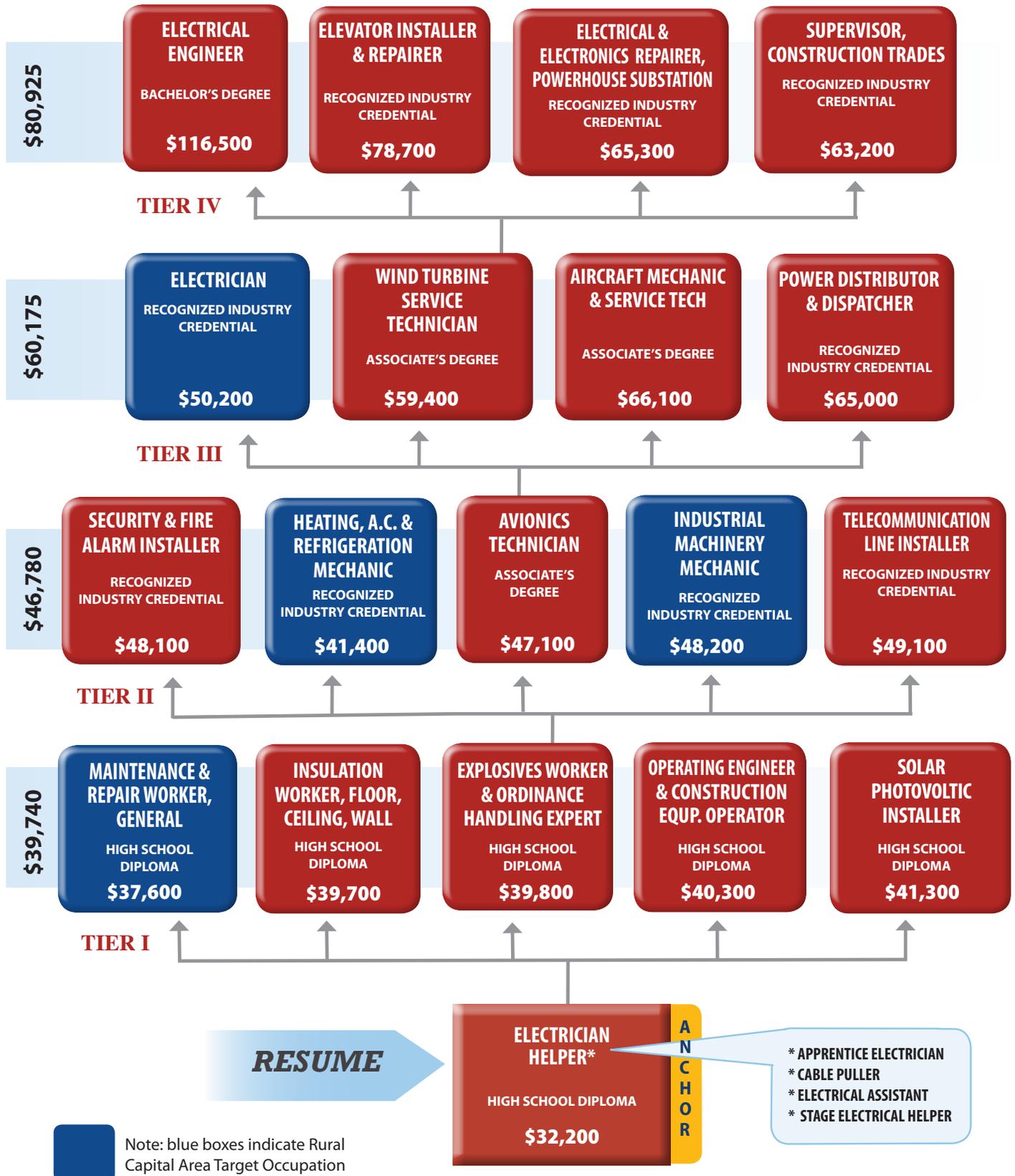


Note: blue boxes indicate Rural Capital Area Target Occupation

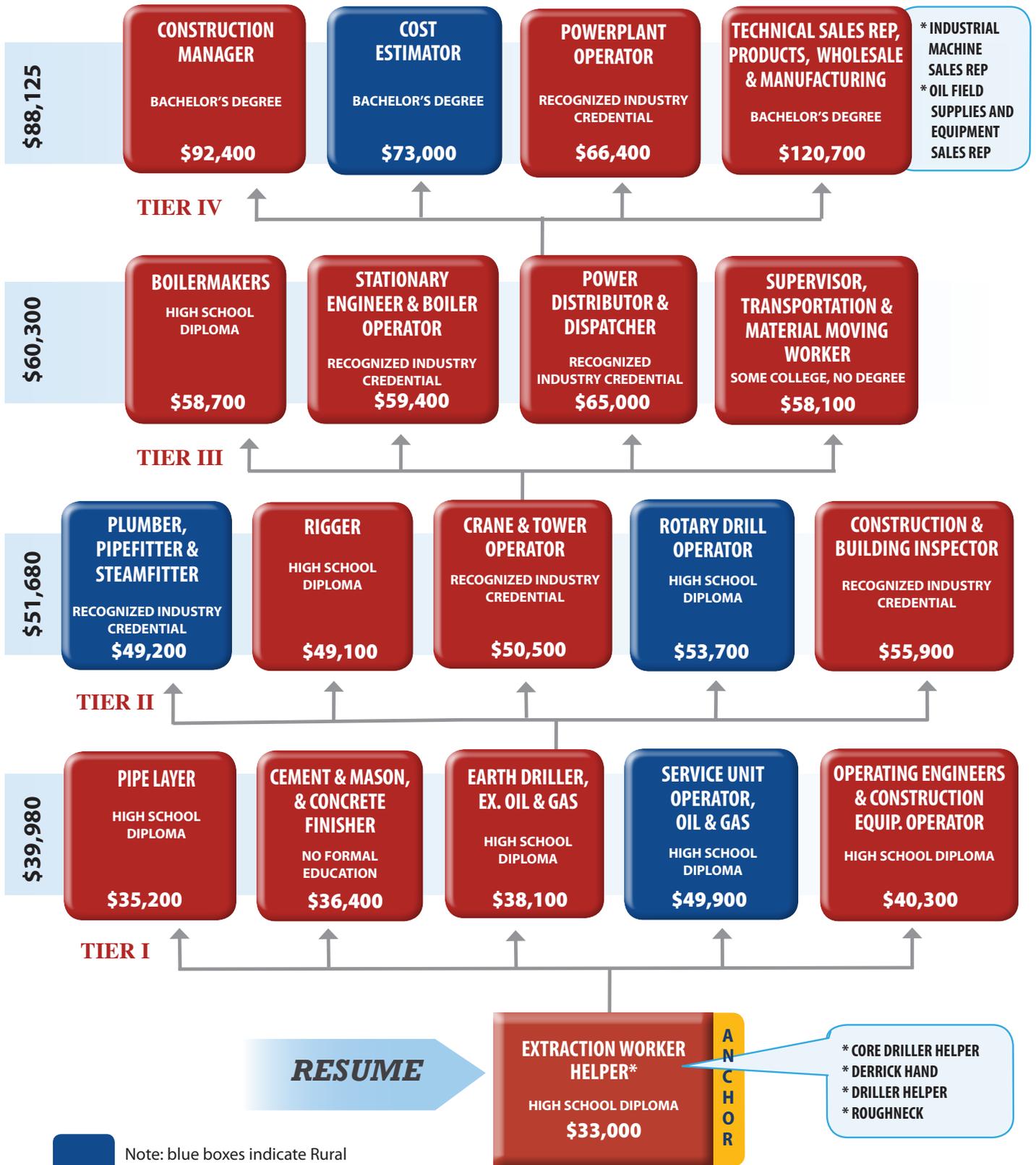


Note: blue boxes indicate Rural Capital Area Target Occupation

ELECTRICIAN HELPER

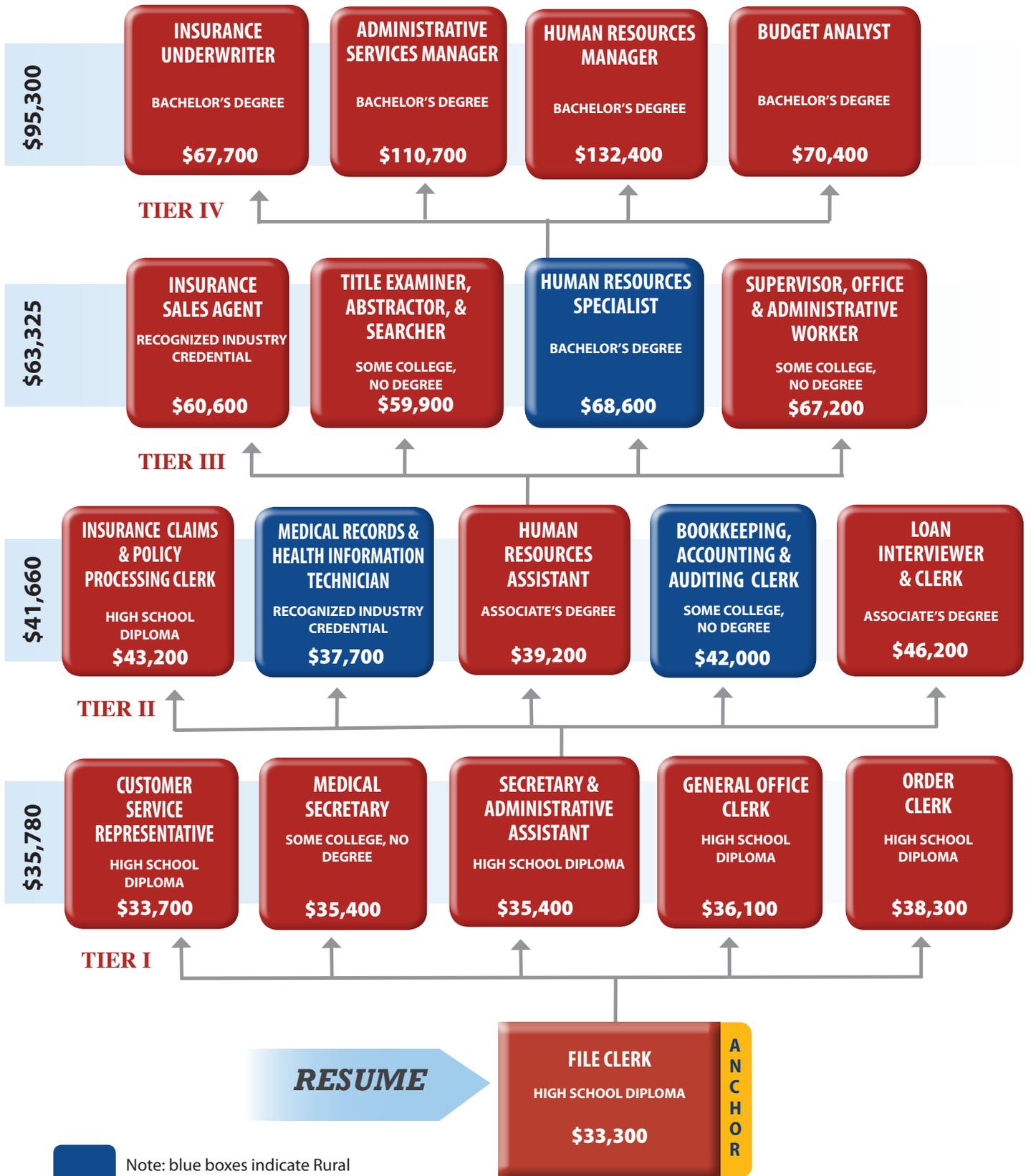


EXTRACTION WORKER HELPER

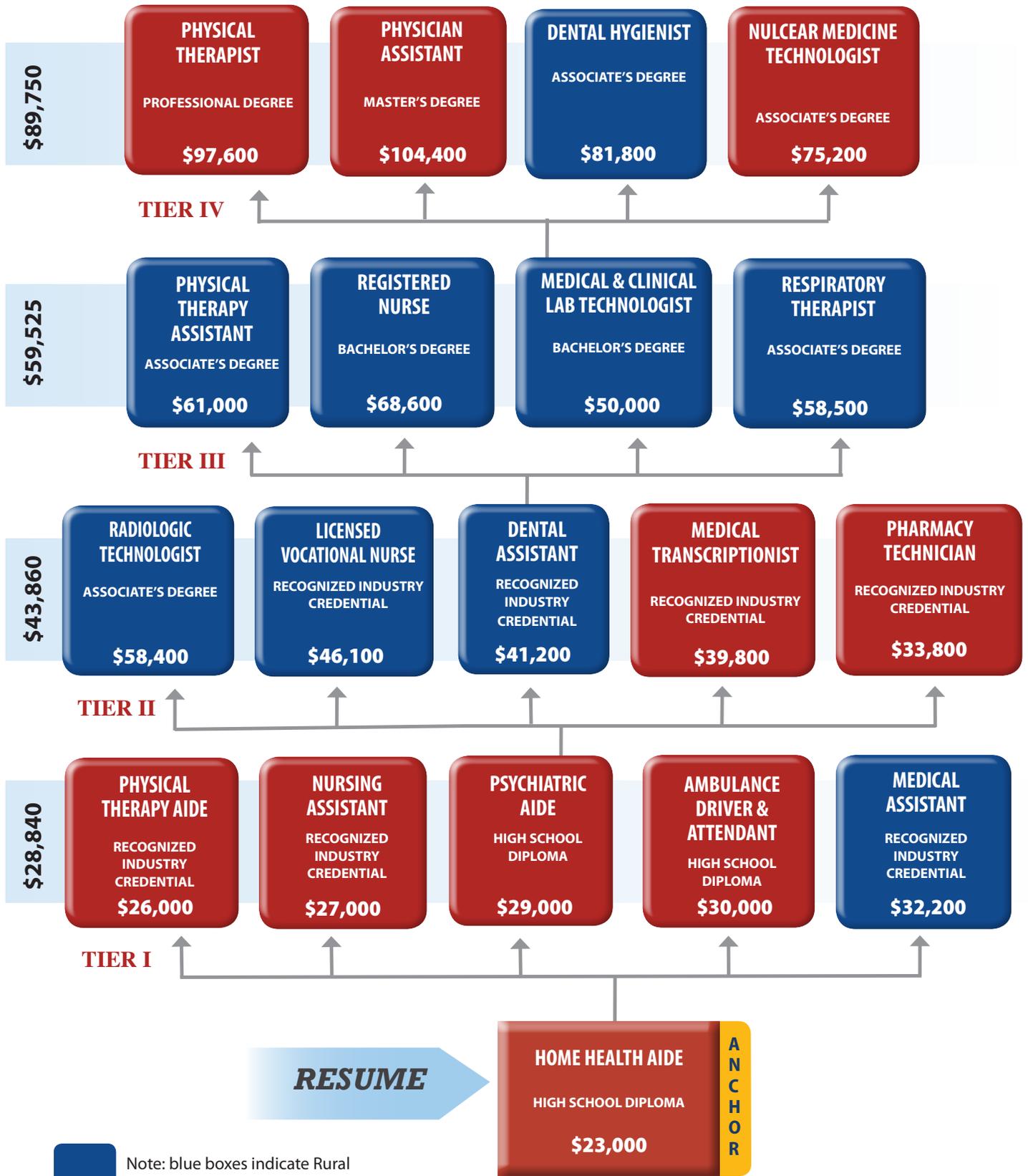


Note: blue boxes indicate Rural Capital Area Target Occupation

FILE CLERK

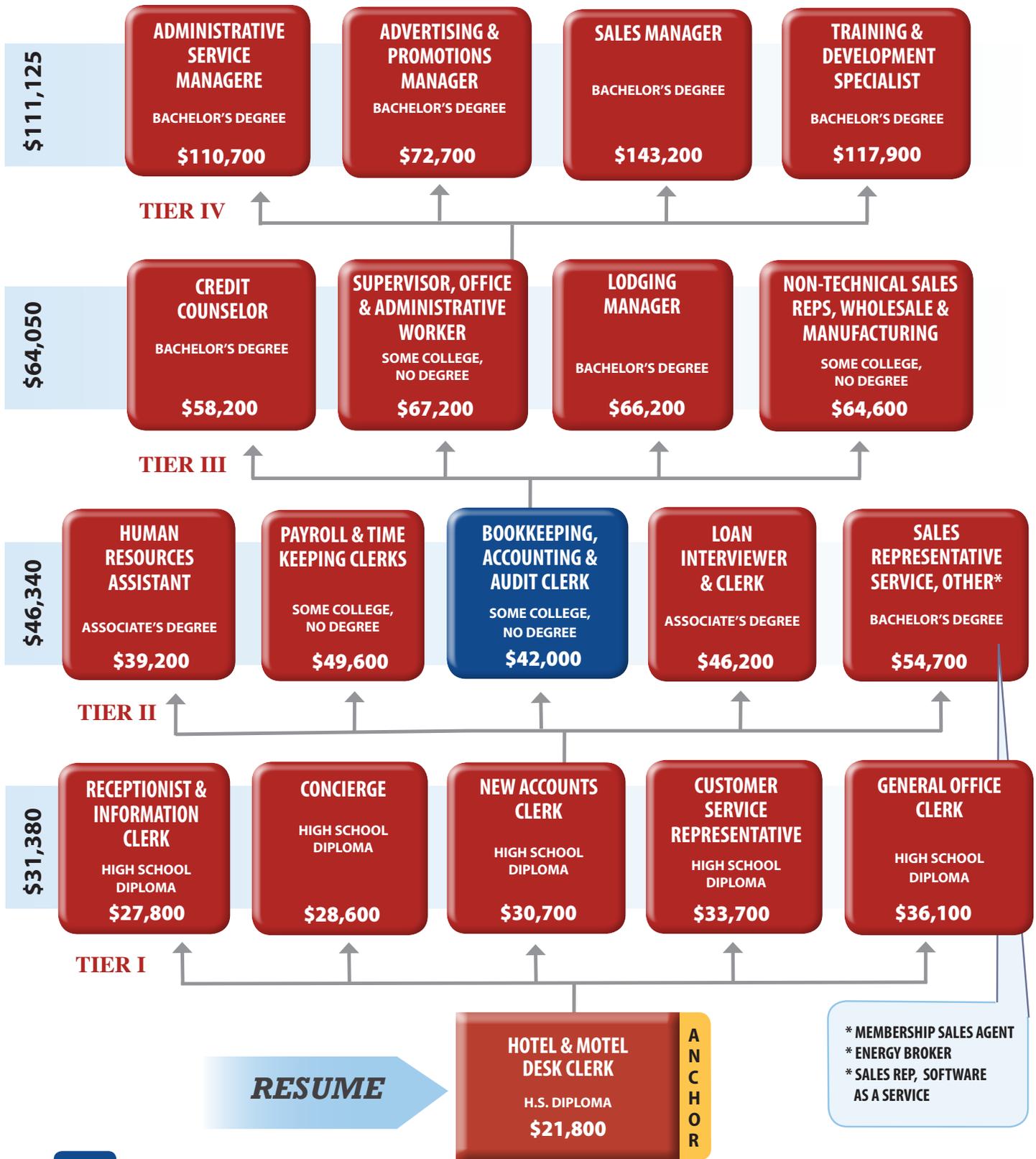


Note: blue boxes indicate Rural Capital Area Target Occupation



Note: blue boxes indicate Rural Capital Area Target Occupation

HOTEL & MOTEL DESK CLERK

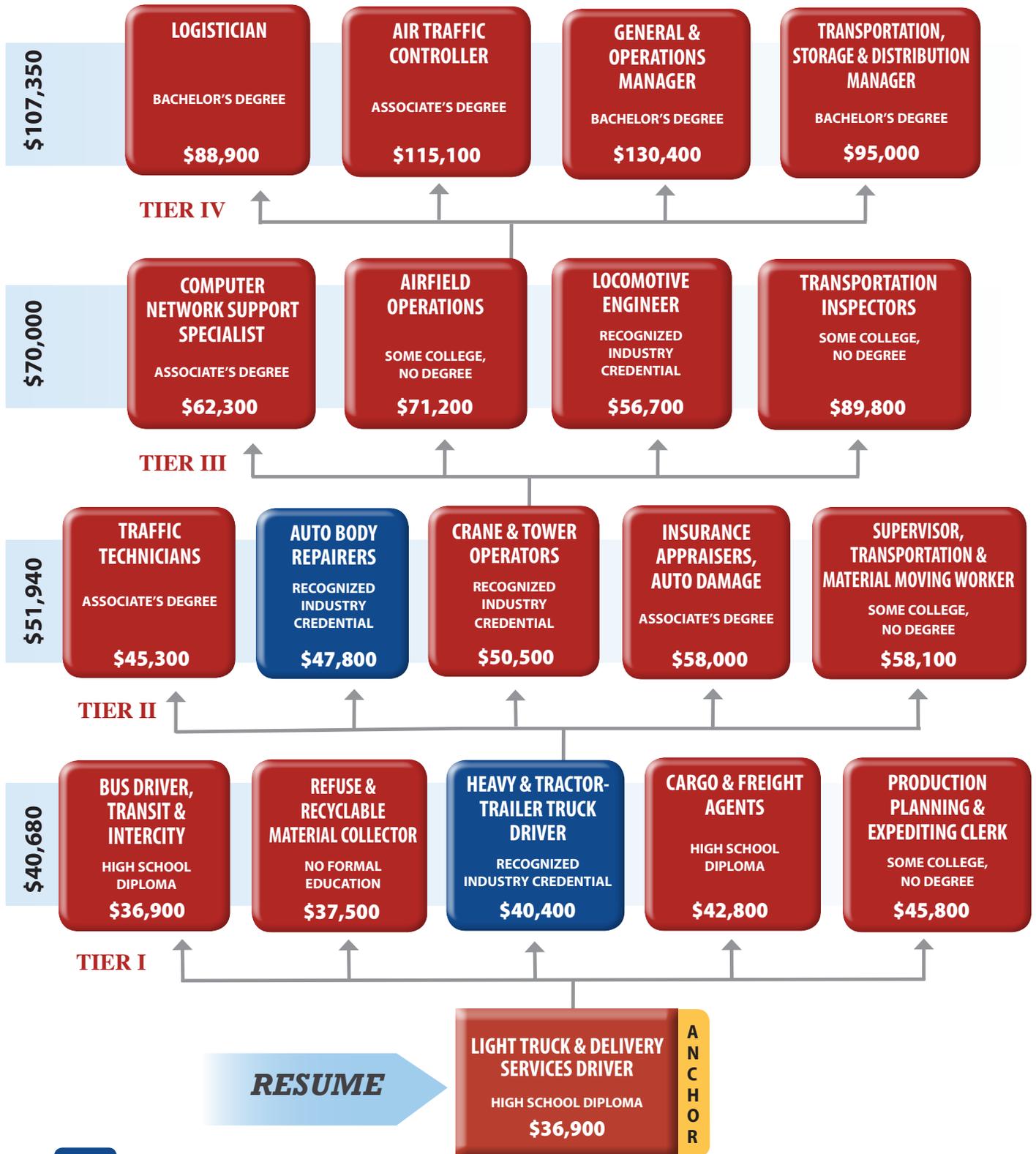


* MEMBERSHIP SALES AGENT
 * ENERGY BROKER
 * SALES REP, SOFTWARE AS A SERVICE

Note: blue boxes indicate Rural Capital Area Target Occupation

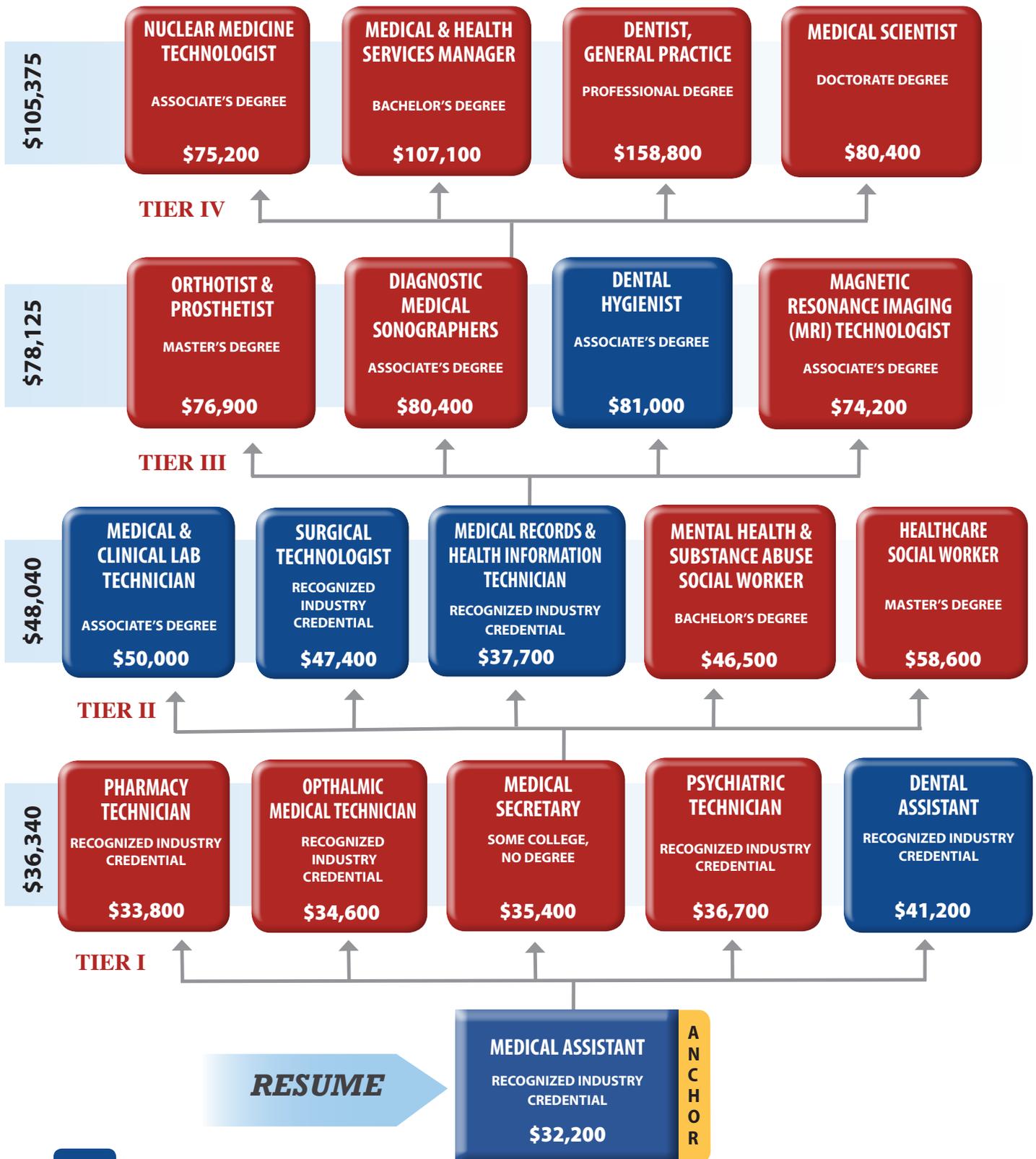


LIGHT TRUCK & DELIVERY SERVICES DRIVER



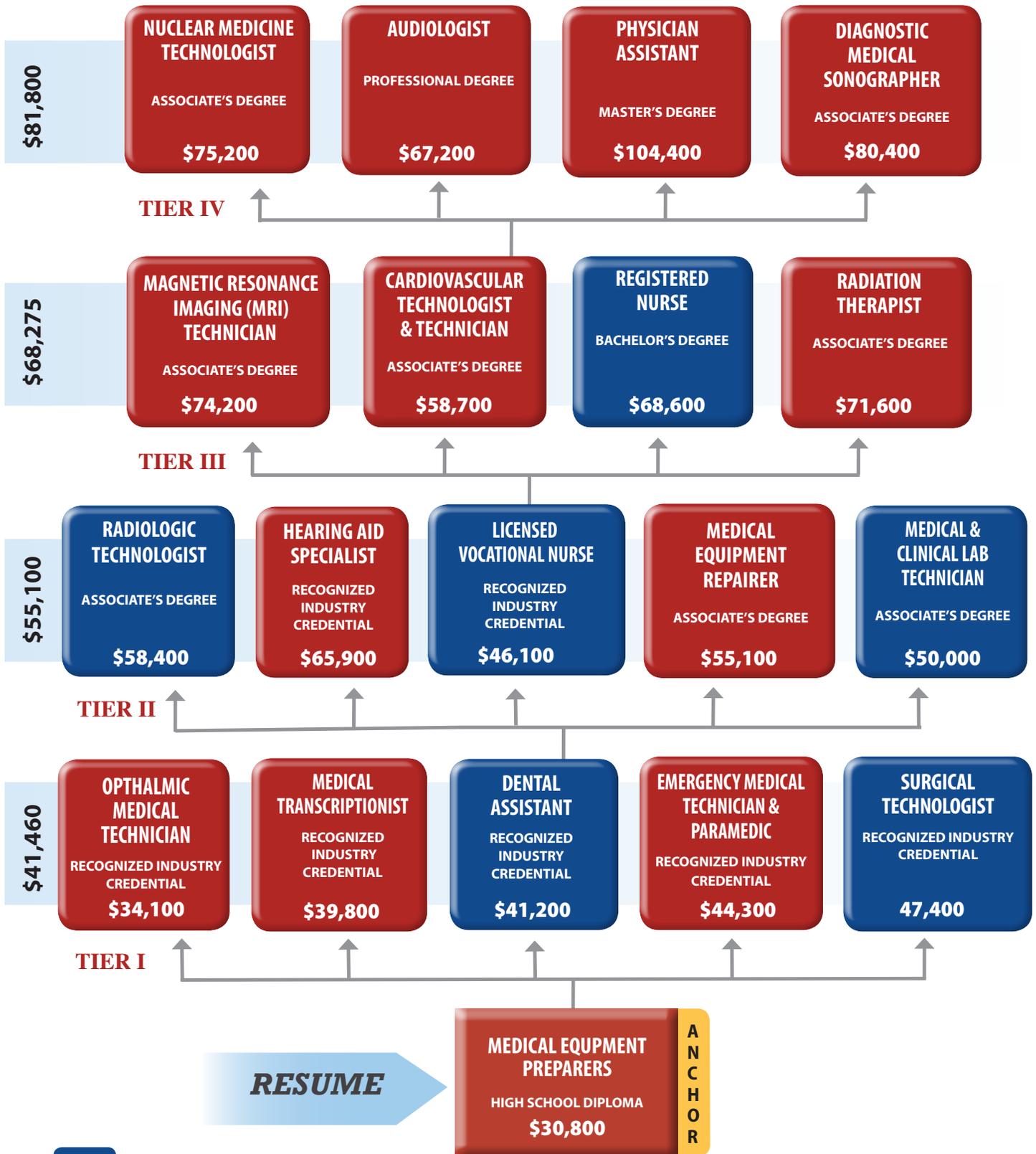
Note: blue boxes indicate Rural Capital Area Target Occupation

MEDICAL ASSISTANT



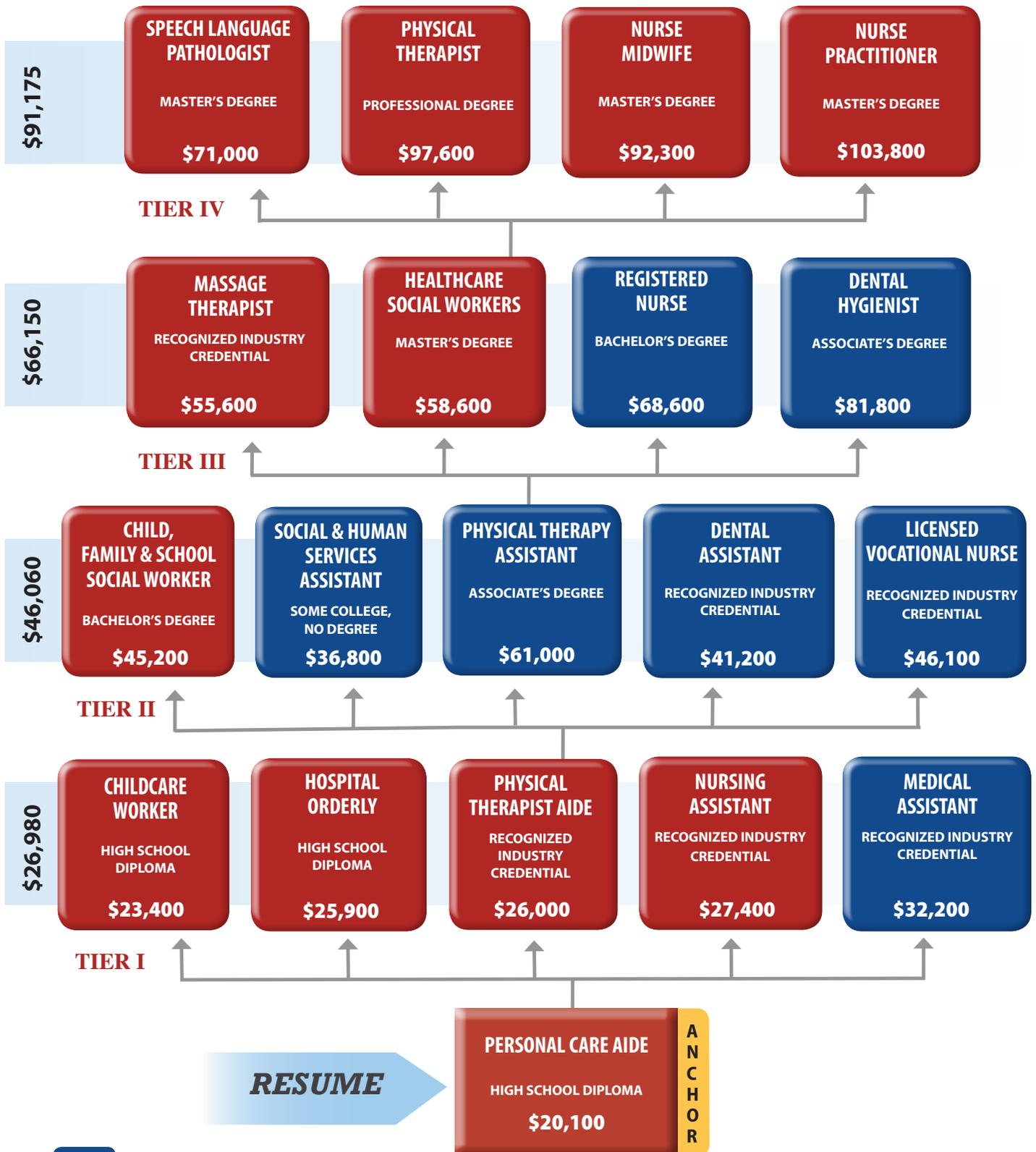
Note: blue boxes indicate Rural Capital Area Target Occupation

MEDICAL EQUIPMENT PREPARERS



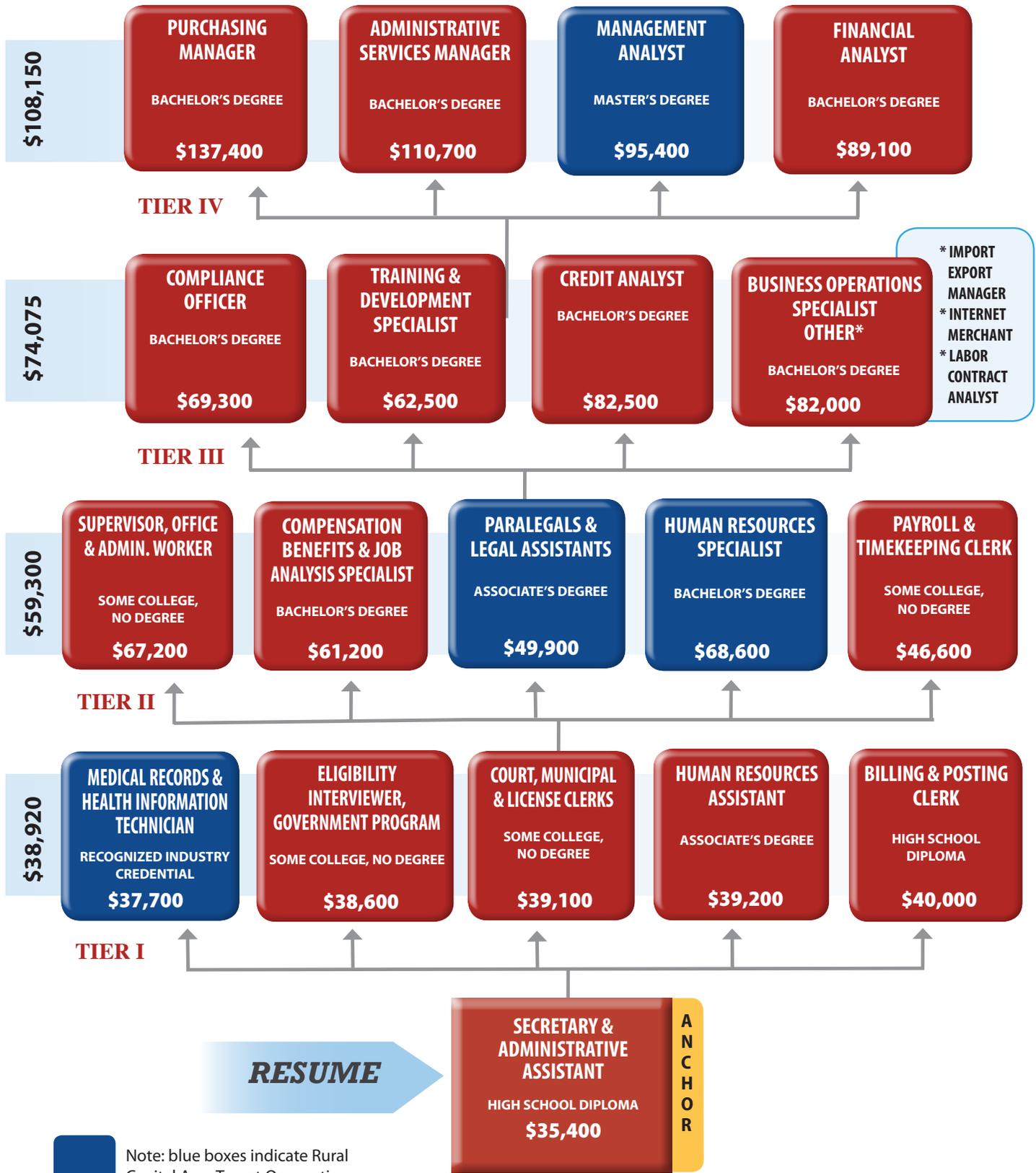
Note: blue boxes indicate Rural Capital Area Target Occupation

PERSONAL CARE AIDE

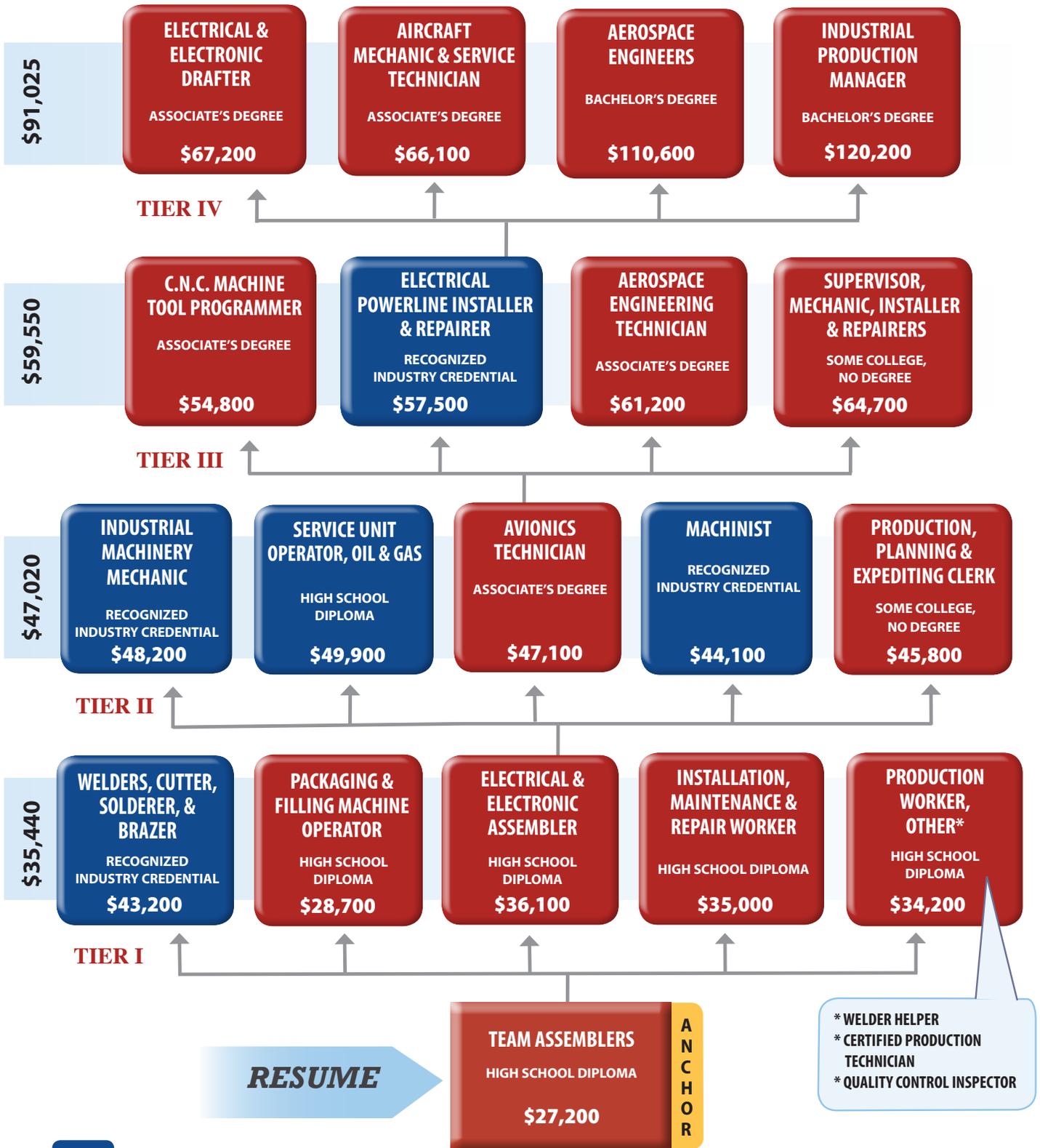


Note: blue boxes indicate Rural Capital Area Target Occupation

SECRETARY & ADMINISTRATIVE ASSISTANT

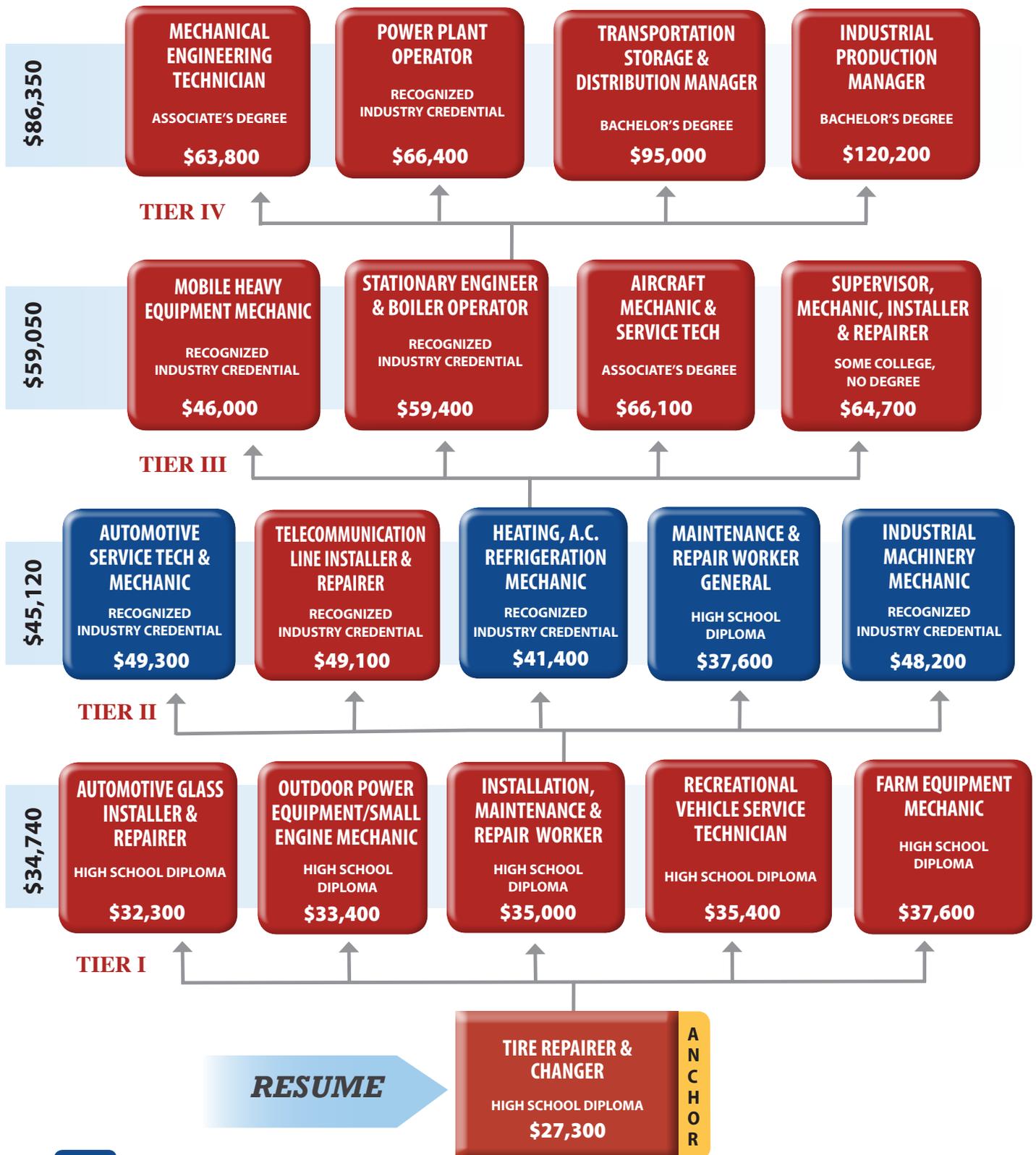


TEAM ASSEMBLERS



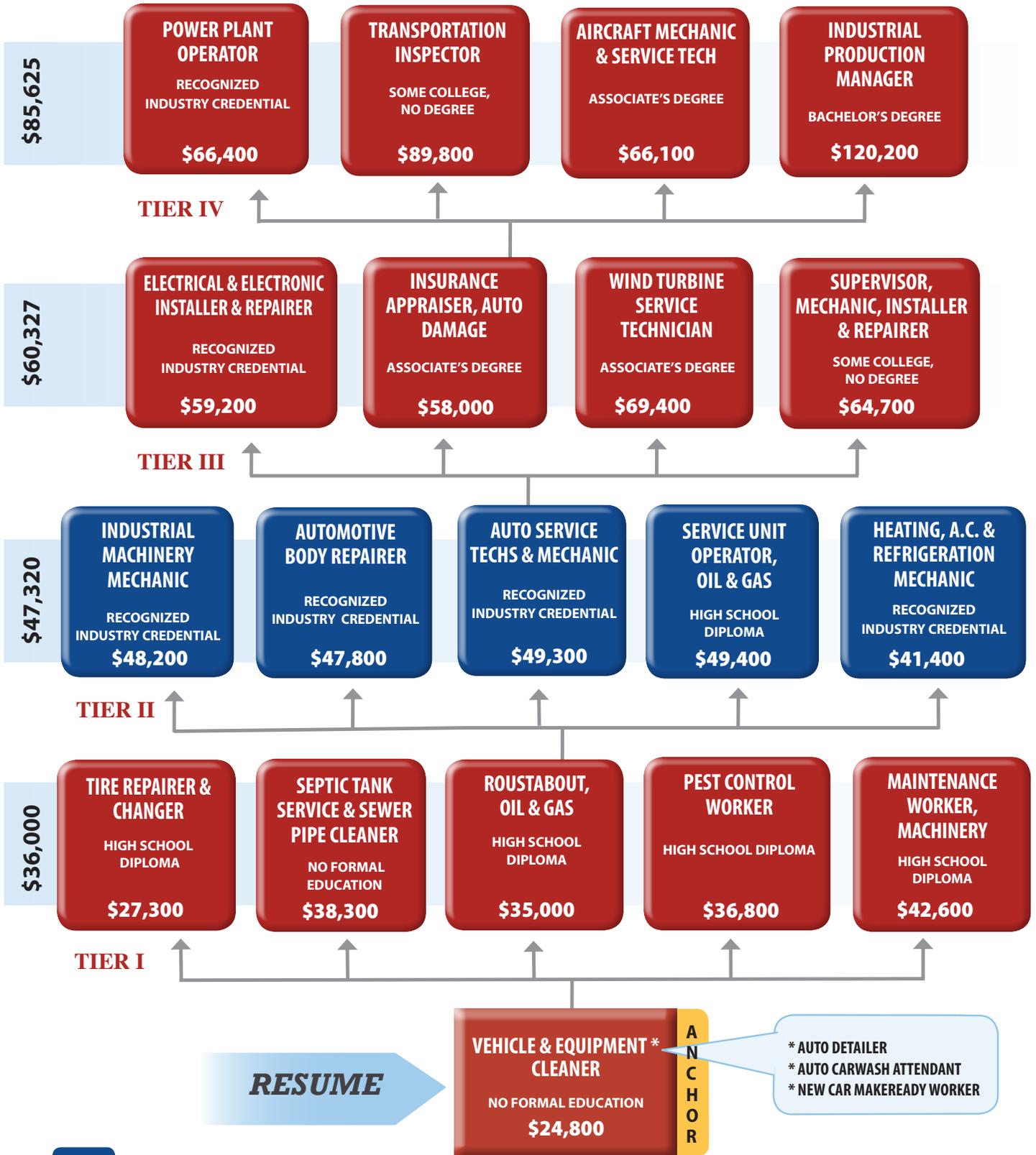
Note: blue boxes indicate Rural Capital Area Target Occupation

TIRE REPAIRER & CHANGER



Note: blue boxes indicate Rural Capital Area Target Occupation

VEHICLE & EQUIPMENT CLEANERS



Note: blue boxes indicate Rural Capital Area Target Occupation

From the Employer Perspective

Interviews with Rural Capital Area Regional Employers

H-E-B growing in Central Texas amid labor shortage

Keith Mendeke, regional director of customer service for H-E-B Grocery Company, interviewed July 11, 2019

“We don’t have the volume of job applicants that we once did in the Austin region and that worries us,” said Keith Mendeke, regional director of customer service for H-E-B Grocery Company. “That’s a factor of the low unemployment rate around here, but also the stress of the retail business; retail working hours today are 6 a.m. to midnight.”

Grocery giant H-E-B is already one of the largest employers in Central Texas, as well as statewide, and executives with the San Antonio-based company do not want worker shortages to hinder the company’s expansion northward.

To try to keep turnover low, H-E-B will continue implementing broad-ranging efforts to recruit workers while also promoting and supporting its renowned corporate culture.

“The culture of H-E-B is amazing. It’s almost like a cult: once you’re in, it’s hard to break free,” Mendeke said. “If somebody leaves H-E-B and goes to work for another retail company, they’re just disappointed with the culture where they don’t care about you as much or interact with you as much. This is a company with a family atmosphere with 100,000 employees.”

H-E-B employees get discounts on groceries, and Chairman Charles Butt continues to show up at stores to personally hand out \$100 bills to employees that he observes smiling at customers or working quickly.

Aside from relying on a positive corporate culture, H-E-B store managers and supervisors are frequently going to local job fairs – usually bearing free cookies and bakery goods – at Workforce Solutions offices and high schools.

“Every H-E-B manager also gives out his business card to anybody they come across in the community giving friendly customer service. They’ll whip out that business card and tell them that they can be part of the H-E-B family,” Mendeke said. “We recruit a lot; the tentacles are everywhere looking for people.”

Wages at H-E-B have crept up, particularly for the positions the company is constantly having to fill, such as overnight stocker.

In the Austin region the overnight stocker position now starts at \$15 an hour. Overnight stockers typically work 10 p.m. to 7 a.m.

“It’s hard to fill because it’s hard work, even for retail. You’ve got to be tough to do that job,” Mendeke said. “They’re the engine that runs the store. If you don’t have product on the shelves, you can’t operate as a business. They’re a unique breed. But if you find a good one, he’s worth his weight in gold.”

The grocery industry is also constantly changing. H-E-B is feeling competitive pressure from Amazon and its Whole Foods subsidiary. Along with that growing competition is the store’s popular new offering of “curb side delivery” and even “home delivery,” all of which results in additional tasks for the store employees.

Cashiers are another job that is constantly in demand. Cashiers now start at \$12.75 an hour but can start higher based on previous work experience.

In recent years, H-E-B has staffed up its corporate recruiting staff, which posts job openings and advertisements for workers. Job seekers must fill out job applications via the company's website and must state in that application if they are interested in working at a particular store or willing to go to a store or distribution center with the greatest need for workers in the applicant's region. The corporate recruiting staff filters the job applications, then often has a job seeker answer additional questions about their work history and work ethic in an on-line questionnaire or even a recorded video presentation.

The best candidates have their job applications sent to the store management team, which usually brings in the candidates for two rounds of face-to-face interviews with supervisors in the store.

"At the stores we value purpose over task," said Mendeke, a 15-year management veteran of H-E-B. "If I've got somebody who has little experience but tells me about how they like to serve and interact with others, I'm going to pick them over somebody with a decade of experience doing a task but doesn't seem to be as enthused."

Enthusiasm when interacting with others is important for the part of the grocery industry where most of the store workers are encountering customers. However, for H-E-B distribution centers, like the one in San Marcos, it's a different story. Distribution center managers aren't looking for a sparkling personality as much as they seek examples of persistence.

Job applicants for stores or distribution centers who get and accept a job offer are then given an assignment to do at home: fill out all of their human resources paperwork on a computer, print out the forms and bring that completed paperwork in on Day One.

"If somebody doesn't have their paperwork, that's a big red flag," Mendeke said.

He said the top "skills" H-E-B is looking for in workers include:

1. Creative Problem Solving

"You've got to be able to solve problems quickly. It's often not a black or white decision. You have to balance the needs of the customer with the needs of the store. If you have an upset customer and you spend \$50 to keep them, then I don't have a problem with that; but if you spend \$500 to make them happy, I will have a problem with that."

2. Literacy

New employees use Visual Training Aides that have pictures to teach them what to do and where items are located. But under those pictures are words describing work situations and other key information. Workers who struggle with reading and reading comprehension end up struggling in the job and create problems. "I believe we have a functional literacy problem in the United States, and it impacts business."

3. Attendance and being on time

"I see people across all generations who are always on their phone or acting entitled or who can't get to a meeting on time. It's a problem for everybody in the young generation, [and] it's a problem with some people across all generations."

In Central Texas, H-E-B stores range from 150 to 500 employees, with a typical store needing 250 workers. Finding, training and keeping a workforce requires constant work, he said.

Above all, H-E-B hiring managers need workers with a positive attitude.

"If you look at this company, you see people who are happy. You realize why H-E-B has a reputation for being a place where people like to work," Mendeke said. "At H-E-B, if you have a true servant's heart they'll find a place for you."

Giant Horseshoe Bay Resort having to get creative to meet growing need for workers

Interview with Mike McKeown,

Human Resources Director at Horseshoe Bay Resort, July 10, 2019

“Our recruiting strategy is to use a big net. No one source is going to get us the workers we need,” said Mike McKeown, Human Resources Director at the Horseshoe Bay Resort, which straddles Burnet and Llano counties.

The 7-person human resources staff at Horseshoe Bay Resort often posts jobs on WorkInTexas.com and LinkedIn.com websites, as well as working with local temporary staffing firms and the Workforce Solutions offices. But those efforts are not bringing in enough job seekers. So the resort has resorted to holding its own hiring events on site.

“We invited everybody and their dog to come to our property to apply for jobs,” McKeown said.

A recent on-site hiring event attracted 62 job seekers who were interviewed on the spot for positions ranging from housekeepers to bartenders to cooks to managers. From that pool, 40 people were given job offers and 38 accepted the jobs – and 8 of those new hires washed out in the first 30 days. McKeown said he was pleased with the results of the job fair and will be repeating that process later this summer to fill another 30 positions to replace the summer seasonal help who will be leaving. While having its own on-site hiring events is time consuming, it now seems to be a necessity, he noted.

To attract and keep employees, the resort has been increasing pay rates, particularly in the past three years.

“We’ve had to raise wages two times a year in recent years for difficult to fill positions. And now we’re not getting enough job applicants to fill our open jobs,” he said. “You would not believe how much time we’re spending on recruiting.”

The top occupations McKeown and his staff hire for are:

1. Housekeepers – now with a starting wage of \$13 an hour
2. Dishwashers – now with a starting wage of \$11 an hour

Geography is also challenge.

“The labor pool is pretty shallow out here. There’s not a lot of people who live in our counties and we’re not easy to get to,” McKeown said.

The resort has approached the teachers and counselors at Central Texas College and nearby high schools to let them know about jobs, training, and pay in order to pass that information on to their students. In addition, the resort’s human resources team has developed new training material and procedures to try to get new workers up to speed faster in their first 90 days to help identify the employees who can last.

Horseshoe Bay Resort, located 55 miles northwest of Austin, was founded in 1971 and has grown over the years. The resort now covers more than 7,000 acres and has 850 employees working at multiple restaurants, hotel and recreation operations.

“You would not believe how much time we’re spending on recruiting.”

“We’re constantly adjusting training to the labor market,” McKeown said. “Training is constant. We’ve developed checklists for everything and every job. Our big opportunity now is supervisor training.”

The growing resort works to promote from within, which creates new positions to fill.

McKeown points out that “soft skills” are most important in looking for new employees. The skills most in demand include:

1) The ability to talk to co-workers and guests in a clear and friendly way.

“You’ve got to have good human interaction skills. It’s all about service in this industry.”

2) A good work ethic.

All employees are measured on attendance and being at work on time. Key positions have to meet metrics, such as housekeepers having to spotlessly clean a guest room in 30 minutes. Supervisors further evaluate employees during the first 90 days.

3) Conflict resolution skills.

“This is anecdotal, but everybody runs into conflict with a co-worker, boss, or guest as they’re trying to get work done. It depends on how they handle that conflict. Do they listen? I spend an inordinate amount of time giving and receiving feedback,” McKeown said.

4) Good listening skills.

“We find that a lot of people are good talkers but not good listeners.”

5) Empathy.

This is a key skill for responding to complaints, McKeown noted. Employees are trained to demonstrate empathy using a three-step method, which the resort’s human resources staff and supervisors stress multiple times in 30-minute blocks of training. The first step is listening then confirming the complaint or concern of the other person. Next, the employee should validate the concern to show empathy. Finally, the third step, is to apologize on behalf of the resort. That approach tends to bring the guest over to the side of the employee and leads to a resolution.

“Some people enter the workforce without good work habits or have not seen good work habits modeled. We try to work with those people, but it is a challenge,” he said.

In an effort to find more job applicants who are willing to start out in housekeeping or in the kitchen then work their way up, McKeown said he is starting to target non-traditional populations, such as deaf or autistic students in the region.

“We struggle with these staffing issues every day.”

Strong regional economy causes growing pains and stress for businesses in **Johnson City**

Interview with Debbie Burkhard, co-owner of Old Annex Office Solutions in Johnson City, interviewed July 11, 2019

Spend a Saturday in Johnson City and the need for workers is apparent.

On a recent Saturday, coming into town visitors saw the marquee sign on the Dairy Queen in Johnson City that, instead of advertising summer specials on sundaes and Blizzard treats, said: “Now hiring all shifts, pay up to \$12 an hour.”

In addition, shop keepers and restaurant owners can be heard telling customers that they need more workers while lamenting that they’re tired from having to work longer hours because they lack help.

In a recent month, officials with the National Park Service announced that budget constraints and low pay have meant the federal agency has been unable to hire new workers to replace workers who are exiting. These staffing shortages are resulting in parks not able to be safely managed and many national parks are facing being closed on some days.

Meanwhile, officials with the Texas Parks & Wildlife Department made similar warnings about the consequences of ongoing staffing shortages to the Texas legislature.

Those warnings concern the Johnson City business community. Johnson City is filled with and surrounded by federal and state parks.

“It’s stressful,” said Debbie Burkhard, co-owner of Old Annex Office Solutions, a commercial real estate firm in Johnson City. “It’s stressful for our business owners and our local government.”

Tourism is growing here. While other Hill Country communities like Marble Falls, Burnet and Fredericksburg had already established their winery industries, Johnson City is quickly catching up with them as new wineries open in recent years.

This is adding to the demand for workers, particularly retail and hospitality staff. Local companies are advertising for \$12- and \$15-an-hour positions but getting few takers. One reason: there is little urgency to work for a key group of potential workers.

“Our businesses depend on high school students as workers. But so many of our high school students don’t need to work; their families are doing fine, so there’s no need to get out into the workforce,” said Burkhard. “It’s more than a lack of bodies issue.”

Johnson City had been a community dominated by wealthy long-time ranch families. Then wealthy retirees started moving into town. Many of the working-age adults in Johnson City commute into nearby Williamson, Travis and Hays counties for their jobs.

Johnson City is a community located in the Hill Country west of Austin and north of San Antonio. Parking spaces along the city streets and at the hotels fill up on weekends with people driving in from elsewhere in Texas.

And the topic of staffing shortages is often discussed.

Blanco County is still dominated by ranches, the National Park Service’s Lyndon B. Johnson National Historical Park and LBJ’s birthplace park, as well as the Pedernales Electric Cooperative’s operations.

But hospitality and tourism are obviously expanding and those are the businesses hanging out the help wanted signs. The Johnson City Chamber of Commerce lists 12 wineries under construction in addition to those that have already opened. In addition, Johnson City now has eight art galleries.

Local business owners have help wanted signs looking for retail sales clerks, hotel clerks, event center staff, store clerks, food prep and serving staff, and wine tasting staff. Those owners are fighting over especially inexperienced workers who are unaccustomed to interacting with adult co-workers and customers and may also be unfamiliar with business and accounting software, Burkhard said.

“One thing that concerns me is management. Workers who stay for a year get promoted into management, but they have almost no business experience much less any management experience,” Burkhard said.

Training inexperienced workers in basic soft skills, money management and basic management is needed in Johnson City, but the city’s small businesses don’t have human resources staff to do that. Burkhard said some kind of training is necessary to retain and bolster the local labor force. She hopes that a new Workforce Solutions office, expected to open in 2020, can help address this need or can at least help bring in some training contractors.

“The kids need training for those retail jobs. They’re not ready to start on day one but we need to get them up to speed if our businesses are going to survive,” Burkhard said.

“Staffing needs in the private and public sector will be a continuing need in Blanco County,” she said.

Hoar Construction wants to bolster mindset that trades jobs are career builders

Interview with Jeff Light, Director of Division

Operations for Texas at Hoar Construction on July 18, 2019

Building up a workforce that can fill the growing number of construction jobs demanded by the booming Central Texas economy is becoming increasingly difficult, say many in the regional industry, particularly Jeff Light from Hoar Construction.

“We are facing a huge lack of skilled workers and general laborers in Texas. And not just us, it’s hurting the subcontractors also,” said Light, director of the Texas division of the commercial construction general contractor.

As a general contractor, Hoar Construction and its subcontractors have been experiencing worker shortages in a wide variety of positions ranging from rough carpenters, for which entry wages are \$17-\$19 an hour, all the way up to its construction project managers, whose starting pay range is \$60,000 to \$65,000 a year.

Hoar Construction is a national construction company that specializes in commercial, industrial, medical, government, multi-family and retail building.

To fill its own jobs, Hoar Construction uses corporate recruiters, college career fairs and online job boards like Indeed and Monster. Job candidates are then directed to the company's website.

"Everything with our hiring has to filter through our website," Light said. The company's website feeds into an applicant tracking system that collects information on job applicants needed to show that the company is an equal opportunity employer, which is required by many of its construction customers, including the federal government.

Light said his company's hiring managers also are looking for those with certain soft skills. Specifically, they need people who have a well-developed concept of dedication and tenacity.

"We're looking for people who show high character and strong work ethic," Light said. "Our industry is a fairly tough industry. It's construction. Our work isn't always done in the best conditions and we need people who can handle that and get to work on time no matter the weather. If we're starting work at 7 a.m. you need to be there before 7 a.m. so we can get started on time, that doesn't mean 7:15 a.m."

One aspect that he and other Hoar Construction managers often look for is people who worked while going to school.

"The people who choose to work when they don't have to tend to be the people who want to work and who work out the best," Light said. "I also look for something that shows desire. I'm looking to see if they will take advantage of the opportunities we can give them."

Job interviews are critical in the company's search for good employees.

"Verbal communication is really important in our industry, and verbal communication is a big challenge for people in the younger generation today. They don't seem to talk much," Light said.

"We measure communication skills based on outcomes. People who get things done and get things done with other people tend to be the ones who are clear and concise when talking with others," he added. "The people [for whom] things don't get done around them and say that the people around them didn't do what they were supposed to do tend to be the people who don't communicate clearly."

The company has bolstered its training process in recent years to increase communication with new employees. Supervisors check in with new employees in their first 30, 60 and 90 days to learn how the employee is fitting in and whether the employee is learning or struggling.

Additional training and telling potential future workers about the benefits of that training and the rewards of working in the construction field is also key for Hoar Construction and other commercial builders in Central Texas, he said.

That may mean having Central Texas construction companies bolster their own in-house training programs and possibly coming together to create joint training

As a general contractor, Hoar Construction hires certain workers directly. They also hire subcontractors, and those subcontractors hire workers, as well. While the workers being sought by Hoar Construction often are people with a Bachelor's degree in construction management, building science or civil engineering, its subcontractors are often looking for workers with construction work experience or with specific vocational certifications.

programs. “The people in this industry who have had the most success have created training programs; you can call them apprenticeship programs or something else,” Light said. “That would help a lot of us.”

He wants Hoar and other construction companies to do more to show young people what can be accomplished and the money to be made in the construction trades -- without a college degree. “We’ve got to reinforce the point that there is a livelihood that comes with the trades,” Light said.

“We’ve got to change the stereotypes of our industry. We’re up against the ‘everybody-has-to-go-to-college’ mindset. I want young people to know about the career opportunities in our field.”

Embassy Suites reaching out to more staffing firms, recruiting more workers with disabilities amid regional labor shortage

Interview with Elva Zdeb,
human resources director at Embassy Suites in San Marcos, on July 23, 2019.

Embassy Suites in San Marcos just brought in a fourth temporary staffing agency to help the convention center and hotel fill its need for workers. This is the latest move that Elva Zdeb, human resources director at Embassy Suites, has taken to deal with a shortage of available workers in Hays County.

“I’m just trying to outreach as much as possible to attract new workers,” she added.

The need for workers has increased as business has grown with more conferences and events coming to Embassy Suites. While the population of Hays County has been growing, the demand for new workers is outstripping supply of new workers.

In June 2019, the unemployment rate in Hays County dropped to 2.9%, according to the Texas Workforce Commission. The unemployment rate was 3.3% a year earlier.

Zdeb recently started working directly with ARCIL Inc., a non-profit operation that has living centers across Central Texas to help people with disabilities and their family members learn living and working skills, to recruit future workers. She said that she will continue to search for new ways to reach out to underused populations and help them get into jobs at the Embassy Suites.

“Community partnerships like our relationship with (the San Marcos Independent School District) are instrumental to problem solving and creating opportunity,” she said.

Her outreach efforts are the result of her involvement with the Crossroads training programs at nearby San Marcos High School. The Crossroads program helps expose high school students with disabilities, primarily autism, to employers.

“We’re trying to get full-time employees any way we can,” Zdeb said. “We’re using Facebook, other social media, job postings, lots of job fairs, and even putting flyers up around town. And we’re still having to use contract workers.”

As part of the convention center and hotel's participation, Crossroads students typically work there for about four hours a week, during which the students rotate working with very experienced and less experienced staff members on tasks like helping set up a room for a convention or preparing a breakfast. Staff are encouraged to talk with the students.

"The goal is not that they're getting some work done for us but that they're learning – and we're learning," she said. "It gives our staff experience at training others. Afterward, I'll ask our staff some questions: What did the student learn from you? What did you learn from the student?"

Staff members who can answer those questions are identified as candidates for promotion into supervisory jobs.

Zdeb has been working more at local high schools by attending career days and bringing in students to shadow workers to get more accustomed to the idea of working and working at the hotel. "We want to show them how easy it is to work for an employer like us and show them that they can have a future with an employer like us," she explained.

At a recent job fair at San Marcos High School, the hotel hired three 18-year-olds – and two of those 18-year-olds showed up and started working. Extensive work experience is not necessary to come work for the hotel. "We are not looking for skill sets," Zdeb said. "That's why I'm reaching out to the high schools and telling them: 'Bring me your unskilled masses.'"

Embassy Suites currently has 150 employees and is typically using 50 temporary contract staff. The positions that are the most in need of being filled are room attendants (who start at \$10 an hour), restaurant servers (who just got a raise from \$4 an hour plus tips to \$7.25 an hour plus tips), and banquet set-up crew members (who start at \$11 an hour).

New employees get a half-day orientation before being eased into their first day at work. Then for a full day each month, the newer employees get additional training on guest safety, operations and the Hilton way of serving guests and running a hotel. That includes presentations and role playing on behavior and maintaining a friendly attitude that reflects the Hilton brand.

"Attitude is really important," Zdeb said. "You can complain but complain in a constructive way and help us get to a resolution to solve the problem."

Further outreach to underused populations like people with disabilities and helping them get into jobs is something Zdeb hopes to see more of. In the meantime, she will use whatever resources she can to help supplement the need for workers during extra busy days and for the bigger conferences.

"We're using multiple staffing firms because they're as stretched for workers as we are. No single firm can handle all of our worker needs and it's not getting better," she said.

"I'm interested in people who are warm, who can look you in the eye, and who haven't picked up negative attitudes from previous employers."

Extraco Banks need versatile modern bankers who can hustle

Interviews with Rene Flores on July 10, 2019, and Alex Eichenberg, on July 19, 2019.

“Banks are trying to do more and more with less and less employees,” said Rene Flores, Extraco’s vice president in Round Rock. “Banking has changed a lot in the last 20 years. In the past, you needed 14 or 15 employees to run a branch bank. Today you can run a branch with 3 or 4 employees.”

Extraco Banks is looking for friendly employees who can “float” and “hustle” in an open space. The bank’s lobbies don’t have standard teller counters where customers walk up and reach across a desk to interact with a teller. Extraco doesn’t even have tellers.

Instead, Extraco lobbies have kiosks with a small computer. So a “relationship banker” is expected to walk up to customers as they come in, talk to them about what they need, then walk them over to a kiosk to cash a check, issue a new debit card, or set up an auto loan.

“We expect more from our bankers,” said Alex Eichenberg, executive vice president of human resources for Extraco. Bank employees are expected to be flexible and able to respond to—or “float” among—various customers with varying needs.

“We really look for cognitive agility,” he explained. “We need people with the ability to adapt to the situation. I don’t know how you teach that, but that’s what we need.”

Extraco views itself as a model for modern banking, using fewer employees who are empowered to do more for a customer.

Extraco, headquartered in Waco, has 16 banks in Central Texas along with additional loan centers. The key job position the bank has to fill is that of “relationship banker,” which is the bank jobs of teller, customer service specialist and loan officer all wrapped into one job. While most bank tellers in Central Texas earn starting salaries of about \$27,000 a year on average, the annual salaries of Extraco relationship bankers start at \$38,000 to \$42,000.

A little more than half of the company’s relationship bankers have a Bachelor’s degree. Yet a degree is not the key criteria the bank is looking for when hiring; an applicant’s attitude is. Some of the bank’s best employees were former restaurant managers, who were experienced at being on their feet and talking through an issue quickly.

To get new relationship employees, Extraco uses online job board Indeed, as well as attends job fairs. But the bank has cut back on some of those types of recruiting efforts to focus more on offering a “bounty” to bank employees who refer a friend to apply for a job.

The bounty is now up to \$1,500. Half of that is paid to the employee when their referral joins the bank and the other half is paid if their referral lasts at least 90 days as an employee. That’s one of the biggest employee referral bounties in the region.

“We decided to double down on our best recruiting effort and it’s working,” Eichenberg said. “Our employees already understand the company culture and the industry, so they’re finding people who would be a good fit.”

Extraco currently has about 300 employees in Texas, including Eichenberg's 6-person human resources department.

All job applicants are sent to the company's website to apply for a job, then do an online video-taped presentation about themselves. The human resources team reviews applicants and selects the best for in-person interviews, which start with a supervisor, direct co-worker, and indirect co-worker.

In addition to relationship bankers, Extraco also recruits people for a commercial loan officer position, which handles large deposits and business loans. "With that job the personality is important, but we need a more advanced set of analytics skills as well," Eichenberg said.

Extraco has also expanded its training program. New employees go through a 5-week orientation and initial training. Then they have another 4 weeks of on-the-job training. That training includes working with computers and different banking software, as well as stressing the importance of interacting with a customer eye-to-eye.

"There's a real emphasis on personal interaction here," Eichenberg said. "That can be tough for people whose communication is mainly through texting on their phones. The ability to disconnect and focus at work is important. If our employee is looking at their phone, they're not looking at the customer walking in the door."

Caldwell County industrial park operator shares thoughts about future worker pipeline

Interview with Alfonso Sifuentes, Director of Market Development and Community Relations, for Green Group Holdings in Lockhart, Texas on Aug. 9, 2019.

Alfonso Sifuentes is thinking about the workers he is going to need in about a year. The unemployment rate in Caldwell County in May 2019 was an incredibly low 2.8 percent, making recruiting and retaining workers challenging even for employers like Sifuentes, who remains optimistic about finding workers for his company's new project.

Sifuentes is Director of Market Development and Community Relations for Green Group Corp.'s new 130 Environmental Park, a new mixed-use development in Caldwell County about four miles north of Lockhart. The proposed development, which includes a recycling, processing and disposal facility as well as an industrial park, has its required permits from the Texas Commission on Environmental Quality. However, 130 Environmental Park must first complete the current litigation process before an expected opening in 2020-2021. Sifuentes' goal is to eventually hire about 18-20 employees to manage the facility.

"Even with a labor shortage, you can always find people willing to work. While there are people with able bodies who are willing to learn, I'm optimistic about finding the

"This labor shortage doesn't cause me grave concern," Sifuentes said. "I've been through tough hiring times before and I know you just have to get creative. It's about being patient and focused on finding people who are willing to learn this industry and the job it entails."

workers we need,” he said. “The onus is on us as employers to think outside the norms to seek and find those potential employees.”

While he wants workers with experience in the solid waste industry, he acknowledges that such experienced workers may be hard to find in Caldwell County. Solid waste management is not always high on the list of career destinations for many.

“A rising population creates a lot of trash,” he said. “Disposal facilities are public infrastructure and a necessity.”

Those initial jobs will include entry-level positions like landfill laborers and spotters. These positions won’t require much experience or skills and will involve keeping the site clean of loose trash, inspecting garbage trucks to ensure that no hazardous waste is coming in, and directing truck traffic.

Additional workers will be needed for mid-level positions that involve heavy equipment such as compactor operators and other machinery. These type of positions will most likely require employees to have certifications and training specific to the types of equipment they will operate.

Other positions such as scale house operators will require some familiarity with heavy equipment and knowledge of computers. The use of electronic scales and other monitoring devices will require workers with cognitive, math and problem-solving skills.

Green Group plans to primarily use job fairs to recruit workers. This is an effective way to talk directly to potential employees and answer any questions about the jobs in this unique field. Then on-the-job training will be used as an instruction method for most of the positions as well.

“Bottom line: we need people who are trainable,” he said.

Additionally, 130 Environmental Park will need to have a licensed Municipal Solid Waste operator on site at all times during business hours. The Texas Commission on Environmental Quality, which provides the licensing, has strict requirements that involve a combination of college education and specialized training.

The 130 Environmental Park will sit on a 1,229-acre site with a permit boundary of 520 acres and a landfill footprint of only 202 acres. Due to adjacent floodplains and wetlands on the property, approximately 500 acres will not be disturbed. This will create additional buffers to those set by TCEQ regulations. In addition, Green Group eventually plans to develop 100 acres of the site for an industrial park. Green Group plans to target manufacturing and other industries that benefit by being situated near disposal sites. The park has the potential to become a major job creator for Caldwell County and the region.

To help create a pipeline of future workers, Sifuentes thinks the key is communicating to teenagers now before they drift away.

“The key is to catch these kids in junior high and high school and inspire them about making good career choices,” he said. “It’s about helping them understand that it’s not where you start, but where you desire to end up in your career that should be the focus. You can catch them in school, but once they’re out it’s tough to reel them back in.”

“If (employers) have an open mind and are willing to get out of our comfort zone, we could really make an impact in this labor shortage.”

Amazon has room to grow in Hays County

Based on site tour and interview with Eli Pabon, general manager at Amazon's San Marcos fulfillment center on Aug. 5, 2019.

Amazon's fulfillment center on East McCarty Lane near the San Marcos Premium Outlets opened in August 2016 and has been growing since. The fulfillment center employs about 1,500 full-time associates. Around the Christmas holiday season, the center employs hundreds more.

The building is approximately 855,000 square feet – about the size of 15 football fields – has four floors, miles of conveyor belts weaving throughout the building and holds tens of millions of products. The fulfillment center has an open and collaborative work environment. Large video monitors mounted near the entrance share information and recognize associates with messages that list top performing associates, current efficiency goals and an organizational chart listing human resources team members.

To further engage employees, the fulfillment center dedicates conference room space for its *Career Choice* program and associate training. Amazon's *Career Choice* program is one way the company attracts and retains associates while contributing to the community. The program pays 95 percent of the cost of tuition for continuing education courses in in-demand fields, regardless of whether the skills are relevant to a career at Amazon.

"Our *Career Choice* program helps a lot of associates who may have a barrier to getting their career moving, even if it's not a role that directly relates to their role at Amazon, we're helping contribute to the talent pipeline in the community," Pabon said.

About 130 associates at the San Marcos fulfillment center have taken advantage of the Career Choice program to further their education related to in-demand jobs in a variety of industries. Commercial driver's license classes are the most popular and other associates are taking classes to become dental assistants or legal assistants.

"I don't think we're feeling a worker shortage," said Eli Pabon, general manager of the San Marcos fulfillment center. "That could be because of our \$15 an hour minimum wage. Or it could be because of the work of our recruiting team."

It could also be because Amazon is a global brand that attracts job applicants. In addition to a highly competitive full-time hourly wage – ranging from \$15 to \$18.50 – and having a recognizable brand, Amazon provides comprehensive benefits starting on day one that include healthcare, life and disability insurance, 401(k) retirement accounts with a 50 percent employer match.

Additionally, Amazon is committed to focusing recruitment efforts on veterans and military spouses, pledging to hire 25,000 veterans and military spouses by 2021. "The structure of the company and the fulfillment center is often familiar to veterans," said Pabon, with his banner from the U.S. Naval Academy near his desk.

Amazon's regional and corporate recruiting team uses social media along with radio and billboard advertisements to publicize job openings. Job openings can be seen on Indeed and other online job boards, as well as on Amazon's career website – amazon.com/delivers-jobs. Amazon recruiters also attend job fairs in Central Texas, primarily at local colleges and Workforce Solution centers.

Area manager is another key role recruiters seek to fill at the fulfillment center. That is an entry level supervisory job that starts at approximately \$50,000 a year and external applicants need a Bachelor's degree to apply. Amazon also encourages interested employees who have worked at the company for at least two years to apply for this job and they are not required to have a Bachelor's degree.

Associates in the San Marcos fulfillment center are in a work environment that requires some physical activity, so they dress comfortably, most wearing shorts and sneakers. A sense of connectedness can be seen as some associates wear t-shirts from various company activities in which they've participated, such as volunteer events and associate affinity groups.

The most common positions needed at the San Marcos center are warehouse associate and area manager. "The warehouse associate role is an entry-level warehouse job, but with an incredible upside and opportunities," Pabon said. "You don't have to have experience working in logistics or a warehouse. But we do need basic skills: being reliable, having the ability to meet the job's physical requirements and following safety procedures."

Typical shifts are 10 hours a day for four days. There is also a special shift where workers work Thursday, Friday and Saturday nights for 12 hours at a time. "The best associates have good attendance, are internally motivated, and have a hunger and desire to move up," Pabon said.

"The local pipeline of workers hasn't been too bad," Pabon said. "However, I am interested in learning more about what is being done to attract and retain residents in Hays County."

In 2018, Amazon posted total sales of more than \$230 billion and that doesn't include revenue from all of the additional companies it owns. The company has more than 175 fulfillment centers worldwide, with San Marcos being one of more than 50 fulfillment centers featuring Amazon Robotics technology, where employees pick, pack and ship smaller items ranging from toys and baby products to books and small electronics.

In the San Marcos Amazon fulfillment center, robotic drive units that look like giant Roomba robot vacuum cleaners move across the floor in designated areas to lift shelf pods stocked with inventory and bring them to associates. The robotic drive units read barcodes on the floor and receive radio frequency instructions that tell them which shelf pod to bring to which employee. As a result, this assisted and collaborative technology is extending human reach and capability in Amazon's fulfillment centers in a manner that will make mundane, tedious and arduous tasks easier and more efficient, allowing skilled associates to re-allocate their abilities to more sophisticated tasks where they can add the most value.

Amazon's pride in its state-of-the-art technology and amazing associates became more evident earlier this year when the fulfillment center opened its doors to host daily public tours – twice a day, five days a week. The tours allow customers to see for themselves the magic that happens after they click "buy". Those interested in touring the fulfillment center can register for a tour at amazonfctours.com.

Contract manufacturer needs focused yet flexible workers

From interview with Frank Leonardis, vice president and co-owner of Ember Industries, on Aug. 22.

Getting workers who understand contemporary manufacturing processes while also being flexible enough to work for a mid-sized firm where the work can change every day is a challenge for Frank Leonardis. So he brings in help.

“I exclusively hire through a staffing company,” said Leonardis, vice president and co-owner of Ember Industries in San Marcos. “We have never chosen to take on the human resources functions of recruiting, background screening, drug testing and reference checking. That’s not what we’re designed to do.”

Ember Industries focuses on its work as a manufacturer of custom electronics, which ranges from circuit boards to electrical cable assemblies to electromechanical assemblies. That means for most of the company’s approximately 70 employees they have to learn the specifications to make many products for different customers. With small to medium size batches and different customers that could mean an employee might work on 15 to 20 different products in a month.

“We’re a custom manufacturer. We’re not making the same few products every day. We manufacture hundreds of products for dozens of customers and work changes day to day,” he said. “Flexibility is a huge factor in our industry.”

Like many mid-sized companies that serve a niche role in a larger industry, getting potential workers to understand what the firm does and has to offer is an initial challenge.

“For many people when they think of ‘manufacturing’ they think of old and dirty steel mills in Pittsburgh in the 1970s. But I’ve got an air conditioned and heated manufacturing floor that’s well-lit where many people sit down as they do their job,” Leonardis said. “People come in and see our operations and say: ‘Hey, this is cool. I never knew this existed.’”

At Ember Industries, the core position Leonardis and his managers need to fill is production assembler. Ember Industries ideally wants workers with electronics manufacturing experience but those are rare in Hays County. Instead he wants people who have some experience working in a manufacturing setting and be trainable.

Production assemblers at Ember Industries start at a competitive wage for manufacturing jobs in the area and generally become proficient in their job within three to six months by working with more experienced co-workers and attending on-site training.

“I need people who can learn and have the soft skills of critical thinking, attention to detail, flexibility, and good communication skills with others,” he said. “Being able to work amongst and with other people is important.”

Ember Industries has been using a local staffing company in San Marcos for 18 years. The staffing firm focuses on handling all recruiting, screening, testing and initial interviews for Ember Industries.

“About 95% of the people I hire have no specific hard skills I need so I know that I need to train them,” he said.

Leonardis knows he's not alone. "There are many other manufacturing companies in the region, but we all need different kinds of skills," Leonardis said.

Building up a regional pipeline of future workers with some core skills could come from broad-reach efforts to expose local high school students and adults to the employers in their community and the skills those employers value, he said.

Leonardis is interested in the new Certified Production Technician training program that Austin Community College has rolled out. That program exposes students to manufacturing production processes, concepts, tools, quality measurements, as well as safety and maintenance awareness.

"The ACC program is giving an overview of the basics of manufacturing. We could use a program like that in the high schools and for local adults to expose them to the employers and skills in modern manufacturing jobs right here."

Manufacturer **TASUS** working to build skilled workers

Based on interview with Tracy Jackson, senior human resources manager at TASUS Corp. in Georgetown, on Aug. 19.

In an effort to attract new workers and retain existing staff, TASUS Corp. in Georgetown has made some lucrative offers: Any employee who stays with the company at least one full year can have the company pay for their tuition toward a college degree and \$1,000 toward the closing costs of purchasing a home locally.

One young man recently took advantage of both promotions and just completed his degree with Texas State Technical College in Hutto and completed the purchase of his first house in Georgetown. "My whole goal is the help people grow their skills and integrate into the local community," said Tracy Jackson, senior human resources manager at TASUS. "I hope more people will take us up on these offers."

Jackson has been staffing the Georgetown plant since it started in 2005. TASUS makes plastic-injected components, primarily for automakers and particularly for Toyota. The TASUS plant is now running three shifts all day Monday through Friday, with additional shifts running most Saturdays.

The Georgetown plant now has 160 employees, eight have taken advantage of the paid tuition to get Associate's degrees in business, industrial maintenance, automation and supply chain management. The company has paid for employee classes at TSTC, Temple College and Austin Community College.

"The market's tough now. I'm looking for a plant manager right now and I've been looking for that person since February," Jackson said. "I've interviewed 60 people. And I'm working with two contract recruiters, who are frustrated."

"Our parts go into pickup trucks and sport utility vehicles. Those trucks are selling so we're busy," she said. "The economy's good but that also means it's tougher to find the kinds of people we need."

The frustration has come because TASUS wants its next plant manager to have a college degree, management experience in the plastic injection manufacturing field, plant management experience, community involvement experience, and the willingness to stick with the job for 10 years.

Finding a plant manager isn't the only job Jackson and her 3-person human resources team is trying to fill at the Georgetown plant.

The HR team spends a lot of their time trying to fill the key production operator job. In 2018, TASUS started new production operators at \$11 an hour. Then in early 2019 the company raised that wage to \$12 an hour. Now in September 2019 that starting pay is bumping up to \$12.50 an hour.

A production operator is working with the manufacturing equipment to make different parts. Production operators rotate their work every four hours to different machines and different inspection points while working in a cell of usually six workers. "So good communication skills and team building is important along with hand-eye coordination, manual dexterity and an eye for detail," Jackson said.

Other positions TASUS has to fill are maintenance technicians and automation technicians.

"These jobs are a lot harder to fill so we've teamed up with TSTC to help train our people. In these roles the technicians have to understand machines and voltage. We want them to have at least five years of plant maintenance experience but that's really hard to find in this market," she said. "We may find somebody with facilities maintenance experience, but we need automation maintenance experience."

Jackson is proud of hiring a young man who recently graduated from Georgetown High School, where he learned welding. She's hoping the young man can transfer those welding skills to plant maintenance and tooling as the company is looking at future retirements of Baby Boomer employees. "If something happens to our tooling manager in the next two years, like he decides to retire, then we're going to be in a world of hurt," she said.

TASUS has occasionally used job fairs and temporary staffing firms to recruit workers. Yet the company has relied on its human resources information system run by ADP to automatically send new job postings to Indeed and Simply Hired job board sites, which direct job candidates back to the TASUS web site to fill out job applications.

Jackson said she used Craig Henry and the Workforce Solutions office in Round Rock in the past to get good employees. Now she plans to follow up with Workforce Solutions as the plant is getting busier.

Hot Job Spotlight Cybersecurity Analyst

Cybersecurity Analysts labor supply and training is a concern for regional employers

Local technology company CyberDefenses just graduated its first class of trained cybersecurity analysts. With demand for cybersecurity services rising fast, the Round Rock-based company created its own apprenticeship program for new hires, who are now working with clients.

“We created this program because of the shortage of talent that is plaguing the entire cybersecurity industry,” said Keri LeBlanc, director of marketing at CyberDefenses.

The company’s Cybersecurity Apprentice program is a mix of classroom teaching, hands-on computer work, as well as mentoring. The mentoring aspect involves both shadowing senior executives in the company as well as working on client projects with those senior company leaders.

“We’re looking for somebody who has an interest and an aptitude in cybersecurity,” she said.

Job applicants were given tasks and assignments to determine how they approach solving complex problems, their ability to follow a process and their potential for grasping the intricacies of technology as well as observing and analyzing human behaviors. Finalists were brought in for in-person interviews and more tests to choose the first apprentice class.

Now those first apprentices have been disbursed throughout the company into more specialized roles working in the security operations center, advising clients on improving security and complying with regulations, or even working with state and local governments trying to protect their elections.

“Our cohort size has been limited by our budget and training bandwidth. This apprentice program is a way of helping us fill our positions,” LeBlanc said.

Pay is attracting people to the field. PayScale, the giant compensation consulting firm, reports that the average cybersecurity analyst in the United States now makes about \$76,000 a year. Meanwhile, CIO magazine recently estimated that the average ‘cybersecurity professional’ is earning \$116,000 a year on average across all experience levels. That’s more than \$55 an hour.

“It’s very much a specialized field and becoming more so. Many people come out of a Bachelor’s program without the skills or knowledge that can only be gained through experience, such as understanding how threat actors work in a particular industry or the nuances of certain technology platforms,” LeBlanc said. “We would like to see more collaboration between the local colleges and business to get more people ready to take on these jobs.”

CyberDefenses gets hundreds of job applications. But executives at the firm didn’t think that all the applicants had the right experience, training, nor even mindset for the jobs. So last year the company created its nine-month Cybersecurity Apprentice program.

CyberDefenses does not require that job applicants have college degrees but is looking for future employees who have a strong interest and the flexible mindset to adjust to a changing field. “Cybersecurity is relatively new and evolving. In other industries there are standards for how things work and how you do the job, but in cybersecurity things are changing so rapidly,” she said.

As organized criminals have realized they can use the Internet to take over a company’s computer system to collect ransom or steal customer information, more companies are being targeted. This creates greater demand for cybersecurity services.

CyberDefenses has 132 employees and is growing. About a third of the employees work in Williamson County and the rest are spread out across the nation, typically working near a client’s sites.

“In addition to monitoring network traffic and digital activity for anomalies that could indicate an attack, they’re scanning darknets on behalf of our clients. They’re looking for patterns, they’re looking for our client’s data, they’re looking for threats,” she said.

Nearby in Austin, Protis IT Solutions is also busy hiring cybersecurity analysts. Daniel Burton, chief technologist at Protis, works closely with the computer faculty at Texas State Technical College in Waco. Burton hires directly out of TSTC, which is in the process of creating a specialized Associate’s degree program in cybersecurity.

“The Number 1 skill we need is still soft skills, unfortunately. The ability to communicate clearly, both written and verbal, is so important because you’ve got to be able to communicate quickly and professionally with your co-workers and the client.”

Protis is an outsourced IT provider that focuses on companies in the health care and financial services fields with an emphasis on cybersecurity.

The second most important skill Burton is looking for is the fundamentals of computer networking, which includes working with routers, switches and transmission control internet protocols for allowing computers to communicate with each other and send packets of data. Beyond that his employees must understand firewalls and the Python computer language.

“Without those fundamentals of networking you can’t do anything in security,” Burton said.

TSTC students get to use popular equipment from Cisco and SonicWall. But Burton said it’s their internships with the information technology departments of local companies where they see and hear about data breaches and online cyber-attacks that drives their understanding. “That puts the roots of these ideas into their heads rather than traditional book education,” he said.

Still, Burton likes the model of a college providing foundational training then handing a student to an employer for fine tuning.

“I’m a firm believer that everybody needs to go to college. In my company I do require applicants to have a degree. It weeds out the pretenders. An Associate’s degree points

“People get into this industry because we have weird personality habits, but we all have to work with other people,” Burton said. “You have to have an almost mathematical brain wiring to succeed in this field. The personality setting of people who are more successful is the more analytical mindset.”

out somebody who has worked a bit harder and made an effort to get through a lot of relevant work,” Burton said.

In addition, Burton said that people interested in the cybersecurity field often need both help with their people skills as well as a broader understanding of the world – and that learning can come at a college campus.

“TSTC has students at all its campuses. I just wish they had more students at the Hutto campus because it’s easier to recruit people from within this metro area,” he said.

Both Burton and LeBlanc agree that demand for cybersecurity analysts is growing rapidly in Central Texas. Also, if Central Austin expects to keep its computer technology cluster reputation it will need more cybersecurity analysts.

“When it comes to getting trained employees,” LeBlanc said, “we need all the help we can get.”

Recommendations based on discussions with regional business

Commercial construction companies in the Houston region have an easier time hiring, recruiting and training new workers than their counterparts in the Austin region.

A couple decades ago, the human resources staffs of the eight largest commercial construction companies got together with some other national construction firms and educators to create standardized training curriculum for their workers. The result was the National Center for Construction Education and Research, is a not-for-profit education foundation founded in 1996.

Today almost all the high schools and community colleges follow that same construction curriculum.

Human resources leaders from those eight companies in the Houston area still argue about aspects of the NCCER curriculum. But everybody is essentially singing from the same song book. Those employers got together on industry training standards because they recognized they had a massive challenge of hiring workers. Workers understand that there is one certainty in their field: their construction project will end, and they will be laid off.

By having similar training and evaluation standards, those construction companies can hire each other’s workers as projects end. Workers learn that their skills are defined, understood and transferable.

Houston area workers who go through these training programs – either in high school, community college, union training center or even regional crafts training center – also learn that they can transfer those skills into other related fields, such as a construction laborer today who becomes a plumber in a few years while still staying in the same community.

Austin Community College and Texas State Technical College have made advances in defining skills and linking those skills to both certificate programs and inexpensive non-credit classes. Both ACC and TSTC have even gotten praise for their mobile training programs in which the colleges hold classes in municipal buildings, churches and even parking lots.

In talking to a dozen key employers, the core need for employers in the Rural Capital area is entry-level or secondary-level workers who do not need even an Associate's degree. Instead, employers are separately begging for the same thing: workers who have a little work experience and a little industry-specific training.

Two of the best providers of that training are in Central Texas. And other regional community colleges like Central Texas College, Blinn College and Alamo College have experience at bring short-term industry training to the communities of needy employers.

The Rural Capital Area Workforce Board may want to consider using one of its community college partners on a pilot project. For instance, the workforce board could subsidize a "Basics of Retail Management" class for a few weeks in a rural community. Or the workforce board could subsidize a "Basics of Logistics" or "Basics of Manufacturing" class in a community. These classes could go over standard math, standard terminology, standard quality measurements, and even role-playing scenarios for interacting with customers and bosses.

If the business community needs basic training to get workers in the door and up to speed, then the workforce board can deliver. The workforce board could coordinate some key training projects to begin building the workforce of the near future that is so necessary.

The workforce board may have to pick an industry, recruit hiring managers and human resources professionals from companies in that industry, then host those people in coming together with a community college to further customize the curriculum. But with historically low unemployment, these employers would welcome the attention and assistance in getting better trained and acclimated workers so their companies can get back to operating at capacity and not get bogged down during a strong economy.

Lastly, every employer mentioned the importance of some variation of workplace essential or 'soft' skills. The most oft repeated attribute was verbal communication or human interaction skills. Work ethic was repeated several times, as was attention to detail, reliability, and flexibility/willingness to learn. The importance of these largely personal attributes reinforces the need for some form of workplace essential skills training and a reinforcement of socio-economic learning skills such as conflict resolution.

Top 10 Most Repeated Workplace Essential Skills

1. Human interaction skills
2. Verbal communication skills
3. Trainable & willing to learn
4. Good work ethic
5. Attention to or eye for detail
6. Reliable & good attendance
7. Enthusiasm
8. Customer service orientation
9. Situational adaptability & flexibility
10. Conflict resolution

Career Progressions for Veterans:

A Skill-based Approach to Civilian Transition

There is nothing more sacred, more noble, than a soldier's commitment to the service of his or her country. The dedication and sacrifice made by this nation's military and their family members goes far beyond the trials faced by most working families. Therefore, when a service member is discharged from the military and faced with the challenge of moving to civilian life, they deserve a commensurate level of loyalty, obligation and support in securing a smooth and productive transition. No group is more committed to this challenge than the Texas workforce development system and the leadership of Workforce Solutions Rural Capital Area.

The civilian transition process is not always easy and getting a job is one of the cornerstones to a successful transition. As Col. Henry Perry, U.S. Army Garrison Commander of Ft. Hood says, just because a soldier leaves the service, the bills don't stop coming. All branches of service provide some form of transition program in which job search assistance, career assessment, and skills training are a part. In most cases, the goal of getting the service member employed after military service is viewed as the ultimate goal.

Fast forward to the American job market circa June 2019. The national unemployment rate is 3.6 percent, arguably below what is viewed as full employment for the country²⁷. The labor market is on the upswing; there are more jobs posted than unemployed persons, many posted job openings remain unfilled for long periods, and most folks who want a job can get a job. Surprisingly, the U.S. unemployment rate for veterans is even lower than for the nation as a whole. Coming in at 2.7 percent in May 2019 for all veterans 18 years and older, it is a full percentage point lower than the 3.7 percent rate in April 2018. This low rate is bolstered by even lower rates for prime age working veterans, a.k.a. Gulf War II era veteran workers coming in at 2.1 percent²⁸.

Based simply on the unemployment figures, veterans are finding work at rates even higher than the average civilian. But where are they working, and are they finding jobs that allow them to leverage the skills and training they acquired in the military? And, most importantly, are they taking jobs with the ability to achieve future upward career mobility? Given general economic conditions and the employment situation of veterans, it can be argued that the emphasis of veteran employment activities targeted at just getting a veteran a civilian job deserves a shift in focus. Namely, less emphasis on direct job placement and greater emphasis on occupational and wage mobility potential.

This emphasis includes helping transitioning service members not just get a first job but helping them visualize a career progression in which a commitment to life-long learning and skill acquisition can lead to higher paying, and more rewarding career opportunities. Clearly, veterans can get a job. The question is whether they have the resources to envision and build a long-term, upward career strategy.

²⁷The Texas statewide, seasonally adjusted unemployment rate was 3.5 percent.

²⁸ <https://www.bls.gov/news.release/empsit.t05.htm>

While career opportunities abound in a full-employment economy, most soldiers are accustomed to the military delineating available career ladders and setting requirements to reach each higher rung. In civilian life, workers are responsible for building their own career path. The trade-off between more rigid but better-defined career ladders in the military is replaced with greater opportunity and flexibility in civilian life - but with responsibility for upward career mobility falling on the worker.

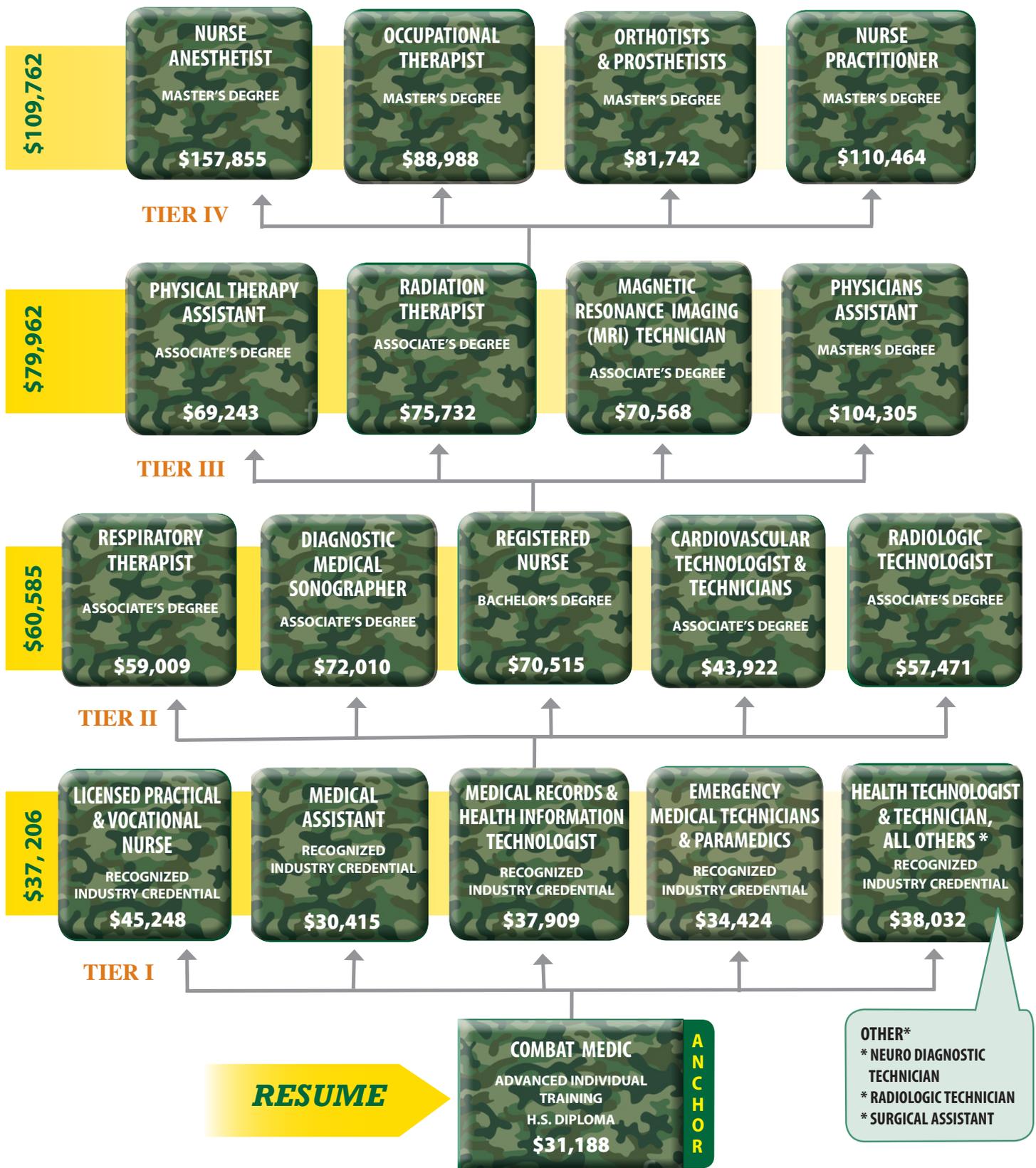
Most transitioning soldiers are directed to look at civilian occupational proxies that mirror duties performed during military service. These crosswalks between their military occupational expertise (MOS) and civilian occupations (SOC) work for military classifications in fields such as communications and health care that have clear civilian equivalents. They work less well for war fighting occupations. Plus, there is more than sufficient anecdotal evidence that many service members were assigned their occupational specialty by the military and may not view their military job as an appropriate point of departure to civilian employment.

It follows that a preferred approach to transition services is to help the service member create a skill profile that is unique to them. This approach is more directly related to achieving occupational and career mobility. Every transition has a point of entry; an entry-level job that pays the bills. But just like with graduating students, ideally a soldier can use an entry level job to not only better understand other labor market options, but as a stepping-stone to higher pay, and more rewarding jobs in which they can leverage their diverse skills.

Demonstrating how an entry-level job is the beginning of a career progression that shows options, prevailing wages, and likely educational mile markers to higher paying opportunities is an excellent starting place. Indeed, the military itself is an exemplar for showing well-defined, upward pathways through promotion - a concept with which all service members are infinitely familiar. However, the same highly regulated promotional paths with which they are familiar in the military are largely absent in civilian life. Moreover, in the civilian world it is up to the soldier to identify and build their own career track. In the civilian labor market, it is often neither staying in a specific industry or working within the same occupation that results in career growth, but rather how one leverages their unique skills, initiative, attitudes, behaviors, and training into higher paying positions. It is critical that transitioning veterans understand this cultural distinction.

The concept of a career progression is not new. We still refer to a steady upward career path as a 'career ladder' - implying that each career move is upward in pay and prestige. But in the 21st century the career ladder has been replaced by the career lattice. Under the lattice concept, careers often include sideways transitions. That can include changing occupations into something with more job opportunity, making a geographic change, or even stopping-out to deal with family or personal issues. It is likely that many veterans will find themselves on a career lattice in which not all moves are strictly upward. To be sure, everybody starts somewhere in the job market, including transitioning veterans. That journey rarely begins at the top of the economic pile.

COMBAT MEDIC



Under the career lattice concept, a transitioning service member can take their personalized skill profile, identify possible entry-level occupations that allow him/her to leverage their skills, and then understand the many upward career possibilities that are available from any entry level job.

In this scenario, not only does the veteran have a starting civilian job, but with some initiative and additional investments in education and training they are in a position to build a rewarding civilian career pathway. An example of a career progression lattice for Combat Medic (MOS 68W) is provided herein.

For this exercise, we took a very similar approach to the career progression lattices developed for the Rural Capital Area, but we used the entire state of Texas as the designated labor market region. A narrative job description for Combat Medic was developed and processed through an extensive skill statement data library developed and curated by SkillsEngine, an entity within Texas State Technical College. The skill profile for Combat Medic was then processed against similar skill profiles for over 820 occupations in the Texas economy.

The occupations with the highest, and most critical, skill match that typically require the least amount of additional formal education - and yet offer higher median earnings - were selected as the first tier of career options on the career progression lattice. Subsequent tiers of the lattice were similarly developed by building an enhanced skill profile based on occupational options from the lower tier. As each tier is added, the presumption is that additional skills - whether through formal or informal education and training credentials - have been added that increase the workers qualifications for increasingly higher paying jobs. It becomes obvious in the process that most upward wage movements require additional education or skills training. But within the lattice, these are shown and can become part of a soldier's long-term plan for career mobility.

Navigating the job market to optimize one's personal career growth is not easy for even the best educated and well-informed worker. There are workplace complexities in the global economy that cause uncertainty, even for the most strategic and well-managed American company. And while existing military transition programs provide considerable, valuable information, those programs can and should evolve as the labor market and economic conditions change.

There is no magic pill that if taken will relieve veterans of the same chaos and anxiety faced by all civilian workers. In fact, the 'climbing wall' theory of career development shows everybody hanging onto the wall by their fingers and toes. Some people are more comfortable or have made more progress climbing to higher levels, but everybody is hanging on. No career was ever built without initiative and hard work. Not every soldier has the same level of interest or ambition necessary to reach the top tiers of a career progression lattice. But these characteristics are hardly foreign to American service members. A veteran armed with a focused understanding of their own unique skill set, the ability to clearly communicate those skills to a civilian hiring authority, and an occupational roadmap to a rewarding career progression, will be better prepared for the challenges of the labor market and success in the civilian job market.

Developing a List of Target Occupations

for Workforce Solutions Rural Capital Area for Purposes of Career Progression Lattice Development

Note: This career progressions initiative fell at a time when the Rural Capital Area Workforce Board was in the process of re-visiting their Target Occupations list. This list plays a pivotal role in the career progressions methodology and thus a new, finalized Target Occupations list had to be developed before the project could begin. To assist Workforce Solutions staff in this process, the contracting team conducted some additional research and suggested new occupations that might be suitable for inclusion. The following narrative documents the rationale, methodologies and ultimate findings from that research.

²⁹ The process of reviewing scores of industry staffing patterns can be time consuming. Data analysis from the Bureau of Labor Statistics applying the Herfindahl-Hirschman construct to SOC occupations is especially useful for this purpose. See https://www.bls.gov/opub/ted/2014/ted_20140305.htm?view_full

Identifying regional labor market opportunities is an important role for a Local Workforce Development Board. The activity is required under the WIOA legislation and by the Texas Workforce Commission. Not only is the list of 'Targeted Occupations' used to focus eligible training investments, but it is often viewed as a focal point for regional education and training collaboration.

There are any number of methods that can be used to establish a list of high value occupational opportunities in a regional labor market. Ultimately, there are three unique categorizations associated with regional occupations likely to have high demand and above average job opportunities. These are 'hot' occupations, those with higher than average projected growth rates, 'ubiquitous' occupations, those commonly found across many different industries and regions, and 'critical' occupations, those that are essential to providing services in expanding industries. Each of these groupings, and how they are typically identified, are explored in greater detail below.

Hot occupations are those with above average projected job openings, growth prospects and online job postings. These are the occupations denoted in most high growth - high wage strategies. These are usually identified using an occupational filtering approach in which the analyst sets parameters across the various labor market indicators and winnows down the list to those that exceed the established thresholds.

Ubiquitous occupations are those that are found across multiple industries and geographies and thus are not necessarily tied to the economic fortunes of a single region or industry. The value of ubiquitous occupations is that those qualified can usually find jobs in their career field regardless of where they choose to live or which industries happen to be growing. Because they are most often linked to a specific set of skills, these occupations tend to have higher formal education requirements. These occupations are typically identified through a combination of occupational filtering and examining industry staffing patterns to find occupations commonly found in many different industries with above average demand.²⁹

Critical occupations are those that are essential to the operations of growth industries and without which those industries cannot function. Examples of critical occupations might Electricians or Plumbers in Specialty Trade Construction or Registered Nurses in Hospitals. This assessment takes all three drivers into consideration through different methodological approaches. To identify these occupations, one typically conducts an industrial targeting analysis to distinguish likely growth industries, and then uses industry staffing patterns to see which occupations are essential to each industry.

Revisiting Target Occupations for Rural Capital

Workforce Solutions Rural Capital Area already had an established list of 21 Target Occupations used for current operations. The list was developed using six primary criteria, including; 1) pays an average hourly wage of \$18.00 (\$37,440)³⁰, 2) does not require an Associate's or Bachelor's degree, 3) training can be completed in 12 months or less, 4) has a high number of annual openings, 5) has a low employment turnover rate, and 6) the number of regional training completers is not meeting the demand.

It should be noted that despite ostensibly filtering out occupations for which the Bureau of Labor Statistics (BLS) assigns a typical education level of Associate's degree or Bachelor's degree, there were three such occupations on the Rural Capital Area list. Moreover, if one applies a more precise education requirement standard designed to describe the level of education needed to compete for available jobs in an occupation, the list had six such occupations³¹.

There is nothing inherently wrong with these filters – or this list. In fact, the list includes occupations that all require some level of technical training and exhibit high regional demand and good wages. But the list poses certain challenges as a foundation for a career progressions lattice initiative. First, the decision not to include occupations that require an Associate's degree or Bachelor's degree means that most of the occupations are at best only Tier I occupations on a career lattice, i.e. only one step removed from the entry-level Anchor occupation. Thus, the list lacks any aspirational occupations that would be ideal for creating a career progression lattice.

Second, there are only 21 occupations on the list. This too is not typically problematic for workforce development purposes and, in fact, represents a high degree of prioritization that suggests a strong focus on regional job opportunities. However, for purposes of a career progression lattice initiative, there is latitude for more than the 21 Target Occupations that would generate more entry-level or 'Anchor' occupations from which to build the lattices and more aspirational options on the upper tiers.

³⁰ It should be noted that although the minimum wage threshold was set at \$18.00 per hour, a weighted median wage (based on job openings) for the list of 21 occupations was actually \$23.27 per hour or \$43,700 per year. This higher wage was heavily influenced by information technology occupations and Software Developer, Applications in particular.

³¹ The Competitive Education Requirement (CER) assignment from RCFroeschle Consulting combines occupational education markers from four different data sets to derive the most typical, competitive level of education required to compete for available jobs in each occupation.

Rural Capital Workforce Solutions Target Occupations List					
SOC	Occupation Title	Annual Openings	Avg. Hourly Wage	Competitive Education Requirement (CER)	BLS Entry Level Education
49-3023	Automotive Service Technicians and Mechanics	147	\$22.29	Recognized Industry Credential	Postsecondary nondegree award
43-3031	Bookkeeping, Accounting, and Auditing Clerks	472	\$18.48	Some College, No Degree	Some college, no degree
15-1151	Computer User Support Specialists	131	\$24.94	Associate's degree	Some college, no degree
31-9091	Dental Assistants	163	\$18.60	Recognized Industry Credential	Postsecondary nondegree award
49-9051	Electrical Power-Line Installers and Repairers	15	\$27.14	Recognized Industry Credential	High school diploma or equivalent
47-2111	Electricians	286	\$24.29	Recognized Industry Credential	High school diploma or equivalent
49-9021	Heating, A.C. & Refrigeration Mechanics/Installers	164	\$18.41	Recognized Industry Credential	Postsecondary nondegree award
53-3032	Heavy and Tractor-Trailer Truck Drivers	459	\$18.45	Recognized Industry Credential	Postsecondary nondegree award
49-9041	Industrial Machinery Mechanics	41	\$23.57	Recognized Industry Credential	High school diploma or equivalent
15-1122	Information Security Analysts	37	\$51.77	Bachelor's degree	Bachelor's degree
51-9061	Inspectors, Testers, Sorters, Samplers & Weighers	114	\$19.88	Associate's degree	High school diploma or equivalent
29-2061	Licensed Practical and Vocational Nurses	60	\$21.72	Recognized Industry Credential	Postsecondary nondegree award
51-4041	Machinists	53	\$19.99	Associate's degree	High school diploma or equivalent
49-9071	Maintenance and Repair Workers, General	401	\$17.72	High school diploma or equivalent	High school diploma or equivalent
31-9092	Medical Assistants	336	\$14.01	Recognized Industry Credential	Postsecondary nondegree award
29-2071	Medical Records and Health Information Technicians	10	\$19.11	Recognized Industry Credential	Postsecondary nondegree award
47-2152	Plumbers, Pipefitters, and Steamfitters	318	\$21.97	Recognized Industry Credential	High school diploma or equivalent
43-6014	Secretaries & Admin Assistants, Ex. Legal & Medical	519	\$16.57	High school diploma or equivalent	High school diploma or equivalent
15-1132	Software Developers, Applications	499	\$51.19	Bachelor's degree	Bachelor's degree
15-1134	Web Developers	45	\$37.42	Associate's degree	Associate's degree
51-4121	Welders, Cutters, Solderers, and Brazers	111	\$22.53	Recognized Industry Credential	High school diploma or equivalent

There are two additional considerations for revisiting the current Target Occupations list. Under the new WIOA legislation there is a push for greater coordination among education partners. While coordination can take many forms, one approach includes agreement on regional occupational demand priorities. This sentiment is embodied in the new Unified State Service Plan from the state of Texas. Over the past several years, the Tri-agency partnership including the Texas Workforce Commission, the Texas Education Agency, and the Higher Education Coordinating Board have been building toward improved articulation of education and workforce development activities.

One manifestation of this is the new Programs of Study (POS) initiative at TEA. Built around a strong desire to have high school Career and Technology Education (CTE) program offerings better aligned with regional labor market demand, TEA took the bold step of completely rebuilding the POS framework. Employing a theme of being data-driven and locally replicable, TEA's new POS primarily uses an occupational filtering approach to identify occupational 'tent poles' or significant high wage, high demand occupations around which a program of study can be designed. Because of their mantra of preparing students for "Career, College or the Military" (CCM) TEA includes in each POS grouping at least one occupation that represents a higher education 'exit point' e.g. occupations that competitively require a Bachelor's or Master' degree³². Each ISD will be responsible for a local needs assessment to develop their own POS offerings list around the demands of their regional labor market.

Designed into the TEA approach is the recognition of efforts to understand regional labor markets conducted by local workforce boards, as evidenced by their Target Occupations list. Thus, if an occupation appears on a Board Target Occupations list that coincides with their ISD geography it is automatically assumed to have regional demand and is sufficient justification to offer training. Although the new POS initiative will not go into effect until SY2020-2021, this collaboration puts added pressure on local workforce boards to include at least some occupations that typically require a higher education credential.

Historically, including occupations requiring a Bachelor's degree was viewed by the Texas Workforce Commission as out-of-scope for regional training investments. However, in the last round of Target Occupations analyses, collectively the Boards identified 1,067 Target Occupations for an average of about 38 occupations per Board. Roughly 39 percent of the entries on this cumulative list required a Bachelor's degree or higher. Further inquiry with TWC staff confirmed that there is no restriction on adding occupations typically requiring a Bachelor's degree. In fact, it was reiterated that Boards often use the Target Occupations list to develop more than their array of ETP training options. The list also serves to educate the public about the pipeline of workers needed in their region, and which certificates or academic degrees to promote or pursue.³³

It is in this total context that a fresh look and approach to identifying a Rural Capital Target Occupation list was undertaken. For purposes of this exercise, two approaches were employed: an occupational filtering approach and a labor market industry targeting approach.

³³ TWC leadership does not outwardly prohibit or discourage Boards from identifying Target Occupations that require a Bachelor's degree. Because ETP training is up to 2 years, Boards may fund the last couple of years of a Bachelor's degree program or fund teacher certification. It is thought however, that many Boards avoid that scenario since shorter term training resulting in high wage jobs is a quicker 'win' for the client and enhances Board performance.

³² Note that TEA excludes occupations that require a PhD or Professional degree and those competitively requiring a high school education only or no formal education credential from the "tent pole" or foundation list of occupations.

Hot Occupations: An Occupational Filtering Approach

'Hot Occupations' are those that have outsized job growth prospects. To determine this subset one can use an occupational filtering or occupational indicators approach. When TEA started their new Programs of Study initiative in 2018, they opted to primarily build their high wage/high demand occupation list around an occupational filtering methodology; bringing in a variety of complementary analyses as necessary³⁴.

Using the EMSI *Analyst* data platform for Texas labor market information, TEA selected occupational parameters of a projected 17.0% job growth rate (Texas statewide average for all occupations between 2017 and 2027), a minimum of 500 projected job openings, and

Occupation Snapshot in Rural Capital Career Progressions without Travis County (2019Q1)				
	SOC	Occupational Title	Competitive Education Requirement (CER)	Avg Ann Wages 2017
Occupations with wage above \$43,700, added 20 or more jobs 2016-19, PCT CHG above 29.5%, had ten or more online job postings, eliminated occupations requiring a PhD or professional degree, eliminated occupations that were Managerial in nature due to experience issue				
	00-0000	Total - All Occupations		\$43,700
1	13-2011	Accountants and Auditors	Bachelor's degree	\$67,400
2	49-3021	Automotive Body and Related Repairers	Recognized Industry Credential	\$45,000
3	17-2051	Civil Engineers	Bachelor's degree	\$83,000
4	27-2022	Coaches and Scouts	Bachelor's degree	\$44,400
5	15-1121	Computer Systems Analysts	Bachelor's degree	\$85,600
6	15-1151	Computer User Support Specialists	Associate's degree	\$47,000
7	13-1051	Cost Estimators	Bachelor's degree	\$68,700
8	15-1141	Database Administrators	Bachelor's degree	\$83,700
9	29-2021	Dental Hygienists	Associate's degree	\$76,600
10	11-9031	Education Administrators, Preschool and Childcare Center/Program	Bachelor's degree	\$44,000
11	17-2071	Electrical Engineers	Bachelor's degree	\$107,600
12	49-9051	Electrical Power-Line Installers and Repairers	Recognized Industry Credential	\$54,600
13	47-2111	Electricians	Recognized Industry Credential	\$47,500
14	13-2051	Financial Analysts	Bachelor's degree	\$82,300
15	27-1024	Graphic Designers	Bachelor's degree	\$52,300
16	13-1071	Human Resources Specialists	Bachelor's degree	\$62,400
17	17-2112	Industrial Engineers	Bachelor's degree	\$95,100
18	41-3021	Insurance Sales Agents	Some College, No Degree	\$57,300
19	29-2061	Licensed Practical and Licensed Vocational Nurses	Recognized Industry Credential	\$43,700
20	13-1111	Management Analysts	Bachelor's degree	\$88,600
21	13-1161	Market Research Analysts and Marketing Specialists	Bachelor's degree	\$76,800
22	31-9011	Massage Therapists	Recognized Industry Credential	\$51,700
23	29-2012	Medical and Clinical Laboratory Technicians	Associate's degree	\$46,200
24	29-2011	Medical and Clinical Laboratory Technologists	Bachelor's degree	\$46,300
25	13-1121	Meeting, Convention, and Event Planners	Bachelor's degree	\$54,400
26	15-2031	Operations Research Analysts	Bachelor's degree	\$70,900
27	23-2011	Paralegals and Legal Assistants	Associate's degree	\$45,100
28	31-2021	Physical Therapist Assistants	Associate's degree	\$57,100
29	47-2152	Plumbers, Pipefitters, and Steamfitters	Recognized Industry Credential	\$46,800
30	27-3031	Public Relations Specialists	Bachelor's degree	\$60,600
31	29-2034	Radiologic Technologists	Associate's degree	\$54,100
32	41-9022	Real Estate Sales Agents	Recognized Industry Credential	\$61,400
33	29-1141	Registered Nurses	Bachelor's degree	\$63,700
34	29-1126	Respiratory Therapists	Associate's degree	\$54,900
35	15-1132	Software Developers, Applications	Bachelor's degree	\$97,700
36	29-2055	Surgical Technologists	Recognized Industry Credential	\$44,100
37	13-1151	Training and Development Specialists	Bachelor's degree	\$57,600
38	15-1134	Web Developers	Associate's degree	\$66,300

a median wage threshold of \$35,339³⁵ to determine their initial list of foundation occupations. Occupations typically requiring a PhD or Professional degree, along with occupations that typically require a high school diploma only or less were excluded from the initial list of foundation occupations; as were managerial or director occupations and occupations with a title of 'all other'. The final filter was the inclusion of all Local Workforce Board-identified occupations in which five or more Boards listed the occupation.

Every region has a different set of filters based on their size and growth patterns. Occupational labor market data was collected and organized for the nine-county Workforce Solutions Rural Capital Area Board region (excluding Travis County) using the JobsEQ platform from Chmura Economics. Projections for the 2019-2029 period were developed, along with 2017 wage data and online job postings for 2019. Filters used include occupations with wages above \$43,700, occupations which added 20 or more jobs between 2016-19, those with a projected percent change above 29.5%, and occupations with ten (10) or more online job postings. Eliminated from the list were occupations requiring a PhD or Professional degree or Master's degree, occupations that were managerial in nature due to the experience issue, and occupations that list 'all other' in the title due to the imprecise understanding of specific market demand and education/training associated with jobs therein listed.

By definition, an occupational filtering approach is deductive, meaning it only allows occupations to remain on a list if they meet all proposed criteria. Thus, for example, once a wage threshold is established at the local level and an occupation pays one dollar less than that threshold, it is eliminated from the list. The occupation might otherwise have high levels of demand, high concentrations of employment in a state or region, significant numbers of online job openings, or be critical to an emerging industry. This limitation suggests the need for alternate, albeit complimentary approaches to generate a final list of Target Occupations and the importance of well-documented 'local wisdom'.

³⁴ A formal review process resulted in several additional occupations which showed significant labor market opportunity across several indicators but fell just below one or more of the official parameters. These occupations were subsequently added to the list with appropriate documentation.

³⁵ The EMSI *Analyst* tool provides considerable flexibility for these types of analyses. Moreover, the 2016-2026 projections from the TWC/LMCI department were not available until September 2018, necessitating the use of alternate projections data resources.

Critical Occupations: An Industry Targeting Approach

An alternate methodology to identify regional occupational ‘tent poles’ is the Industry Targeting Approach. To really understand the occupational needs of a labor market, it is important to understand how that region developed, which industries form the economic foundation of the region, how those industries are performing, and what are their likely occupation and skill needs. Ironically, the simple answer to the question of where is occupational demand likely to emerge is generally that most opportunities will occur in industries and occupations in which most of the current jobs exist. This stems from the fact that most regions have a unique industrial structure that is the result of regional comparative advantage, i.e. retail opportunities around fast-growing population centers or a hospital cluster that grows up around a medical school.³⁶

To identify which occupations meet the definition of ‘critical’ to the regional economy (defined as closely linked to growth industries and exhibiting independent growth criteria), an industrial analysis of the nine-county Rural Capital Area region was performed. Data for the analysis was obtained primarily from JobsEQ from Chmura Economics. A non-parametric exercise was conducted that ranked each industry for six key labor market variables and weights were applied that tuned the importance of the various indicators³⁷. An industry staffing pattern was then applied to each industry to create a list of occupations critical³⁸ to each of these top 15 industries.

From this list of occupations, we observed duplicates³⁹, removed occupations that had less-than-average labor market demand, and those that had education levels inappropriate for this exercise.

Just as with supply and demand analysis, regional targeting has a little bit of art to go along with the data science. There is no single right answer, no ultimate ground truth, and no omniscient crystal ball. But this process offers a legitimate and defensible starting point that can be easily augmented with other stakeholder input or ‘local wisdom’. It mirrors the occupational targeting process traditionally used by Texas Local Workforce Development Boards. It is based on sound regional economic principles of how job openings occur and how regions develop and grow. It can lead to better understanding the strengths of the regional economy, thus providing a basis for employer engagement and business collaboration. When occupational opportunities are identified through an interconnected industry

³⁶ This does not mean that skill or hiring requirements, technology knowledge or utilization, or other business practices within industries or occupations will not change over time.

³⁷ This Industry Evaluation Model (INDEVAL) approach is documented in *Where the Jobs Are: Identification and Analysis of Local Job Opportunities* (Froeschle, McKee). The weights applied for Rural Capital Area were: 15% 2019Q1 Employment (EMP), 10% Location Quotient, 20% Employment Change 2016-19 (EMP CHG), 15% Total Projected New Hires 2019-29, 20% Net Change 2019-29, 20% Percent Change 2019-29.

³⁸ ‘Critical’ in this instance is defined as 1.0% or more of the industry staffing pattern.

³⁹ Occupations which show up under multiple industries is a good indicator of a ubiquitous occupation.

Rural Capital Industry Evaluation Rank Orders Table

NAICS	Industry	2019Q1 EMP	LQ	EMP CHG 2016-2019	Total New Hires	ABS CHG 2019-29	PER CHG 2019-29	INDEVAL Quotient
INDEVAL Weights - 15% EMP 2019Q1, 10% Location Quotient, 20% EMP CHG 2016-19, 15% Total Projected New Hires 2019-29, 20% NET CHG								
2371	Utility System Construction	21	9	16	17	12	23	17
2382	Building Equipment Contractors	5	52	4	4	3	49	18
4931	Warehousing and Storage	27	63	3	16	14	15	19
5415	Computer Systems Design and Related Services	12	116	6	20	4	20	22
7225	Restaurants and Other Eating Places	1	65	1	1	1	80	23
2381	Foundation, Structure & Building Exterior Contractors	11	28	29	12	13	56	26
4411	Automobile Dealers	18	58	25	10	16	41	26
6241	Individual and Family Services	31	184	8	11	5	4	28
2389	Other Specialty Trade Contractors	13	24	9	13	18	82	28
5617	Services to Buildings and Dwellings	6	102	7	6	7	73	29
6213	Offices of Other Health Practitioners	37	83	22	38	20	11	30
6244	Child Day Care Services	24	59	13	18	22	57	31
5419	Other Professional, Scientific, and Technical Services	25	51	15	29	21	53	31
5416	Mgmt., Scientific, and Technical Consulting Services	30	132	19	28	19	27	35
6111	Elementary and Secondary Schools	2	36	2	2	2	152	35

analysis, or when the time comes for program completers to find jobs, one can follow the same industrial targeting process and identify employer contacts that comprise the targeted industries list and who are thus more likely to have job opportunities.

Critical Occupations from Targeted industries

NAICS	SOC	Description	Employed in Industry (2018)	% of Total Jobs in Industry	Median Annual Earnings	Typical Entry Level Education
5416	13-2011	Accountants and Auditors	91	2.5%	\$58,098	Bachelor's degree
4411	49-3021	Automotive Body and Related Repairers	65	1.5%	\$40,715	High school diploma or equivalent
2381	47-2021	Brickmasons and Blockmasons	127	2.5%	\$41,042	High school diploma or equivalent
5416	13-1199	Business Operations Specialists, All Other	84	2.3%	\$70,049	Bachelor's degree
6241	21-1021	Child, Family, and School Social Workers	87	3.1%	\$41,486	Bachelor's degree
5415	15-1143	Computer Network Architects	86	1.1%	\$120,434	Bachelor's degree
5415	15-1152	Computer Network Support Specialists	82	1.1%	\$57,741	Associate's degree
5415	15-1199	Computer Occupations, All Other	147	1.9%	\$77,918	Bachelor's degree
5415	15-1131	Computer Programmers	256	3.4%	\$79,583	Bachelor's degree
7225	15-1121	Computer Systems Analysts	504	1.3%	\$84,571	Bachelor's degree
5415	15-1121	Computer Systems Analysts	504	6.6%	\$84,571	Bachelor's degree
5416	15-1121	Computer Systems Analysts	68	1.9%	\$84,571	Bachelor's degree
5415	15-1151	Computer User Support Specialists	312	4.1%	\$46,956	Some college, no degree
2382	13-1051	Cost Estimators	98	1.3%	\$65,013	Bachelor's degree
2381	13-1051	Cost Estimators	71	1.4%	\$65,013	Bachelor's degree
2389	13-1051	Cost Estimators	52	1.1%	\$65,013	Bachelor's degree
2389	53-7021	Crane and Tower Operators	104	2.1%	\$48,827	High school diploma or equivalent
6244	11-9031	Education Administrators, Preschool & Childcare Center	97	2.6%	\$40,966	Bachelor's degree
2371	49-9051	Electrical Power-Line Installers and Repairers	123	3.0%	\$56,201	High school diploma or equivalent
2382	47-2111	Electricians	1,209	15.6%	\$43,275	High school diploma or equivalent
2389	47-2111	Electricians	68	1.4%	\$43,275	High school diploma or equivalent
2371	47-2111	Electricians	43	1.0%	\$43,275	High school diploma or equivalent
6111	25-2021	Elementary School Teachers, Except Special Education	323	16.7%	\$51,156	Bachelor's degree
5416	43-6011	Executive Secretaries and Executive Administrative Assistants	47	1.3%	\$52,015	High school diploma or equivalent
6111	25-2031	High School Teachers, Ex. Special ED & CTE	250	12.9%	\$51,675	Bachelor's degree
5416	13-1071	Human Resources Specialists	58	1.6%	\$54,797	Bachelor's degree
5419	27-3091	Interpreters and Translators	164	5.7%	\$54,187	Bachelor's degree
6111	25-2012	Kindergarten Teachers, Except Special Education	31	1.6%	\$46,527	Bachelor's degree
5416	13-1111	Management Analysts	754	20.9%	\$75,533	Bachelor's degree
5416	13-1161	Market Research Analysts and Marketing Specialists	187	5.2%	\$70,493	Bachelor's degree
5419	13-1161	Market Research Analysts and Marketing Specialists	49	1.7%	\$70,493	Bachelor's degree
6213	31-9011	Massage Therapists	111	4.4%	\$41,256	Postsecondary nondegree award
6111	25-2022	Middle School Teachers, Ex. Special ED & CTE	174	9.0%	\$49,636	Bachelor's degree
2371	49-3042	Mobile Heavy Equipment Mechanics, Except Engines	48	1.2%	\$41,821	High school diploma or equivalent
5415	15-1142	Network and Computer Systems Administrators	150	2.0%	\$81,817	Bachelor's degree
6213	31-2011	Occupational Therapy Assistants	28	1.1%	\$68,200	Associate's degree
6213	31-2021	Physical Therapist Assistants	93	3.7%	\$61,626	Associate's degree
2382	47-2152	Plumbers, Pipefitters, and Steamfitters	1,221	15.7%	\$45,331	High school diploma or equivalent
2371	47-2152	Plumbers, Pipefitters, and Steamfitters	126	3.0%	\$45,331	High school diploma or equivalent
2389	47-2152	Plumbers, Pipefitters, and Steamfitters	68	1.4%	\$45,331	High school diploma or equivalent
4931	43-5061	Production, Planning, and Expediting Clerks	33	1.1%	\$42,288	High school diploma or equivalent
5416	27-3031	Public Relations Specialists	36	1.0%	\$53,492	Bachelor's degree
6241	29-1141	Registered Nurses	31	1.1%	\$62,484	Bachelor's degree
6213	29-1141	Registered Nurses	26	1.0%	\$62,484	Bachelor's degree
5415	41-3099	Sales Representatives, Services, All Other	214	2.8%	\$44,312	High school diploma or equivalent
5416	41-3099	Sales Representatives, Services, All Other	170	4.7%	\$44,312	High school diploma or equivalent
2382	41-3099	Sales Representatives, Services, All Other	132	1.7%	\$44,312	High school diploma or equivalent
5617	41-3099	Sales Representatives, Services, All Other	121	1.7%	\$44,312	High school diploma or equivalent
4411	41-3099	Sales Representatives, Services, All Other	70	1.6%	\$44,312	High school diploma or equivalent
2381	41-3099	Sales Representatives, Services, All Other	54	1.1%	\$44,312	High school diploma or equivalent
2389	41-3099	Sales Representatives, Services, All Other	47	1.0%	\$44,312	High school diploma or equivalent
5419	41-3099	Sales Representatives, Services, All Other	42	1.4%	\$44,312	High school diploma or equivalent
5415	41-4011	Sales Reps, WH & Manufacturing, Technical/Scientific Products	123	1.6%	\$106,588	Bachelor's degree
2382	47-2211	Sheet Metal Workers	194	2.5%	\$43,527	High school diploma or equivalent
7225	15-1132	Software Developers, Applications	718	1.9%	\$107,214	Bachelor's degree
5415	15-1132	Software Developers, Applications	718	9.4%	\$107,214	Bachelor's degree
5416	15-1132	Software Developers, Applications	51	1.4%	\$107,214	Bachelor's degree
5415	15-1133	Software Developers, Systems Software	285	3.7%	\$101,920	Bachelor's degree
6111	25-2054	Special Education Teachers, Secondary School	19	1.0%	\$49,802	Bachelor's degree
2381	47-2221	Structural Iron and Steel Workers	155	3.1%	\$40,117	High school diploma or equivalent
6241	21-1018	Substance Abuse, Behavior, & Mental Health Counselors	97	3.4%	\$42,924	Bachelor's degree
6213	21-1018	Substance Abuse, Behavior, & Mental Health Counselors	28	1.1%	\$42,924	Bachelor's degree
2371	49-9052	Telecommunications Line Installers and Repairers	96	2.3%	\$45,405	High school diploma or equivalent
6213	29-1129	Therapists, All Other	25	1.0%	\$62,391	Bachelor's degree
5415	15-1134	Web Developers	175	2.3%	\$52,077	Associate's degree

The Search for Convergent Validity: A Final Target Occupations List

The final process of combining all the statistical evidence is essentially a search for convergent validity. Each of the efforts contributed some understanding of the regional labor market. Occupations identified from the Occupational Indicators approach started as the base list. Because the occupational filtering method can eliminate occupations that may otherwise be strong candidates despite failing just one filter threshold, occupations that appeared on the original Workforce Solutions Rural Capital list but did not make the cut based on one or more labor market variables were revisited to see if they should be reconsidered. Indeed, thirteen of these occupations were added to the final list because they missed only one filter threshold, held significant promise based on other labor market variables, or were supported by local wisdom.

Final List of Targeted Occupations for Workforce Solutions Rural Capital Area						
List	SOC	Occupational Title	On Rural Cap Target List	On Critical OCCs List	Competitive Education Requirement (CER)	Avg Ann Wages 2017
<i>Occupations with wage above \$43,700, added 20 or more jobs 2016-19, PCT CHG above 29.5%, had 10 or more online job postings, eliminated occupations requiring a PhD, Professional degree or Master's degree, eliminated occupations that were Managerial in nature due to experience requirement OR occupations from Critical list from INDEVAL (minimum market criteria) OR occupations on current Rural Capital list exempted for one or more reasons</i>						
	SOC	Total - All Occupations				\$43,700
1	13-2011	Accountants and Auditors		YES	Bachelor's degree	\$67,400
2	49-3021	Automotive Body and Related Repairers			Recognized Industry Credential	\$45,000
3	49-3023	Automotive Service Technicians and Mechanics	EXEMPT 1		Recognized Industry Credential	\$46,100
4	43-3031	Bookkeeping, Accounting and Auditing Clerk	EXEMPT 5		Some College, No Degree	\$38,700
5	15-1121	Computer Systems Analysts		YES	Bachelor's degree	\$85,600
6	15-1151	Computer User Support Specialists	YES	YES	Associate's degree	\$47,000
7	13-1051	Cost Estimators		YES	Bachelor's degree	\$68,700
8	15-1141	Database Administrators			Bachelor's degree	\$83,700
9	31-9091	Dental Assistants	EXEMPT 1		Recognized Industry Credential	\$38,500
10	29-2021	Dental Hygienists			Associate's degree	\$76,600
11	49-9051	Electrical Power-Line Installers and Repairers	YES	YES	Recognized Industry Credential	\$54,600
12	47-2111	Electricians	YES	YES	Recognized Industry Credential	\$47,500
13	27-1024	Graphic Designers			Bachelor's degree	\$52,300
14	49-9021	Heating, A.C. & Refrigeration Mechanics/Installers	EXEMPT 1		Recognized Industry Credential	\$38,900
15	53-3032	Heavy and Tractor-Trailer Truck Drivers	EXEMPT 1		Recognized Industry Credential	\$39,600
16	13-1071	Human Resources Specialists			Bachelor's degree	\$62,400
17	49-9041	Industrial Machinery Mechanics	EXEMPT 2		Recognized Industry Credential	\$47,300
18	15-1122	Information Security Analysts	EXEMPT 3		Bachelor's degree	\$102,300
19	29-2061	Licensed Practical Vocational Nurses	YES		Recognized Industry Credential	\$43,700
20	51-4041	Machinists	EXEMPT 1,2		Recognized Industry Credential	\$41,700
21	49-9071	Maintenance and Repair Workers, General	EXEMPT 1,4		High School Diploma or GED	\$34,500
22	13-1111	Management Analysts		YES	Bachelor's degree	\$88,600
23	29-2012	Medical and Clinical Laboratory Technicians			Associate's degree	\$46,200
24	29-2011	Medical and Clinical Laboratory Technologists			Bachelor's degree	\$46,300
25	31-9092	Medical Assistants	EXEMPT 1		Recognized Industry Credential	\$29,800
26	29-2071	Medical Records & Health Information Techs	EXEMPT 1		Recognized Industry Credential	\$35,100
27	23-2011	Paralegals and Legal Assistants			Associate's degree	\$45,100
28	31-2021	Physical Therapist Assistants		YES	Associate's degree	\$57,100
29	47-2152	Plumbers, Pipefitters, and Steamfitters	YES	YES	Recognized Industry Credential	\$46,800
30	29-2034	Radiologic Technologists			Associate's degree	\$54,100
31	29-1141	Registered Nurses		YES	Bachelor's degree	\$63,700
32	29-1126	Respiratory Therapists			Associate's degree	\$54,900
33	47-5012	Rotary Drill Operators, Oil & Gas	EXEMPT 4,5		High School Diploma or GED	\$51,600
34	47-5013	Service Unit Operators, Oil, Gas & Mining	EXEMPT 4,5		High School Diploma or GED	\$47,100
35	21-1093	Social and Human Service Assistant	EXEMPT 1,5		Some College, No Degree	\$33,300
36	15-1132	Software Developers, Applications	YES	YES	Bachelor's degree	\$97,700
37	29-2055	Surgical Technologists			Recognized Industry Credential	\$44,100
38	25-0000	Teachers (multi-grade, multi-discipline, certification)	EXEMPT 5		Bachelor's degree	\$55,080
39	15-1134	Web Developers	YES	YES	Associate's degree	\$66,300
40	51-4121	Welders, Cutters, Solderers, and Brazers	EXEMPT 1		Recognized Industry Credential	\$41,700
Exemption Codes: EXEMPT 1 - Wages, EXEMPT 2 - PCT Growth, EXEMPT 3 - Historic EMP CHG, EXEMPT 4 - Education, EXEMPT 5 - Local Wisdom						

⁴⁰Texas occupational employment data by education level from the Census American Community Survey PUMS.

⁴¹Note that several occupations appear multiple times on the chart labelled Critical Occupations from Targeted Industries. These are occupations that are found in more than one identified Target Industry.

Eight occupations from the filtered process were eliminated because of competitive education concerns; namely that many incumbents held graduate degrees making them unsuitable for workforce training services⁴⁰.

All occupations that appeared on the critical list for three or more industries were included except for Sales Representatives, Services, All Other⁴¹. However, this occupation appeared in the critical staffing pattern of eight different industries, so it should not be ignored. In fact, 'sales skills' routinely show up among the top skills in demand by regional employers. This occupation, along with Business Operations Specialist, All Other, was eliminated from the final list because it is an 'all other' occupational category and cannot be definitively linked to any single training program or credential. Aside from this limitation, both occupations showed evidence of strong labor market demand. This may be an area where additional regional stakeholder input can provide some guidance.

For this exercise and in response to a series of regional employer listening sessions, several additional occupations were added to the final list based on stakeholder 'local wisdom'. Ultimately, Workforce Solutions is charged with helping both employers and job seekers realize their employment objectives. There are some industries such as Child Care Services, that have an overall lower pay scale and yet are adding jobs at a rapid clip and are badly in need of workers (especially those with entry level credentials). Although Child Care Workers did not make the final Target Occupations list because of low pay, the following occupations were added based on other regional economic phenomena and local wisdom:

1. Because the eastern counties of the Rural Capital Area fall within the Eagle Ford Shale basin, there may also be opportunities related to the oil and gas sector. Indeed, input from regional stakeholders confirmed labor shortages for Rotary Drill Operators and Service Unit Operators – both of which were added to the Target Occupations list as a result of local wisdom.
2. Population growth, including movement of workers from the city of Austin to outlying counties that fall in the more affordable Rural Capital region, is driving demand for many population-serving occupations. Teachers at all levels were added to the list based on increased demand and increasingly higher rates of turnover. The same case can be made for Social and Human Services Assistants who provide client and family support services in a wide variety of fields to help clients find benefits or community services. This is consistent with general labor shortages reported by Rural Capital Area employers in a variety of personal interviews.
3. Rural counties tend to be characterized by fewer and smaller business enterprises. Most small businesses don't need and can't afford a certified Accountant to keep track of their books. This work is often offloaded to Bookkeeping, Accounting, and Auditing Clerks which show significant demand growth through the end of the projections period.

The final list of 40 Target Occupations represents an effort to consider data from several sources using multiple approaches. Ultimately, 'local wisdom' should always play a part in the development of any Target Occupations list. Namely, there may be other occupations in demand as recognized by regional employers or other key stakeholders that do not show up using data-driven approaches. Rather than exclude regional stakeholder input, Workforce Solutions Rural Capital Area staff judiciously considered such feedback, documented the rationale behind any additions or deletions, and created a comprehensive, data-driven list of Target Occupations that can be used for both Workforce Solutions training directives and as a guidepost for the secondary and post-secondary education communities to improve the alignment between program offerings and the regional labor market.