

A photograph of a suspension bridge with a white archway in the distance. The bridge has a wooden deck and metal truss supports. The sky is blue with white clouds. The text is overlaid on the image.

Everyone Starts Somewhere

**Career Pathways to
Heart of Texas
Target Occupations**

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Acknowledgements

It is often said that a project's outcomes can be no better than the caliber of those that commit to its successful execution. This project was fortunate to benefit from the capabilities and efforts of many talented and dedicated individuals.

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One of the strengths of a project like this is to have front line validation from the regional business community. Insights from regional employers provide the nuance of hiring preferences and expectations that can't be discerned through statistical analysis alone. 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 ten Heart of Texas employers are truly engaging and important.

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Project Director and principal investigator Richard Froeschle was responsible for pulling all the pieces together 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.

Everyone Starts Somewhere

Career Pathways to Heart of Texas

Target Occupations

“Luck is what happens when preparation meets opportunity.” Seneca, Roman Philosopher

The world of work has gotten more complex. The job market offers more opportunities than ever for those that are prepared, and more difficulties for those who are not. Career decision-making has never been more challenging, and understanding the relationship between education and job opportunities has become increasingly important. Yet, definitive intelligence on where the jobs are, where they will be, and how to prepare remains elusive.

In a 2017 Gallup-Strada survey on where students get information on career major choices, the most significant source was through informal social networks such as friends and family (55 percent), while only 44 percent relied on formal networks such as school counselors. The source they used least often, and yet found most helpful, was informal work based information with 83 percent citing the helpfulness of this source. The informal work based source is information directly from employers.

The title of this report, *Everybody Starts Somewhere*, also represents a simple truth about the labor market. Nobody wakes up one day with a job as an Electrical Engineer or a General Manager. There is considerable time, energy, sacrifice, effort and guidance that goes into the process. The notion of ‘paying your dues’ implies that there is work to be done, plans to be made, and time to be invested if you want to achieve higher career aspirations. Useful labor market information 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 study¹ 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.

“Where I am today is my starting point. Who I am today is my starting point. My failures and successes of the past, my fears and hopes of the future are all shadows. Today is my reality, and I’ll use it to create my world.”

Taylor Stevens, author

1 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.”

But while improved articulation is a worthy and important pursuit that can affect the first 2, 4 or 8 years of a student's education, 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.

This project by Workforce Solutions Heart of Texas is designed to address the two needs 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, and to serve as a better, more 'helpful' formal source of such intelligence. To achieve this objective, and consistent with the Gallup-Strada survey, as part of this project the Board turned directly to employers to ask them what they value in terms of worker preparation. Rather than conducting a scattershot employer survey, project staff conducted in-depth interviews with regional hiring authorities to get the 'informal work based' information that Gallup reports to be so valuable to students.

In addition, and especially for those that are already in the labor market, it is important to look beyond career pathways and explore the concept of career progressions. 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 developed for Workforce Solutions Heart of Texas are built 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. In this case, the career progressions are linked to the list of Target Occupations already identified by experts in the Heart of Texas as offering above average job and earning possibilities.

Career Pathways versus Career Progressions and the Career Lattice

The concept of a career pathway can mean many things to different audiences. In most cases, this term is used to describe educational curricula organized around an employment centered goal. It often includes the notion of building an articulated portfolio of skills or credentials to help a student prepare to compete for desirable a.k.a. ‘good’ jobs. In almost every case, a career 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 pathways².

At the national level, the National Career Pathways Network helps educators and employers from across the country become involved in career technical education and pathways programs. The Department of Labor’s Employment and Training Administration (DOL/ETA) has developed a guide titled *Career Pathways Toolkit: An Enhanced Guide and Workbook for System Development* to assist local workforce boards promote career pathways as part of the Uniform State Plan submitted by each state. (The six elements of the DOL Career Pathways Model and represented in the graphic below).

² There are many efforts underway in Texas to promote career pathways and encourage students’ take courses that are grouped together around a career aspiration. HB 5 created five ‘endorsements’ designed to help provide 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.



There are also many career pathways projects at higher education institutions. *The Career Ladders* project from the Board of Governors of the California Community Colleges offers a useful definition of career pathways as “a series of structured and connected education programs and support services that enable students, often while they are working, to advance over time to better jobs and higher levels of education and training”. But moving from an entry level position to a better paying job usually requires additional experience, more responsibility and enhanced skills. Plus, at some point there must also be an understanding of what constitutes a ‘better’ job. This discussion of career pathways highlights some of the critical elements in determining the connections between education and the labor market. More importantly, it introduces the concepts of career progression and career lattice, both of which are uniquely approached from the perspective of the labor market and continuous skill acquisition.

Many career pathways models excel at course or credential alignment, but are deficient when it comes to understanding the relationships among occupations. They focus on a single occupational objective and often ignore what happens to a student after they enter the labor market. Moreover, most career pathway models assume that a career progression is strictly correlated with - an even a function of - increasingly advanced formal credentials. But while there is a strong correlation in the aggregate between education and earnings, a career progression is largely determined by the acquisition of skills and experience over time. Additional postsecondary credentials can serve as bridges to higher tiers of better paying jobs, but they are not necessarily prerequisite.

Almost everybody will start with an entry level job, which may or may not be related to the education and training they received in high school or during post-secondary pursuits. Once they enter the labor market, that student is likely to spend the next 40 years in the labor force, building a work life that is increasingly likely to experience job and career change, spells of unemployment or underemployment, and accompanying shifts in work and life priorities.

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.

In decades’ past, the concept of a career progression 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 sal-

“As changing companies is common among today’s professionals, shifting careers from one industry to another is also happening more frequently. The portability of professional skills from industry to industry means that people now have more options to switch industries without having to restart their careers from square one.”

Andrew Kritzer, LinkedIn

ary, and the timing of each move was determined by company management. Changing industries was relatively rare because it often meant ‘starting over’ and loss of the 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 becomes 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.

The Census Bureau’s American Community Survey (ACS) makes available data that shows the occupation of employed workers for those that received a Bachelor’s degree or higher. These data reveal some very interesting, though undocumented career and life decisions about the connection between formal education and employment. If nothing else, these data show that not all educational pathways result in their intended careers³. Workers often advance in their careers along avenues that have little to do with their formal education or previously leveraged skill sets. It also offers evidence that the concept of an individualized career pathway extends far beyond initial educational preparation, however well-conceived.

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, 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

“The middle-skill labor market and training market is not well advertised and communicated for a lot of job seekers. There are a lot of pathways with community colleges, union-run programs, apprenticeship programs, and there is confusion about the pathways to get the training and education. We don’t talk about those job opportunities as much as we should.”

Kermit Kaleba, federal policy director for the National Skills Coalition

³ For example, the most common occupations for Texas workers with a Bachelor’s degree in Physics are College Instructor, Software Engineer, Manager, and Systems Analyst. For History majors, the most common occupations in which workers are found are Lawyer, Elementary School Teacher, College Instructor, and Manager.

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.

Career Progressions and the WIOA

The new 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 Heart of Texas 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 Heart of Texas

As discussed above, this career progressions project is intended to help the Heart of Texas 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 education, especially showing the potential return on investment for recognized postsecondary credentials.

The need to increase earnings is a major driver for most career change, 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, a single person living in McLennan County (Waco) must make \$9.78 an hour (\$20,342) to achieve a living wage. However, that wage rises to \$21.19 per hour (\$44,075) for a single worker with one child, and to \$25.56 per hour (\$53,164) 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.

Unrealistic salary expectations are not unusual, even for those with postsecondary credentials and especially among youth. For example, a 2011 Charles Schwab money survey found that teens naively expected to earn \$73,000 as a starting salary and \$150,000 once they are established in their career. Each lattice shows an upward wage progression, but also visually demonstrates that starting salaries are often much lower than imagined, and earnings growth often requires additional postsecondary education.

In addition to unrealistic salary expectations, younger workers are often surprised to learn how much it costs to live. The Texas Workforce Commission provides an online budget calculator called 'Reality Check' designed to raise awareness of the cost of living. A worker who earns \$9.78 per hour (the amount cited above as the living wage for Waco) who is working full-time can expect to earn \$1,695 per month. That buys a studio apartment, and assumes a used car, basic utilities, cell phone/internet, and eating at home. There is no extra cash for eating out, entertainment, vacation, or household purchases. It assumes eating at home and does not include health care, savings or any emergency money. In other words, a bare bones lifestyle. The actual salaries in the Heart of Texas region shown on the career progression lattices help bring that 'reality check' into focus.

A career progression lattice⁴ 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.

A major gap in our recruitment process is that most college graduates tend to have unrealistic desired salaries. This puts a strain in our recruitment since we normally eliminate a candidate who is asking for way more than our starting salary for the position they are applying for."

***Nadya Velazquez,
HR manager at the
Riverside Hotel in Fort
Lauderdale***

⁴ Broward College has another good example of a career ladder map that helps students visualize an upwards earnings path; albeit within a particular education discipline. See <http://www.broward.edu/academics/programs/career-ladders/Pages/default.aspx>.

The lattices are transferable skill-based and built around likely skill requirements of regional employers. Occupations included in each lattice are customized to the employment and wage composition of the Heart of Texas 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 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 by taking ownership of learning goals
- increased persistence, creativity and risk-taking in achieving goals
- increased achievement/success rates in education
- improved self-regulation by establishing task-related actions, taking responsibility for learning,
- reduced undermining effects of anxiety, frustration, and disappointment
- enhanced joy, pride & confidence as a result of higher levels of engagement

A career lattice lets an individual visualize a path for occupational mobility, and helps focus attention on personal development. The lattice or career map can be used to lay out an occupational goal, identify action steps, measure progress, and keep one 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".

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

Yogi Berra

From the Employer Perspective

Individual Interviews with Heart of Texas Employers

This career progressions study is primarily a data-driven exercise. The twenty-three (23) Anchor occupations represent entry-level positions and each successive tier on a career progression lattice shows how a worker can leverage their transferable skills into higher paying occupations; especially those on the HOT Target Occupations list. But by itself, data doesn't always tell the whole story. A perfect example is the television show, *Dirty Jobs* in which host Mike Rowe spends a day in the life of workers at jobs about which most people know very little. As a media phenomenon, *Dirty Jobs* concentrated largely on jobs in which workers combined physical work with unique knowledges and skills. Most important, the show made jobs come alive for the viewer.

Most labor market intermediaries think they know something about labor market demand and employability. In truth, the task of knowing how to contribute to the preparation of unemployed or dislocated workers is a daunting task. The economy is very diverse and the skill expectations of one company do not always conform with the hiring requirements of another. Qualifications vary based on occupation or job, but they also vary based on whether the job will be in a leadership position.

Some organizations value experience, while others hire exclusively based on attitude and 'cultural fit'. To talk to one or two – or ten – companies about worker qualifications is hardly reflective of the entire regional economy. As TSTC vice-chancellor and SkillsEngine founder Michael Bettersworth notes, "there is no such thing as a perfect Accountant profile". He refers to companies that may hire under the same occupational titles, in the same region, and yet can have different hiring requirements based on unique organizational culture and business processes. On the other hand, in the course of gathering such first-hand feedback from the local business community there are common themes that emerge.

As part of this initiative, we conducted ten (10) personal interviews with regional employers to discuss first-hand their perspectives on worker preparation, their unique thoughts on their company hiring requirements, and what makes a fully qualified or exemplary worker for them. The purpose of these conversations was to identify and document both the required and the undiscovered, or perhaps less explored, skill requirements and talent assessment as viewed by key regional employers. While not on the same scale as *Dirty Jobs*, the interviews in this report provide many unexplored insights on what it takes to work for various companies in the Heart of Texas.

Common Themes from the Heart of Texas Business Community

Hiring managers at companies across the Waco region need workers, yet consistently complain that they are not getting enough job applicants with the right mix of skills and experience for their open jobs. This is a common complaint.

The economy of the Waco region is growing, but it is best characterized as a steady growth. When a region gets a sudden economic stimulus, such as from many new employers entering and hiring available workers, existing employers tend to become extra flexible in their hiring practices -- by raising starting wages, by offering more training, by cooperating more with the local schools and workforce board in recruiting.

As Waco area employers recognize that they need more skilled workers, but have not yet reached that tipping point where they are taking a lot of proactive recruiting action, this opens outreach opportunities for the Heart of Texas workforce board. As such, the HOT board may want to consider offering more short-term or short program skill-training options.

Every employer interviewed for this report complained about lack of 'soft skills', most notably communication skills, among job applicants -- and of their own existing workers. The HOT workforce board could consider having its best Workforce Solutions employment counselors or even speech instructors from the community colleges to teach some short-term communication skills classes for job seekers.

One of the most successful 'soft skill' worker training programs in Texas is run by the Coastal Bend workforce board in Corpus Christi. The board sponsors a 4-day 'Skills Training' certificate program for long-term unemployed workers. The instructors say the real issue is that the program gets job seekers to practice communication skills and boosts their personal confidence, both of which were issues noted in various interviews. Participants also are given labor market information about the kinds of industries, occupations, typical pay and available jobs in the Corpus Christi area. After 4 days of classes they get a certificate from the Workforce Solutions and Del Mar College.

Another issue among employers in the Heart of Texas region is industry certifications. Most of the employers say they do not require industry certifications to land a job at their company. Still, all employers say that job applicants with a basic industry certificate are more valued and get extra consideration for open jobs. Certificates seem to be a "nice to have rather than a need to have" in the Waco region. This finding is consistent with company feedback from the Killeen/Temple region, as noted in a similar study for Workforce Solutions of Central Texas.

The HOT Workforce Board may want to consider supporting some short-term certification classes for such certificates as the basic OSHA safety class or the Class D Water license, both of which were noted by multiple employers.

The Workforce Solutions offices in the Heart of Texas have a good reputation with local employers. But a lot of job applicants sent from the local Workforce Solutions office do not have a good reputation among employers. The referral of unqualified or unprepared workers is a common complaint. Some of the stories are stunning, including reference to workers who showed up at a job interview at a frozen chicken processing plant wearing pajamas and flip flops - and who were, of course, sent home without a job. The HOT workforce board may want to consider having employment counselors tell stories of people who prepared for their job application and interview and those who did not.

Again, the labor economy of the Waco region is growing concomitant with its population. So too is the road and infrastructure expanding, along with the reputation for regional quality of life. Regional employers are only going to need more workers. These concerns about local job applicants not quite having the right skills for new and existing jobs will continue to grow, and offer an opportunity for the HOT Workforce Board to take action and help.

Allergan in Waco, Texas

Interview on Sept. 7, 2017, with Thomas Hervey, human resources manager

Allergan runs its plant on the south side of Waco like a space station where the 407,000-square foot facility must be clean and secure, where all work must be documented, and all 750 employees must follow aseptic cleanliness protocols to ensure safe and quality products, and to ensure compliance with U.S. and international regulatory agencies.

“It’s a very controlled environment. Employees are required to comply with specific dress requirements in production areas, including lab coats, counter coats, and/or head-to-toe gowning, depending on the specific department and position,” said Thomas Hervey, Allergan Senior Human Resource Manager. “It’s a very clean, bright, modern environment, with high-tech production lines, including robotics.”

“It can be a difficult environment to work in for those who have never worked in the pharmaceutical industry before. Employees have to be very detailed-oriented, be able to follow and comply with Standard Operating Procedures, and adhere to strict, Good Documentation Practices. Regulatory agencies, such as the U.S. Food and Drug Administration, and international equivalents, audit our facility on a regular basis. We can be asked, at any time, to provide any documents or information used to support production of our products,” Hervey said.

Allergan's corporate headquarter is located in Ireland, with administrative headquarters in New Jersey. Allergan has become a leader in a new industry model – Growth Pharma. Allergan is focused on developing, manufacturing and commercializing branded pharmaceuticals, devices and biologic products for patients around the world. Allergan markets a portfolio of leading brands and best-in-class products for the central nervous system, eye care, medical aesthetics and dermatology, gastroenterology, women's health, urology and anti-infective therapeutic categories.

“Employees have to be able to work in a team environment, with the ability to communicate concisely with coworkers, and value honesty and integrity,” Hervey said. “They have to have the ability to make good decisions, and communicate with management regarding critical business operations. Good communication is one of the many skills assessed during the interview and selection process. And communication can take many forms, including in-person, in writing, and electronically, such as email.”

Allergan has many production lines that make pharmaceutical over-the-counter and prescription eye care products, as well as a plastic injection molding operation, to supply the necessary containers for their products. As a result, some positions that the company most often needs to fill include the following:

- 1) Manufacturing Operator (Production Line Worker)
- 2) Packaging Operator (Packaging Line Worker)
- 3) Manufacturing Technician (Sterile Filling Operator)
- 4) Equipment Technician (Production Maintenance)
- 5) Microbiology and Chemistry Lab Technicians

Manufacturing Operators, who work on the production lines, and Packaging Operators, who work on the packaging side of the production lines managing the packaging of finished products, are some of the more entry-level positions in demand. Entry level pay is very competitive for manufacturing positions in and around the Waco area.

Manufacturing Technicians (Sterile Filling Operators), operate high-speed machinery used to fill various types and sizes of containers with product, previously mixed into batches by the Compounding department, and are typically compensated at a higher rate of pay than entry-level positions.

Equipment Technicians, or Production Maintenance Mechanics, maintain production equipment and require either an Associate's degree in industrial maintenance or related field, or a high school diploma or general equivalency degree (GED), with appropriate years of experience, depending on the level of position.

Allergan requires all of these employees to have a minimum of a high school diploma or general equivalency degree. The company also prefers, or requires

in some positions, appropriate years of relevant work experience, preferably in pharmaceuticals, food and/or beverage manufacturing, or any manufacturing as appropriate.

“It’s important that employees understand and can adhere to current Good Manufacturing Practices, Good Documentation Practices, and all safety requirements,” Hervey said.

Many of the Chemistry and Microbiology positions, as well as Engineers, for example, require a Bachelor’s degree. For some of those positions, prospective employees must also have an appropriate amount of relative experience based on the position. Allergan does not require that its workers have industry certifications, but it is viewed as preferable when applicants are being considered for specific positions.

Allergan has a robust recruiting and job interviewing process to attract, hire, and retain workers who have a unique blend of education, soft skills and the ability to work in a demanding, fast-paced, procedural-driven environment. “We find it a challenge to locate individuals with pharmaceutical experience in the local area,” he said.

Allergan uses centralized corporate recruiting, which coordinates with Waco’s Human Resource Departments to post openings and screen applicants. The primary method used to apply for open positions is through the Careers web page on the Allergan.com website. In addition, other recruiting tools, such as LinkedIn, are used to source qualified candidates. For open positions, for qualified candidates, the selection process may include phone interviews and/or on-site interviews. Waco utilizes the Targeted Selection method for interviews. “We are always interested in a person’s motivation for applying for positions at our location, and in pharmaceuticals,” Hervey said.

Allergan Waco routinely participates in job fairs, career fairs, and expos through Texas State Technical College, McLennan Community College, Baylor University, the Waco Chamber of Commerce, and the Heart of Texas Workforce Solutions.

Allergan also uses Adecco temporary agency to help supplement staffing needs.

“We are proud of our workforce here in Waco and feel we are an employer of choice, offering great employment and career opportunities,” Hervey said.

Comfort Keepers in Waco, Texas

Interview on Sept. 15, 2017, with Kristi Gonzales, human resources director

Finding workers with some healthcare industry experience and a friendly demeanor is what Kristi Gonzales, human resources director at Waco-based Comfort Keepers, needs most as she hires employees to care for the elderly. While those job requirements may sound modest, she has trouble finding people willing to work nights and weekends, as well as being compassionate and chatty at work.

“You can’t be a quiet introvert,” Gonzales said. “You can’t be shy. You can’t be unwilling to talk to people. You have to be able to talk to people and engage them.” Comfort Keepers is looking for people to fill its “Care Givers” positions, which go to the homes of elderly clients to do household chores, provide personal care and provide some medical attention. There are currently 23 Care Givers on Gonzales’ staff.

“You are going into a person’s home. They want to see somebody who is going to lift their spirits for the 3 to 5 hours that you’re there because you are probably the only person they are going to talk that day. And you’re probably going to be the only person they talk to until you come back the next day or in a few days.”

Gonzales interviews 12 to 15 people a week to become Care Givers for Comfort Keeper clients. She will offer 3 to 4 of those job candidates a job. A few will accept. However, most of those will work out as Care Givers in large part because of the company’s job candidate screening process.

Comfort Keepers requires that all applicants have a high school diploma or general education diploma (GED). The ideal job candidates have a certified nursing assistant (CNA) certificate along with a certificate in first aid or cardio pulmonary resuscitation (CPR) from the Red Cross. Ideal job candidates also have some experience working in the health care field or at an assisted living facility.

A typical personal care aide at an assisted living facility would rotate among seven or eight patients a day. Taking care of housekeeping and personal care for seven or eight people is physically demanding. Care Givers with Comfort Care go into the homes of one to three people each day and spend more time interacting with each client, Gonzales said.

“Whether you’ve been in this field in the past or not, because we are state regulated you have to be super organized. There’s a lot of paper work and documentation every time you go into a home,” Gonzales said. That involves recording when clients are given food, a bath, medication or even when a Care Giver brushes a client’s teeth.

“The best job applicants are super skilled and super experienced at dealing with people and super organized. Not everybody can do this job,” she said.

There’s also the background check to filter out people with a criminal past or a history of staying at a job for less than a year.

“We do background checks on everybody. And we’re not just checking back for the last seven years, we’re checking on you forever,” Gonzales said. “We don’t do credit checks. If you have bad credit that doesn’t mean you can’t be a good worker.”

Recruiting new employees is a challenge for Gonzales. She takes job applications online and in person. She attends Waco-area job fairs. She has posted flyers at the nursing school at McLennan Community College.

She has also been relying more on automated online recruiting tools; in particular Indeed and Facebook. Indeed sends her almost 100 resumes a month and about 10 are good candidates. Facebook has brought in fewer resumes but better-quality job applicants.

Still, the realities of the job are a constraint. “We don’t guarantee full-time work,” Gonzales said. “For most of our people, this is their second job. But not everybody wants a second job or unusual hours.”

“In Waco, I would like the workforce board to help publicize that there are several of us local employers who need people who can work weekends, evenings and even overnight,” Gonzales said. “I am constantly hiring to try to fill those shifts.”

Most of her Care Givers are working 12 to 20 hours a week. Workers with very little experience start at \$8 an hour while workers with experience and a CNA or CPR certification start at \$9 an hour. Employees also must have a valid Texas driver’s license and a clean driving record. Care Givers will often have to drive a client to the grocery store, the hair salon or the doctor’s office.

Still, Gonzales concentrates on the job interview during which she is listening to determine if the applicant is a compassionate person.

“It’s the trigger words they say in the interview that I’m listening for,” Gonzales said. “If they say, ‘I would treat them like they are my own grandparent’ or ‘I would go above and beyond to help them and listen to them’ then that tells me they are compassionate and that is the person we want.”

“It takes a special person to do what we do,” she said. “We have high expectations for all of our Care Givers,” Gonzales said. “Comfort Keepers has a mission where we feel that we are saving people’s lives by keeping them out of a nursing home and keeping them in their homes where they are comfortable.”

Divine Living Assistance Services in Whitney, Texas

Interview on Sept. 15, 2017, with Karen Cox, manager

Divine Living Assistance Services is always on the hunt for home health care givers and certified nursing assistants to care for the growing elderly population of central Texas.

“There’s some people who are giving people who love working with seniors. Those are the workers who work out the best,” said Karen Cox, manager at Divine Living Assistance, which is based in Whitney, Texas.

“We want somebody who has good communication skills to communicate with the family and with us,” Cox said. “We want somebody who communicates with our office staff and can fill out their paperwork. They have to tell us in the office what is going on in the home; if the client is eating or getting their medication or going to the bathroom. It’s important for us and for the family that they keep track of that.”

Divine Living Assistance staff start at \$8.75 an hour. Many of her 55 staff members are live-in care givers working 40 hours a week in the client’s home. Others are working 30 to 32 hours a week. Those longer hours are attractive to many job seekers.

Still, finding workers in the more rural communities of Central Texas has been a challenge, which is why Cox leans on the Workforce Solutions offices and tools by the Workforce Board for help.

“The Workforce Board does everything they can to try to help the community and help us get workers,” Cox said.

About four times a month she goes into the WorkInTexas.com job matching database to list new towns in which Divine Living needs workers. She learned how to navigate through WorkInTexas.com by herself and said she appreciates the database, which gives her about 20 worker leads a month.

Besides using the WorkInTexas.com job matching database, Cox also goes to several job fairs, primarily in Waco, Hillsboro and Cleburne. She also posts job notices at the nursing schools of McLennan Community College and the Tarleton State University campuses in Stephenville and Waco.

Divine Living Assistance requires that job applicants apply on the company’s website. About half of those who apply online have the minimum requirements sought by the company, which includes having a high school diploma or having passed the general equivalency development (GED) test.

The company also does criminal background checks on all job applicants, as well as background checks to determine whether the applicant is on the “misconduct list” of nursing home workers or home health workers who have gotten in trouble with the Texas Department of Aging and Disability Services, which recently became part of the Texas Department of Health and Human Services.

Job applicants who can pass the background checks and employment checks and demonstrate some communication skills and attention to detail go on to spend a few days of on-the-job training before they work with clients. Then Cox monitors them to see if they can stay on the job.

“Turnover is a big deal,” Cox said. “I don’t know what our turnover rate is. Some of our people stay with us for years and some stay only a few months. This isn’t for everybody.”

That’s why Cox focuses so much on job interviews to hear about a job applicant’s interests and passions as a person. In the interview, she’s listening for people who can explain how they get satisfaction from serving others.

“They have to love what they do. If they don’t enjoy working with older people and talking to them, then they’re not going to enjoy the job. The people who just want a \$9-an-hour job don’t tend to last. The giving people who like to help other people are the ones who last and feel more fulfilled.”

Domtar Personal Care in Waco, Texas

Interview on Aug. 24, 2017, with Scott Vernon, human resources manager

Getting people to apply for jobs at a factory that makes millions of diapers used to be a challenge for Domtar Personal Care in Waco. Now the company gets plenty of job applicants. Yet the company still has a challenge finding workers with the right mix of skills and ability.

“They never used to talk about what we did here. But today, with all of our community outreach, if you come to Waco and ask, “Where’s the diaper factory?” almost anybody can tell you,” said Scott Vernon, human resources manager at Domtar.

The factory started in 2009 and now has 175 employees. In a typical month the Domtar plant hires 3 to 5 new employees, but that number could go up later this year as the company just landed some big contracts to make store-brand diapers for children and adults. The plant can produce 750 diapers a minute using complex machines that are 250 feet long and almost two stories high. “Our machines are amazing. We can make a diaper, fold it, pack it in a bag with 24 other diapers, and get it out of the machine in seconds,” Vernon said.

Keeping those machines moving requires some unique workers.

In the last two years, Domtar has worked to increase pay for employees, enhance training for supervisors, boost recruiting, and improve the way that managers identify skills in demand.

In the past, Domtar was competing against nearby poultry processing facilities for workers. Then Domtar raised its entry-level wage from \$13 an hour to \$16 an hour, along with implementing skills-based pay raises. Vernon said the result is that Domtar is now competing for workers with a different set of neighbors such as Caterpillar, Coca Cola, M&M Mars, and Allergan.

Domtar has also added health club membership reimbursements, improved interaction processes between line workers and supervisors, and a more stringent attendance policy. The result is that in the last two years the turnover rate dropped from 19% to 15%.

Vernon is trying to balance profitability of the plant with production schedules and staff costs. That means monitoring five key job positions in the plant that need to be staffed:

- 1) Manufacturing Operator (or Mechanical Operator)
- 2) General Laborers
- 3) Warehouse Workers
- 4) Reliability Technicians (previously called Maintenance Technicians)
- 5) Quality Technicians

Manufacturing Operator (or Mechanical Operator) are the employees running the high-speed machines. Domtar needs workers who have some manufacturing work experience for these positions, which tend to earn \$20 to \$30 an hour.

General Laborers are the employees who physically move equipment and products, as well as have a general understanding of the operations of the plant. Many of these workers are also forklift drivers. General laborers earn about \$17 an hour.

Warehouse Workers are employees who move and manage products in the warehouse and need to understand inventory control. Warehouse workers typically earn from \$16 to \$20 an hour.

Reliability Technicians are employees who help keep the machines in working order. They need to have experience working with machinery and have had some advanced training for their jobs, which pay from \$16 to \$30 an hour. For these positions, Domtar prefers workers who have earned an Associate's degree in some kind of mechanical field. Many of the company's current Reliability Technicians have an Associate's degree from Texas State Technical College or McLennan Community College. The company also has had success with workers who earned a high school diploma and completed classes at the Greater Waco Advanced Manufacturing Academy.

Quality Technicians inspect the products as they come out of the machines to verify they meet the product specifications. They typically earn \$18 to \$20 an hour. For these positions, Domtar prefers workers who have an Associate's degree that can help the quality technicians understand (1) the statistics used to monitor quality control, and (2) the operations process so they can identify the cause of production problems.

"If we find somebody with a 2-year degree, that is the person we see with a golden halo above their head. They have proven that they can complete something and that they can learn," Vernon said.

Domtar needs workers who have been exposed to production machinery and can understand electronic controls for those machines.

"Finding the right talent is hard. No one comes out of technical college knowing how to run a diaper machine. We understand that," Vernon said. "At the same time, running a fryer in a fast food restaurant is not the kind of skill set we really want."

In addition to making unique products with unique machines, Domtar has a unique worker schedule. The Waco plant runs 24 hours a day and seven days a week. Staff work 12-hour shifts for four days and rotate day and night shifts every two weeks.

The company hires on the first Tuesday of the month. It usually posts a job opening on the company's website and that posting is usually copied and reposted by job postings boards, including Indeed.com.

Vernon screens the job applications looking for people with a minimum of a high school diploma or GED along with some relevant work experience. Those who pass his initial screening process are invited to come in on a Saturday morning to take a series of five tests, which include basic reading comprehension and basic mechanical aptitude testing. About 75% of the people who are invited to take the tests show up and sit for the tests, which take less than two hours to complete. About 25% pass the tests.

Those who pass the tests are invited for an hour-long interview with a panel of employees who range from managers to senior technicians.

"We ask: 'What do you think is an acceptable number of days to miss work in a year?' We want to hear only 2 or 3 days a year," he said.

To drive up the number of job applicants, Vernon has been attending job fairs and meeting community college and high school teachers and counselors from the Waco area. He also speaks in classes at TSTC and MCC and is a regular

attendee at the regional “STEM Expo” event in October in Waco. This year he will be giving away fidget spinners with the Domtar logo, which he expects will be a popular draw to get students to come to the Domtar booth and let him tell them about future jobs at the plant.

Vernon is also a frequent speaker at school counselor and teacher training events where he does something rare for a human resources professional: he invites them to bring high school students to tour the facility and see the production and employees in action. Lorena High School and Midway High School now take students for annual field trips to the diaper factory.

At each recruiting event or outreach event, Vernon stresses the need for soft skills at his plant.

“There are individuals who are engaged, who are willing to come to work on time and work when they are here. There are enthusiastic people out there. I will take these people even if they don’t have technical skills because we can train them and they are great people to work with,” Vernon said. “Those are the people I want.”

But his most successful recruiting effort has come from job fairs and hiring events sponsored by the Heart of Texas Workforce Board. His relationship with the Board has worked out so well that Vernon uses Workforce Solutions staff to help with leadership training for Domtar supervisors to supplement the leadership training they do through TSTC. “I don’t know how much the Texas Workforce Commission partners with TSTC, but that would help our workforce a lot if they did,” he said.

Vernon points out that while manufacturers in the Waco area produce unique products from each other, they all have similar business operations with similar departments, including finance, manufacturing, quality control, warehousing, distribution, maintenance, marketing, and human resources.

“But so many people come in not knowing about the business structure in these plants or how these departments interact. We need to improve that,” Vernon said.

IKO in Hillsboro, Texas

Interview on Sept. 1, 2017, with Luis Diaz, plant supervisory

Hillsboro, Texas, has proved to be a challenging place to find workers for IKO, a global manufacturer of roofing tiles.

“We interviewed 300 people to find the first 30 people we hired, it was exhausting,” said Luis Diaz, plant supervisor, who will continue interviewing every potential employee for the IKO plant. The hiring process has been a strenuous part of the process of getting the new factory open in November or December of this year.

“It’s very hard to get the employees we need,” Diaz said. “Hillsboro is a pretty small city and there’s already three or four other manufacturing operations here that are employing a lot of the qualified workers.”

The IKO plant needs to be up and running later this year and manufacturing roofing shingles with production planned for 60,000 shingles a day, he said. Diaz knows that to reach that production level he needs 60 employees ready and trained. So far, he’s got 31.

The company is particularly trying to fill and train three key positions in the new plant. Those are:

- 1) Production Technicians or ‘Operators’
- 2) Maintenance Technicians
- 3) Shipping Workers

Production Technicians, also called machine operators or just operators, are workers who are working at 10 work stations with the main shingle-making machine. These workers would start at \$17 an hour and need to have some kind of experience working on the production line with a manufacturing company as well as an understanding about machine operations and programming.

“We prefer some manufacturing experience. If they had some trouble-shooting experience that would be a plus,” Diaz said.

Maintenance Technicians need to have at least two years of manufacturing line maintenance experience. The company is trying to find experience electricians and mechanics for the Maintenance Technicians jobs but finding those kinds of workers in Hillsboro who are looking to work at a new factory is proving to be a big challenge. Maintenance Technicians will start at \$28 an hour but could make more money if they earned some maintenance certifications. Diaz said that the company had hoped to lure experienced maintenance workers from the Dallas-Fort Worth and Austin areas but has not had luck so far.

Shipping Workers will be hired this fall and need to have experience driving a forklift and working in a distribution environment. These workers will start at \$17 an hour.

An ongoing challenge has been finding supervisors. The company originally used the WorkInTexas.com website to advertise for most jobs, particularly supervisor positions. But the job applicants that came through the WorkInTexas database consistently did not have the right work experience. “WorkInTexas was not good. The information was not accurate,” Diaz said. “People whose only experience was working at McDonald’s were coming through and applying to be managers.”

“WorkInTexas was not working for me. It wasted a lot of my time,” Diaz said. “So, we cut to the chase and got away from the computers and went to the real world with job fairs, the workforce staff were really helpful in setting those up.”

IKO had seven job fairs, with four in Hillsboro and three in Waco. IKO had its first job fair in mid-April at nearby Hill College. In two days Diaz and his team interviewed 150 people and found most were good candidates and many were excellent job candidates. Ironically the job fair at Hill College turned out very few students from the college. “The Waco job fairs were not productive at all,” he said.

Still, Diaz was pleased with the job fair approach to finding workers. Even the last job fair, which was in June in Hillsboro, attracted fewer than 10 job seekers but all were good job candidates. And that reinvigorated his interest in working with the Heart of Texas Workforce Board and the Workforce Solutions staff.

“The workforce personnel were wonderful. I was amazed that I didn’t have to pay them for all they did for me. The job candidates were not always the best but the workforce staff were the best, they were dedicated to helping us. They were committed to IKO. That was very impressive,” Diaz said. “Working with Bernice Gonzalez was a good experience.”

“I’m coming from Illinois and we don’t get that kind of service from the local workforce board in Illinois. I was very impressed with the workforce team here,” he said.

One need IKO still has is for soft skills or “people skills” training, Diaz said. He has not seen that any of the community colleges in or around Hillsboro have any special training programs for companies like his that want training for their employees in business operations, management and soft skills. Diaz said that he plans to hire an outside consulting firm to come and deliver on-site training to his line employees, starting with soft skills.

Construction is still going on at the new 250,000-square-foot, \$100 million IKO plant in Hillsboro.

The company expects employment at the Hillsboro plant to get to 100 employees, which should position the plant to turn out more than 100 truckloads of shingles a day for construction in Texas and nearby states. The plant is less than a two-mile drive east to Interstate 35 and will have room to expand in the future. “We’ve heard that a lot of other new companies came to town and then shut down after a few months, so a lot of people are nervous about working for a new company,” Diaz said.

Still, IKO is committed to launching this new plant in Hillsboro. IKO is a family-owned company based in Ontario, Canada. The 43-year-old Diaz has been working for IKO for 20 years. He started as a regular worker on the production line and after four years was encouraged to take some internal training classes that IKO offered to build up his communication skills. That in-house training helped move him up into management.

IKO moved away from its “people skill” trainings but now wants to bring such training back because management has seen that better communication and interaction among employees helps the production operations and fits with the corporate culture. “Soft skills are really critical. How people talk to their co-workers is critical. We want employees to express their opinion. We want a safe environment, so that requires that all employees feel free to speak up,” Diaz said.

“I would recommend job training programs that help people explain who they are and what they want to do,” Diaz said. “I saw some shortage of soft skills during the interviewing process. Some people couldn’t explain who they were, that doesn’t help me.”

“We have 31 employees and we’re training them. We still have six or seven employees who still have a hard time speaking up because of some of their previous work experiences. I hope they come around soon,” Diaz said. “Sometimes it would be better to have strong soft skills rather than have a lot of manufacturing work experience, it’s that important.”

IKO wanted to have all of its hiring completed by July. Instead Diaz will continue moving forward with hiring the second half of the employees needed as they try to get the plant up and running later this year.

L3 Platform Integration Division in Waco, Texas

Interview on Aug. 23, 2017, with Leahna Risi, PHR, human resources manager

L3 Technologies has its big aircraft maintenance operations, the L3 Platform Integration Division, in Waco and that division has an ongoing need for workers with specific skills and strong positive attitudes. The company faces the challenge of recruiting specialized workers to come to Waco and to stay.

“One thing we find with a lot of our aircraft technicians is that they leave the Waco area. They come for a year or year-and-a-half, and then they leave,” said Leahna Risi, human resources manager at L3. “Waco is not known as a big metropolis, so if they want to meet a spouse a lot of people think they have to move away or back home.”

L3 has almost 1,300 workers at its Waco facility, which does maintenance on planes for the U.S. military, federal agencies and private companies. Most of those workers are not from the Waco area. L3’s workers need to have the experience and hard skills that will pass the approval of federal auditors, as well as have the soft skills to interact with federal inspectors and military customers.

L3’s unique customers – the United States military and federal government – and unique aviation industry work requirements, create further recruiting challenges for L3 in Waco.

All L3 employees must have either federal security clearance or be eligible to obtain a security clearance. As a result, more than 80 percent of L3 workers have served in the military. The need to be able to gain a government security clearance means that most people with a felony criminal conviction, particularly for drugs or violent crimes, cannot work at L3. About 75 percent of L3 employees have a federal security clearance. Recently a young stock clerk only a year out of high school earned a security clearance.

The company’s federal maintenance contracts and other maintenance work can vary, but the company needs to be staffed with an adequate number of key positions, particularly:

- 1) Aircraft Technicians
- 2) Aircraft Painters
- 3) Stock Clerks

Aircraft technicians can range from Flight Line Mechanics, Sheet Metal Mechanics and Aircraft Mechanics. Flight Line Mechanics work on the rigging and controls of the plane. Sheet Metal Mechanics work on the plane’s structure. Aircraft Mechanics are the generalist technicians.

Ideally, L3 would like to have aircraft technicians with many years of experience and already holding an Airframe and Powerplant (A&P) certificate, which is issued by the Federal Aviation Administration (FAA). But potential

employees with that experience and certifications often need to be enticed to apply for jobs in Waco, Texas.

“About five years ago when we were trying to hire Sheet Metal Mechanics like nobody’s business, we were willing to look at auto mechanics or auto body mechanics if they have transferable skills, like banging out dents in metal or working on complex engines, and if they were willing to learn,” Risi said.

That need for aircraft technicians led L3 to work with Texas State Technical College in Waco on an aircraft maintenance training and degree program. L3 typically hires 5 to 7 students enrolled in TSTC’s Aviation Career Education or ACE program, bringing them in as working interns while still in school, then hiring them full time after graduation. The ACE program has been really effective because typically students at TSTC are from Waco and want to stay in Waco.

Because the federal government was holding off on entering new contracts, L3 temporarily froze hiring in mid-2017 and voluntarily reduced its workforce. But the company expects the federal government will need aircraft maintenance eventually and L3’s hiring will reignite.

Aircraft technicians do not have to come in with their A&P certificate. But employees with the A&P certificate are paid an extra 50 cents to a \$1.50 per hour. Aircraft technicians start at \$16 to \$18 an hour and the pay goes up from there based on experience and certifications.

Aircraft painters are another specialized job. Aircraft painters must have experience at reading technical requirements for the types of paint and composition of paint that can go on different metal aircraft parts, as well as understand the chemicals involved to get the correct colors that a customer wants, and whether a plane is a combat jet or Air Force One. Painters also must have some artistic ability when mixing and applying the paint. Painters earn \$26 to \$28 an hour.

Stock clerks are one of the relatively higher demand entry-level jobs at L3. “Stock clerks are assigned to work on specific aircraft modification programs because we have several programs utilizing the same aircraft platform, but they have to learn hundreds of parts for that specific plane,” she said.

“Stock clerks are usually the position with the most turnover. They’re usually young and suddenly they have young person issues come up in their life and they leave,” Risi said. “We do really well when we hire people who were in the military for those positions.”

“For the most part, our supervisors who are hiring stock clerks are hiring for attitude and aptitude,” Risi said. “Our supervisors are looking for anybody with any inventory control experience, which most people don’t have. So in interviews, they’re asking the applicant to explain how they organize their work.” Soft skills have become more important in the hiring process at L3. Any L3

employee can be approached by an Air Force service member or a federal auditor and be asked to explain what they are doing and why they're doing the task in that way. L3 needs employees who can remain calm, concisely explain the situation, and be helpful when questioned.

"Soft skills really matter," Risi said. "Our people are dealing with the customers and other employees every day so being able to empathize, sympathize and communicate in a way that is effective for the people they're interacting with is important for getting work done."

"Good written and oral communication skills are really important of us," Risi added. "Adaptability to change is also important because things change around here all the time, so 'going with the flowness' is a real skill we need. Reliability is what our supervisors would say they want. Show up to work on time and when you're here, do your job. That is really what we need."

L3 is trying to identify customer service skills in potential employees. "A customer orientation or customer service focus is important because anybody here can come face-to-face with a customer. Usually if they have good customer service skills, employees will work better with each other," Risi said.

L3 does not demand high educational attainments, although the company wants workers with at least a high school diploma. They do not take resumes and require anybody who is interested in a job to apply first through the L3 website (<http://L3T.com/Careers>). Risi looks at all job applications that come in. Then line supervisors interview job applicants. Those interviews include behavioral questions, such as "Tell me about a time you had to deal with a difficult person."

Supervisors are looking for job applicants who can explain concepts and demonstrate some integrity and some critical thinking, which is important because the work L3 employees do has a direct impact on the safety of American service members.

To recruit new employees, L3 has turned to setting up its own job fairs, working with regional community colleges and listing job positions on the L3 website as well as www.jsfirm.com, which is an aviation industry job board. Still, the best recruiting technique is to use employee referrals.

"If we have someone who recommends his friend and we hire the friend, then he's more likely to stay because now he has his buddy and he's less likely to leave Waco and leave us."

MarathonNorco Aerospace in Waco, Texas

Interview on Sept. 18, 2017, with Cathy Allen, Human Resources Manager

For MarathonNorco Aerospace to remain a leading maker of batteries for airplanes, it needs workers who can understand the engineering and chemical complexities of aerospace batteries and have the ability to get along with their coworkers.

“We’ve been here so long and we’re so well established we don’t have a lot of turnover,” said Cathy Allen, human resources manager at MarathonNorco Aerospace. “We had a RIF (reduction in force) a few years ago and we’ve been gradually building back up.”

MarathonNorco Aerospace has 110 total employees. While the company has limited turnover, its hourly production positions have the most frequent openings. Among those positions are:

- 1) Cell Assembly Operators
- 2) Plaque Process Operators
- 3) Electro Mechanical General Repairers

The Cell Assembly Operator, an entry-level production role in the company, uses micrometers and industrial presses. As a result, job applicants must pass a basic test of their physical fitness. Workers in this position tend to start at about \$12 an hour but after three months are eligible for a raise or promotion.

“We don’t require work experience, but if they have manufacturing work experience that would really help,” Allen said.

Plaque Process Operators have the sensitive job of combining nickel and cadmium as the fundamental elements of the battery. These workers need to be able to understand and read blueprints, as well as do a lot of math. MarathonNorco tends to hire workers with at least one year of experience in operating machines, can use computers and understand how to do an acidity or pH test. In addition, these workers need to be able to quickly and safely set up and take down industrial equipment, as well as lift 60 pounds.

The Electro Mechanical General Repairers need to have at least three years of experience working in a manufacturing facility, experience repairing lots of different kinds of machinery and troubleshooting problems for different kinds of electrical equipment. For this job, workers also need to understand basic computer programming on an industrial machine, understand electrical installation, understand how to read electrical circuitry schematics and even have experience in carpentry. While the company doesn’t have educational attainment requirements for many jobs, this role does require post-high school vocational training.

“[Texas State Technical College] experience would be great. We love to see people who have gone to TSTC,” Allen said. “Working in this environment is definitely different than working in a body shop.”

Like other Central Texas employers, MarathonNorco Aerospace also wants workers who can demonstrate soft skills. “Excellent attendance and punctuality is crucial as is good communication skills. We need people who dress professionally and are professional at work,” Allen said. “The good communication skills really are important. Most of our employees don’t deal with external customers but they are working with their coworkers. Every day they’re interacting with a lot of their other coworkers to get things done.” A worker’s communication skills and tact with coworkers is taken into account when that employee is considered for a promotion. “We like to promote from within,” Allen said.

When Allen has a job opening she posts the job online with WorkInTexas.com, NationJob.com and the Waco Tribune newspaper. She also sends a notice to the employment counselors at Fort Hood, the Veterans Administration and Workforce Solutions offices in Waco as well as the Texas Veterans Commission.

Sanderson Farms in Waco, Texas

Interview on Sept. 25, 2017, with Kelly Alejandro, Human Resources Manager

Sanderson Farms in Waco has a constant need for workers. But those workers must be able to get along with each other while also processing chickens for market.

“We have 500 people working together in the same room, so we need people who can get along with others with good communication skills and attention to detail,” said Kelly Alejandro, human resources manager.

Sanderson Farms opened its poultry plant in Waco in August 2007. Within a few years, the massive Waco plant had grown to full capacity. The Waco plant now employs 1,115 people who work two shifts and process 1.2 million birds a week.

The Sanderson Farms plant in Waco has two main positions for which constantly searches for applicants:

- 1) Line Technician
- 2) Maintenance Mechanic

Line Technicians are line workers who cut and process chickens in a room that is kept at a chilly 38 degrees. They must wear layers of clothes to stay warm.

“It sounds pretty easy, cutting with knives and scissors; but it’s not. It’s hard work. Not everybody can do it for eight hours a day in a cold room,” Alejandro said. “We process chickens. We have a lot of repetitive motion. We need people who can focus and do the work. We need people with a lot of attention to detail.”

Line workers start at \$11.85 an hour and can move up if they demonstrate the ability to focus and have the hand skills to specialize in cutting shoulders or wings. About 800 employees at the plant are line workers. Line worker positions do not require any educational diplomas, but Alejandro is looking for people with some work experience. “We prefer if they have some kind of manufacturing production experience. It helps if they understand the manufacturing production environment,” she said.

In Waco, Sanderson Farms competes for workers with two other poultry plants, which are operated by Pilgrim’s Pride and Cargill Meat Solutions. For all food processing plants, turnover is an issue. In a normal week at Sanderson Farms, Alejandro interviews 80 job applicants and hires 25.

Maintenance Mechanics are workers who maintain and repair equipment at the plant. Sanderson Farms requires that these employees have maintenance work experience.

All workers need to be able to discuss their work history. Alejandro is listening to how they discuss previous jobs to learn how well a job applicant can communicate. “You can understand who is going to work out and not,” Alejandro said.

To recruit workers, Sanderson Farms has billboards and runs radio advertisements on multiple radio stations. The company also participates in a lot of the jobs fairs put on by the Heart of Texas Workforce Board. Sanderson Farms also posts jobs with the local Workforce Solutions offices, which brings in both excellent job candidates, as well a few questionable job candidates, Alejandro noted.

“We just had some people come from Workforce and they showed up for their interview wearing pajamas. We sent them away. Some people just are not going to work out.”

Hillsboro Travel Centers of America in Hillsboro, Texas

Interview on Sept. 18, 2017, with Christopher Upton, assistant general manager

More and more truck drivers are pulling into the Hillsboro Travel Center to get their trucks serviced quickly, which means Christopher Upton is spending more with new customers and new hires.

“We need people who have a sense of urgency,” said Upton, who oversees a staff of 24 in the truck shop at the Hillsboro Travel Center. “These guys who drive the trucks need to get their trucks fixed and get out of here quick. In our business, trucks are going to be coming to us no matter what. But for these truck drivers, they’re not always going to get a load so they can only get loads and get paid if they’re out on the road and not in the shop. We need people who understand that.”

In 2016, the Hillsboro shop experienced more business than previous years, and business is up another 25% in 2017. “Our location is booming. This I-35 split area is getting busier and we’re getting busier,” Upton said. More business also makes hiring increasingly challenging.

So far this year, Upton has lost one employee and hired three. He expects to hire three more due to increased demand. He says he gets three to five job applicants for each job opening. But Upton knows from experience that he needs a minimum of six applicants per opening to find a good applicant.

The two core positions Upton hires for are:

- 1) Technician (mechanic)
- 2) Truck Service Advisor

A Technician is a trained shop mechanic. The company has eight levels of technicians starting with a Level One lube and tire technician. “The toughest job to fill is the technician,” Upton said. “It would be wonderful if everybody who applied had experience and the right education and certificates but that doesn’t happen.”

Technicians start at \$10 an hour and can earn more as they get work experience and higher levels of Automotive Service Excellence certifications in specializations such as truck electrical systems or heavy-equipment maintenance. The higher technician ranks also earn higher commissions based on their billable work. Work commissions usually amount to an extra \$2 to \$8 per hour.

The Hillsboro Travel Center tends to promote from within and Upton is an example of that. He had not touched an 18-wheel truck until a year ago when he started as a Level 1 lube and tire technician. Then he completed the in-house trainings, earned ASE certifications and was promoted. Now, he is the boss.

Truck Service Advisors are customer-facing staff who fill out work orders, enter data and handle billing. These positions also earn commissions based on work completed. “It would really help if the Truck Service Advisors had computer skills, math skills, communication skills and phone skills. They also need patience. They need to be calm. Sometimes it can be a stressful job. It can be a fast-paced job with customers getting in their face because they want to get back out on the road,” he said.

All employees need to have a high school diploma or general education diploma along with a valid driver's license as all employees end up taking a company vehicle to do a service call on the side of the highway.

As a result, Hillsboro Travel Center also needs workers who can follow company procedures. For instance, one of the first steps that must be completed when out on a service call is to place orange warning cones 150 feet behind the truck, which increases safety for the workers and the customers.

The company also needs workers who can follow rules on cleaning and maintaining equipment. "Cleaning habits are mandatory and important. For example, a jack stand is going to get oil and grease on it, but we want it cleaned after you use it. Now you can quickly power wash it and get most of the oil off of it, but if you wiped it down then it's really going to be clean," Upton said. "When customers pull in here we don't want them to see a dirty, greasy, junky shop. There's plenty of junky shops all across America. Nobody wants to drive into a junky shop. We want a clean, professional looking shop. They're going to trust us more with their work if they see a clean shop."

The Hillsboro Travel Center has done most of its worker recruiting through Texas State Technical College and other regional community colleges with established diesel mechanic schools. The Hillsboro Travel Center is part of the Ohio-based TravelCenters of America chain of 244 truck service centers across North America. Job applicants must apply online through the www.myTAjob.com website, which funnels job applications to Upton in Hillsboro. TravelCenters of America has also advertised jobs with Monster.com, which is driving a few more job applicants to the company.

Upton is looking for even more job applicants for Hillsboro. "We need people to understand that our advancement program really works, I'm proof of that," he said.

City of Waco Water Utilities in Waco, Texas

Interview on Sept. 25, 2017, with Charlotte Doran, Utility Safety and Resources Management Group Supervisor

The City of Waco's Water Utilities departments is frequently looking for workers and filtering applicants based on hard skills and soft skills.

"It's all about skills and attitude. We hire for character. We try to figure out a job applicant's work ethic and if they can handle working here," said Charlotte Doran, the utility safety and resource management group supervisor who is involved in much the city's Water Utilities departments. "Many people will end

the interview themselves when they learn more about the job and get up and say, ‘thank you’ and leave the interview.”

A key issue is commitment. Most of the 197 employees of the Water Utilities departments have to be on call and able to work at any hour of any day. Waco cannot run without Water Utilities employees.

The Water Utilities departments have an almost continual need for workers in four key areas.

1. Utilities Customer Service Representatives
2. Water Treatment Plant Operators and Wastewater Treatment Plant Operators
3. Operations field workers
4. Utilities Project Administrators

The Water Utilities departments run the call center for all utilities with the city. These positions are call center representatives. The city requires that job applicants have a high school diploma or general equivalency diploma as well as at least two years of work experience doing customer service or bookkeeping. Call center jobs start at about \$15 an hour.

The city does extensive testing for these call center jobs. Job applicants are tested on 10-key machines, telephone etiquette, customer service behaviors. Job applicants are also given a writing test and a separate test to create a spreadsheet in Microsoft Excel. “We’re testing for comprehension of information and attention to detail,” Doran said. “We want to find out if they can write a complete sentence. Can they form a cohesive thought? Is their handwriting neat?”

Job applicants are also given math tests to add numbers, divide numbers and calculate averages – and there are trick questions to determine if the applicant can really follow directions.

The Water Treatment Plant Operators and Wastewater Treatment Plant Operators start at about \$15.50 an hour. Job applicants for these jobs must also have a high school diploma or GED along with one year of experience, preferably in a water treatment plant environment. The city would prefer if job applicants had a commercial driver’s license with a tanker endorsement along with a basic Class D water license from the Texas Commission on Environmental Quality (TCEQ).

“A Class D water licenses doesn’t require work experience in the water field so it doesn’t do us much good but it really shows initiative,” Doran said.

All Water Treatment Plant Operators and Wastewater Treatment Plant Operators must complete the testing and earn the more valuable Class C water license from TCEQ within 30 months of starting the job with the city. “These

workers literally treat the water. They take water samples constantly. They work with electronic systems. They do pH testing. It can be a physical job,” she said.

Operations workers are constantly out in the community fixing water leaks, fixing sewer leaks, installing water hydrants, and working with construction crews. These positions tend to start at about \$15.50 an hour.

The three jobs of operations workers are:

- a. Utilities Maintenance Worker
- b. Distribution/Collection Operations Worker
- c. Distribution/Collection Crew Leader

A commercial driver’s license is required for each of these positions. If a job applicant does not have a CDL license with a tanker designation then he has 90 days to get it. Employees in these positions are also using vacuum trucks to clear water and sewer lines, install water valves, and interact with construction workers.

Workers in these roles must also test for and earn their Class C water license or Class 2 wastewater license from TCEQ within 30 months of starting at the job.

The Utilities Project Administrator jobs are some of the hardest for the city to fill. These jobs tend to start at about \$60,000 and go up to about \$110,000 a year.

These jobs require a Bachelor’s degree in engineering or accounting along with four years of work experience in either design engineering or construction project management. A professional engineering license is desired but not required for applicants. “We’re recruiting for civil engineers and we get a lot of prospects for the jobs but it’s tough to land a prospect. It’s tough to compete with the private sector,” Doran said.

This job involves being able to read blueprints and planning documents along with handle contracts and requests for bids for construction work.

For most jobs in Water Utilities, the city posts jobs on its website. When the city isn’t getting enough applicants for a good pool of prospects, which commonly happens, Doran will also take out help wanted advertisements in the Texas Water Utilities Association magazine and website.

The city does background checks on all job applicants and calls all personal references of applicants to move the application process forward before the best candidates go to another employer. “We’re trying to keep the city running,” she said.

Constructing Career Progressions for Workforce Solutions Heart of Texas

The project goal for the Workforce Solutions Heart of Texas career progression initiative was to construct career lattices that encompassed all thirty-nine (39) of the previously identified and approved HOT LWDA Target Occupations. Because the methodology for developing a target occupations list by definition excludes entry-level occupations for which little or no training is required, none of the HOT Target Occupations qualified as Anchor occupations from which to construct a career progression lattice. That said, each of the 39 Target Occupations fits within one or more career progression lattice. The initial challenge was to determine which occupations reasonably serve as entry-level or Anchor occupations for each lattice that will subsequently include all 39 Target Occupations.

Data Development and Identification of Anchor Occupations

In an ideal scenario, each entry level or Anchor occupation would be determined through an industry analysis. In this case, the regional industry analysis had already been performed. A list of Target Occupations had been identified based on alternate criteria required by the Texas Workforce Commission, as modified and interpreted by the staff of the Heart of Texas workforce board. Since the Target Occupation list is used to direct local 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 were 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 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) Heart of Texas Target Occupations fit reasonably within one or more lattice.

The initial challenge was to determine which occupations could reasonably serve as entry-level or Anchor occupations for a career progression lattice that will subsequently include all 39 Target Occupations. To accomplish this task, a series of occupational and skill-based data files were developed for cross-referencing Target Occupations and myriad potential Anchor occupations.

⁵ 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.

⁶ 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.

⁷ Additional occupational title-to-title skill transferability analysis was performed using the AutoCoder utility developed by RM Wilson Consulting Inc.

Building the Lattice Master Database

The first step in the methodology was the construction of customized master data files that include detailed work activity⁵ (DWA) profiles for each occupation, plus regional labor market data for the Heart of Texas region.

To construct the source data files, a master database was built that includes all Standard Occupational Classification (SOC) occupations with several meta-data descriptors. A DWA profile was constructed for each SOC code in the occupational universe based on the Texas DWA library, as refined by *SkillsEngine*, a division of the Center for Employability Outcomes (C4EO) at Texas State Technical College. *SkillsEngine*⁶ provides advanced skill curation and translation expertise that can be used to transform unstructured text into rich occupational metadata.

The DWA skill profile, consisting of the top 100 DWAs per SOC for each of 850 occupations, was stack ranked based on a SOC-centric weighting schema driven by a combination of AutoCoder⁷ thread scores (strength of match) from the linked occupations and the annual average job openings due to growth estimate from Chmura Economics. Because the objective of the weighting schema is to prioritize and weight skills based on 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 39 Target Occupations and all 850 occupations in the SOC occupational universe. This process was accomplished using detailed work activities (DWA) 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 a thousand plus skill statements more 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 showed the number and percent of DWA skill statements that were common between each of the 39 Target Occupations and every other occupation in the SOC universe. The resulting file contained almost 32 thousand records. Clearly, some occupations have little to no skill commonality with any Target Occupation. 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 5,400 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-partition 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 2015). The CER education level was substituted for the default BLS typical education assignment that was used in the initial HOT occupational targeting exercise⁸.

There are several examples of differences between the BLS education rating and the CER that were 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 and 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, Associate’s degree and Bachelor’s degree meets the WIOA definition of occupations with a Recognized Postsecondary Credential⁹.

Similar situations exist for the occupations of Industrial Machinery Mechanics, Welders, Cutters & Brazers, Plumbers and Pipefitters, Police and Sheriffs Patrol Officers, and Machinists - all from the HOT Targeted Occupations list. These occupations clearly require some post high school training and thus do not represent true entry-level or Anchor occupations for career progression purposes.

Also included in the master data base were a variety of wage and employment projections variables. For this project, we extracted the 2016 median occupational wages from both the Texas Workforce Commission/Labor Market and Career Information Department and from Chmura Economics for the Heart of Texas LWDA and Texas statewide. We also pulled 2017-2027 long-term

⁸ HOT Board staff used the BLS typical education rating during the formal target occupations process, as required by TWC. Because this project used the CER, a modified version of the BLS education rating system, some occupations will have different education ratings depicted on a lattice than assigned by Board staff.

⁹ WIOA Section 3. Definitions (52) defines ‘recognized postsecondary 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.

Heart of Texas Anchor Occupations with Labor Market Information				
	Anchor SOC code	Anchor Occupation Title	Anchor Occupation CER	Median Wage 2016
		Total, All HOT Occupations		\$39,500
		Total, All Anchor Occupations (weighted wages)		\$23,075
1	45-2091	Agricultural Equipment Operators	No formal educational credential	\$27,200
2	39-9011	Childcare Workers	High school diploma or equivalent	\$18,300
3	47-2061	Construction Laborers	No formal educational credential	\$26,400
4	53-3031	Driver/Sales Workers	High school diploma or equivalent	\$19,400
5	47-3013	Electricians Helper	High school diploma or equivalent	\$33,700
6	51-3099	Food Processing Workers, All Other	No formal educational credential	\$23,800
7	51-9022	Grinding and Polishing Workers, Hand	High school diploma or equivalent	\$28,300
8	31-1011	Home Health Aides	High school diploma or equivalent	\$18,700
9	43-4081	Hotel, Motel, and Resort Desk Clerks	High school diploma or equivalent	\$19,600
10	49-9099	Installation, Maintenance, and Repair Workers, All Other	High school diploma or equivalent	\$27,900
11	33-9092	Lifeguards, Ski Patrol, and Other Recreational Protective Service	No formal educational credential	\$17,900
12	49-9071	Maintenance and Repair Workers, General	High school diploma or equivalent	\$30,800
13	43-9199	Office and Administrative Support Workers, All Other	Some College, No Degree	\$37,200
14	49-3053	Outdoor Power Equipment and Other Small Engine Mechanics	High school diploma or equivalent	\$30,300
15	39-9021	Personal Care Aides	High school diploma or equivalent	\$18,100
16	51-9198	Production Worker Helper	No formal educational credential	\$24,200
17	31-1013	Psychiatric Aides	High school diploma or equivalent	\$25,900
18	43-4171	Receptionists and Information Clerks	High school diploma or equivalent	\$25,700
19	33-9032	Security Guards	High school diploma or equivalent	\$22,200
20	35-1012	Supervisors, Food Preparation Workers	High school diploma or equivalent	\$28,200
21	25-9041	Teacher Assistants	Some College, No Degree	\$21,200
22	51-2092	Team Assemblers	High school diploma or equivalent	\$24,400
23	31-9096	Veterinary Assistants and Laboratory Animal Caretakers	High school diploma or equivalent	\$22,500

occupational projections from Chmura Economics and 2014-2024 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. The TWC/LMCI projections covered only 406 occupations and the wage data are provided for only 443 occupations.

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 data, providing more occupational detail crucial to the progressions methodology. Chmura provides occupational projections and wage data for 819 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 effort¹⁰.

¹⁰ The TWC/LMCI 2014-2024 projections, combined with data from the 2016 OES wage survey, include total coverage of 489 occupations. Projections data are provided for 406 occupations and wage data are available for 443 occupations. There are 36 occupations that have wage data but no projections, and 41 occupations that have projections but no wages. Roughly 8.5% of total base year employment is not included in the detailed projections data. The lack of universal occupational coverage and the inconsistent availability of both wage and projections data made the TWC/LMCI projections less than optimal to execute the progressions methodology.

Selecting Anchor Occupations

To identify potential Anchor occupations, occupations were selected that had; 1) relatively close DWA skills match, 2) similar or lower education requirements, and 3) a median annual wage less than the Target Occupation. The first cut of this process resulted in 248 potential Anchor occupations that covered all 39 Target Occupations. To further winnow the list, 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, and to verify that potential Anchor occupations had a threshold of employment in the region. These final criteria resulted in the selection of 23 Anchor occupations¹¹.

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 23 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 SOC's based on the strength of skill alignment, e.g. the degree to which the top 100 stack-ranked DWAs for the Anchor occupation aligned with the stack ranked skill profiles of all the other 850¹² 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 match¹³. Alignment scores of 40 and above (normalized on a scale of 100) 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.

¹¹ Methodologically, there is no connection between occupations identified as entry-level in the HOT WIOA Board plan and those selected as Anchor occupations for purposes of career progressions. Interestingly, five WIOA entry-level occupations are on both lists. Occupations identified as entry-level on the Board plan and which were also selected as Anchor occupations were: Construction Laborers, Driver/Sales Worker, First-line Supervisor Food Preparation and Serving Workers, Personal Care Aides, and Team Assemblers.

¹² DWA skill profiles are available for 850 SOC occupations. Chmura Economics publishes requisite projections and wage data for 819 occupations for the Heart of Texas region, and so the universe of occupations for this analysis is 819 occupations.

¹³ Strength of match scores are not shown on the lattice maps because with each tier of the progression the strength of match statistics are no longer normalized and thus can be difficult to explain.

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 4 or 'Apex' occupations. Driver/Sales Worker has the largest spread of \$80,266 between Anchor and Apex or 413%. This large spread is a function of both a very low entry level wage and a very high Apex average occupational wage driven by highly paid Sales Managers. Occupations such as Electricians Helper and Outdoor Power Equipment Mechanic have entry-level wages over \$30,000 which reduces the spread. 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 120 percent growth, with an average of over 212 percent. From this perspective, the lattices clearly show career opportunity and potential earnings advancement.

For Tier II occupations, a cumulative DWA profile was created that was an composite of the DWAs from all five Tier I occupations. 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 opportunities. Tier II occupations were selected based on closest education level, the highest possible skill strength 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 100 DWAs 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 and re-ranked based on previous occupational options. This extra processing step is done to acknowledge the fact that at each tier a worker is picking up additional skills from prior work experience, thereby building their skill set – a process which should be acknowledged as they compete for 'better' jobs.

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 maps 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 postsecondary degree, license or certification, or another credential.

Average Wage by Tier for Heart of Texas Career Progression Lattices							
	Anchor Occupation Lattice	Anchor Wage	Tier 1 AVG Wage	Tier 2 AVG Wage	Tier 3 AVG Wage	Tier 4 AVG Wage	Highest Paying
1	Agriculture Equipment Operator	\$27,200	\$31,080	\$36,720	\$50,933	\$72,500	\$93,000
2	Childcare Worker	\$18,300	\$22,800	\$37,860	\$65,166	\$93,100	\$109,600
3	Construction Laborers	\$26,400	\$32,680	\$43,340	\$53,300	\$65,066	\$74,400
4	Driver/Sales Worker	\$19,400	\$32,800	\$47,840	\$59,133	\$99,666	\$115,800
5	Electricians Helper	\$33,700	\$37,420	\$50,200	\$55,933	\$74,033	\$86,000
6	Food Processing Worker	\$23,800	\$30,500	\$35,560	\$56,700	\$72,766	\$81,600
7	Grinding, Polishing Workers, Hand	\$28,300	\$33,380	\$39,920	\$51,100	\$79,000	\$93,000
8	Home Health Aide	\$18,700	\$29,200	\$44,620	\$60,500	\$83,700	\$93,000
9	Hotel Desk Clerk	\$19,600	\$29,640	\$39,720	\$49,200	\$66,933	\$78,700
10	Installation, Maintenance and Repair Worker	\$27,900	\$32,900	\$39,180	\$53,733	\$87,133	\$93,000
11	Lifeguards & Other Recreational Protective Service	\$17,900	\$26,740	\$36,900	\$51,066	\$65,366	\$82,000
12	Maintenance and Repair Worker, General	\$30,800	\$34,940	\$45,120	\$59,200	\$82,433	\$90,500
13	Office and Administrative Support Worker	\$37,200	\$42,520	\$49,220	\$56,133	\$82,266	\$95,600
14	Outdoor Power Equipment Mechanic	\$30,300	\$36,780	\$46,120	\$57,466	\$81,700	\$93,000
15	Personal Care Aides	\$18,100	\$23,800	\$42,080	\$54,566	\$77,100	\$93,700
16	Production Worker Helper	\$24,200	\$30,480	\$37,800	\$48,800	\$64,666	\$86,100
17	Psychiatric Aide	\$25,900	\$31,080	\$43,660	\$63,000	\$77,500	\$93,000
18	Receptionist and Information Clerk	\$25,700	\$30,180	\$38,520	\$50,933	\$75,000	\$83,800
19	Security Guard	\$22,200	\$32,240	\$43,180	\$56,333	\$72,833	\$82,000
20	Supervisor, Food Preparation Workers	\$28,200	\$34,828	\$45,680	\$59,633	\$86,033	\$95,600
21	Teacher Assistant	\$21,200	\$30,160	\$43,800	\$49,733	\$72,600	\$86,900
22	Team Assemblers	\$24,400	\$28,660	\$36,700	\$51,466	\$80,900	\$93,000
23	Veterinary Assistant and Lab Animal Caretaker	\$22,500	\$27,720	\$37,560	\$48,866	\$75,033	\$93,000
	Tier Averages	\$24,865	\$31,414	\$41,796	\$54,908	\$77,710	\$90,709

Interpreting the Career Progression Lattice

As the Heart of Texas employer interviews demonstrate, 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 ‘soft’ 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 region, and the general demeanor, competence and attitude of the applicant, often referred to as ‘soft skills’ or ‘workplace essentials’.

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 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.

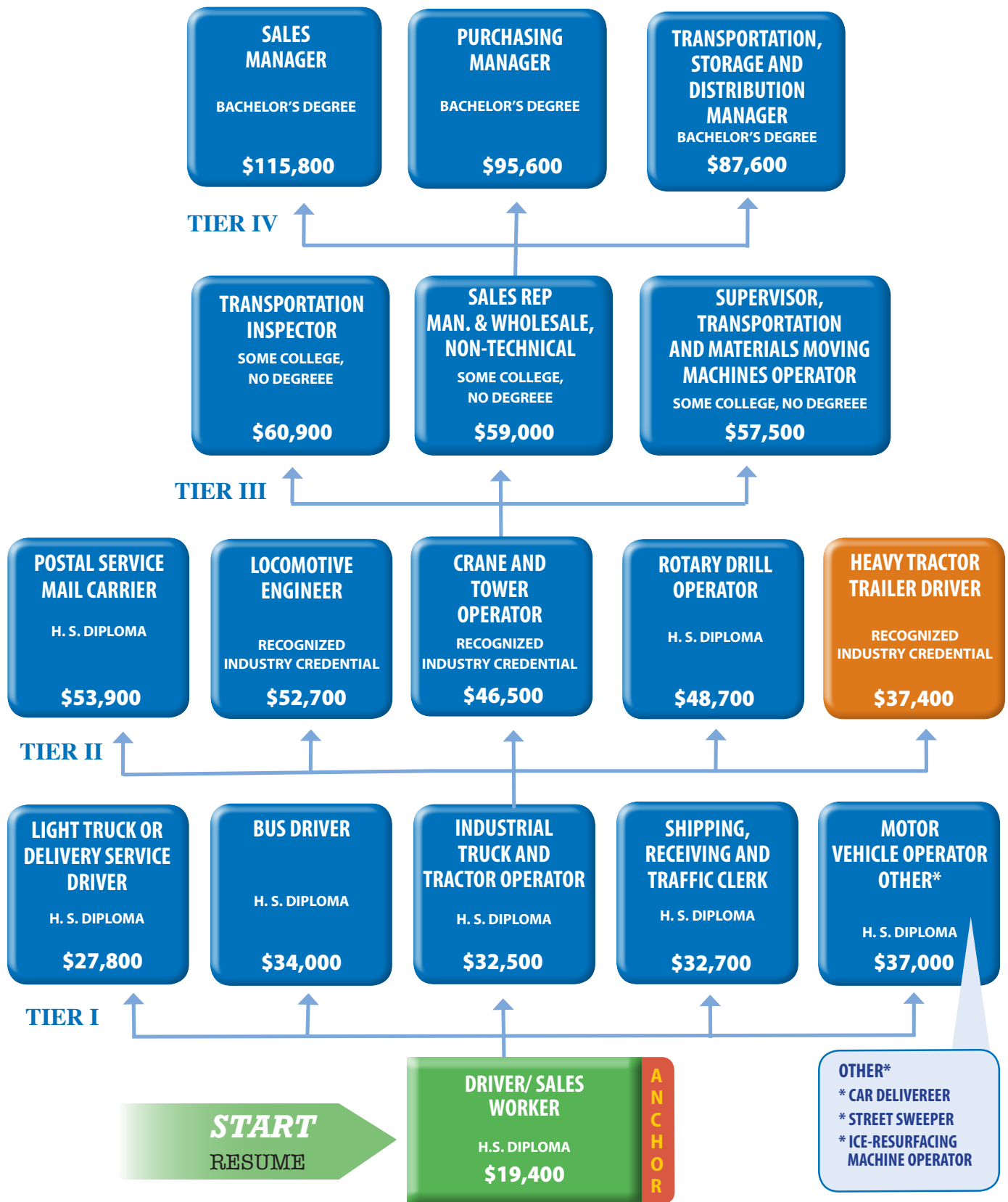
It is important to note however, that it is always possible to have a high technical skill match and, given the other types of qualifications noted above, still not be able to secure a job in the target occupation. On the flip side, strong ‘workplace essential’ skills could overcome a dearth of technical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

Navigating a Skill-based Career Progression Lattice

Everybody starts 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. The career progression in this industry 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 personally defined) 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 productive 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 Driver/Sales Workers, if a person starts as a Driver/Sales 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 Driver/Sales Worker I to Driver/Sales Worker II move is always a possibility; although not necessarily represented on the lattice diagram.

If a worker chooses to take her skills as a Driver/Sales Worker and wants to 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 Driver/Sales 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 Driver/Sales Worker career lattice begins to answer these questions.

Using a variety of DWA processing techniques, a DWA skill profile was generated for a Driver/Sales Worker. Similar DWA profiles were also created for each of 819 SOC based occupations. Based on a strength of match scoring method, five SOCs that had high strength of match scores were identified; 1) Light Truck or Delivery Drivers, 2) Bus Drivers, 3) Industrial Truck and Tractor Operators, 4) Shipping, Receiving and Traffic Clerk, and 5) Motor Vehicle Operators, Other. 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 Driver/Sales Worker in the Heart of Texas region is \$19,400. 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 Motor Vehicle Operator, Other is the highest paying of the five options, but the skill profile is less well-defined and ultimately a lesser match¹⁶. The Light Truck or Delivery Driver has the strongest match score, indicating that the subject will likely require fewer additional skills to be qualified for job openings. All five Tier 1 occupations pay well 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 (highest skill match) would be to go for a Light Truck or Delivery Driver job because it offers a pay increase to \$27,800 per year (a 42.3 percent increase) and there is likely less education or training that must occur. Depending on labor market demand, any of the

¹⁶ The lattice shows some sample payroll titles such as Street Sweeper and Ice Resurfacing Machine Operator that typically fall under this 'Other' categorization, as identified by the federal ONET initiative. They are thus national in scope. There are likely other local examples that are more appropriate to employers in the regional economy that can be unearthed through direct employer contacts. 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.

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. And onward goes the career progression process.

Let's say, for example, the worker chose Industrial Truck and Tractor Operator. She might look at the specific DWA work activities required of that job and determine if she has the ability to perform those activities 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 Driver/Sales Worker and new-found understanding of the Industrial Truck and Tractor Operator occupation, 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 Industrial Truck and Tractor Operator 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) Postal Service Mail Carrier, 2) Locomotive Engineer, 3) Crane and Tower Operator, 4) Rotary Drill Operator, and 5) Heavy Tractor Trailer Truck Driver.

The highest match among Tier II occupations would be Heavy Tractor Trailer Truck Driver. This occupation is also found on the Workforce Solutions Heart of Texas Target Occupations list, which indicates that the Board has documented significant regional job opportunity in the occupation. On the lattice diagrams, HOT Target Occupations are highlighted in orange.

In this case, the highest paying option is to get a job as a Postal Service Mail Carrier which offers high pay and good job security. It is also quite competitive and not growing quickly in the region nor nationally. All the other Tier II occupations except Rotary Drill Operator require some form of Recognized Industry Credential. Demand for Rotary Drill Operators however tends to be cyclical with the oil and gas sector, and generally requires work experience. 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 Class A Commercial Driver's License. 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.

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 and social service occupations (Home Health Aide, Community Health Workers, Health Care Social Workers) or direct care medical occupations such as Licensed Vocational Nurse, Occupational Therapist Assistant and Occupational Therapist. There is also an option to move into a supervisory role such as Social and Community Service Managers or Funeral Directors – an occupational connection that might not seem intuitive. Moreover, each occupation on the lattice represents a new potential Anchor occupation for another 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 a consideration but not the primary driver for occupational selection. In the Driver/Sales Worker career lattice for example, Tier II occupation Locomotive Engineer has relatively few projected job openings, but it is critical to the growing railroad transportation sector and had high transferable skill alignment.

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 Driver/Sales Worker, given the various Tier II options let’s assume the worker chooses the Heavy Tractor Trailer Truck Driver option. This decision could be based on the fact that the HOT Board can fund vocational training for this occupation since it falls on the Target Occupation list. It could also represent other personal values not included in the career progression lattice e.g. work environment, working conditions and job characteristics, but which can and should be considered within the scope of a career plan.

For example, the Rotary Drill Operator option might meet job demand and pay requirements, but it can require long hours away from home, often under dangerous or taxing physical conditions, and work activities that might not match the worker’s temperament or interests. 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 Driver/Sales Workers provides three Tier III options; 1) Transportation Inspectors, 2) Non-technical Sales Representative, and 3) Supervisor, Transportation and Materials Moving Machine Operators. This Driver/Sales Worker lattice includes a track for the ‘sales’ skills likely acquired in the Anchor or Tier I occupations. If the worker prefers the transportation or driving aspects of their Anchor occupation, these options 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 Driver/Sales Worker career lattice, all Tier III occupations typically require no more than ‘Some college, No degree’ and related work experience. However, given the lack of a formal education requirement or credential, the potential earnings gain between Tier II and Tier III occupations is less pronounced than on other lattices.

Assume our worker continues her journey as a supervisor, opting to pursue jobs as a Supervisor, Transportation and Materials Moving Machine Operators. Her resume and skill set should reflect her capabilities to execute the work activities associated with jobs in this occupation. In the Heart of Texas, the median wage for persons working in this occupation is roughly \$57,500; which is a comparatively good salary for the regional cost of living.

Her next move on the lattice might be a bigger challenge. All Tier IV occupations on the lattice typically require a Bachelor’s degree to be competitive for available jobs. 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 Transportation, Storage and Distribution Manager, the potential earnings gain of over \$30,000 per year could justify the added time and expense of getting the degree.

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. Groundbreaking original work from the Texas Workforce Commission and extensive enhancements from TSTC/C4EO 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 numbers 819 occupations. In the Heart of Texas workforce board region, Chmura Economics estimates a total employment of 157,263 in the first quarter 2017. Based on total employment, 18.3 percent of all workers are concentrated in the top 10 occupations. The top 50 largest occupations in the region cover almost 47 percent of total employment. Similarly, the top 100 largest occupations cover 60.8 percent of total employment. Eighty percent of all employment is found in the top 171 occupations. To describe this phenomena in another way, over 80 percent of the region's employment can be found in just over 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 even in statewide Texas, 25 percent of all projected job openings are concentrated under just 10 occupational titles, 38 occupations are responsible for 50 percent of all 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.

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.

¹⁸ Although these dimensions of management are not unique, these specific categories are adapted from *Triggers: Creating Behavior That Lasts*, Marshall Goldsmith, Crown Publishing, 2015

¹⁹ For Tier 3 and Tier 4 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.

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 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 Delegating¹⁸. 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. The weak link for career progression analysis is the transition for front line technical workers crossing over for the first time into a management domain. For this project, managerial and supervisory occupations were sometimes inserted onto a lattice through manual intervention, as appropriate¹⁹. TSTC's C4EO/SkillsEngine is actively pursuing the addition of a managerial domain for all DWA skill statements to potentially alleviate this issue.

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, with each higher level representing additional duties and responsibilities, greater technical expertise, 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 listed²⁰.

The challenge of occupational mobility between Anchor occupations and a Target Occupation is not the same for every person or every 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, a skill gap analysis was performed between each HOT Target Occupation and a respective Anchor occupation. 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 Maintenance and Repair Worker, General and Heating, A.C. & Refrigeration Mechanic. The next easiest transition is between a Home Health Aide and a Nursing Assistant. The two most challenging Tier I transitions are between Hotel and Motel Desk Clerk and Medical Secretary and Medical Records and Health & Information Technicians, respectively. It can be argued that pairs with high non-match scores should not be connected in the first place and alternate Anchor occupations identified. In the case of Hotel and Motel Desk Clerk, the absence of medical vocabulary skills appears to be a significant barrier, despite many other common work activities. 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 Heart of Texas regional employers the importance of 'soft' skills such as communication, teamwork and initiative were frequently repeated. For many employers, the ideal worker is one with an appropriate formal academic background, work experience, technical skills, workplace essential skills and perhaps 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.

²⁰ 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.

"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

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 workers²¹. 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, although everyone starts somewhere, building a highly successful and rewarding career is never out of reach.

²¹ 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.

Selecting Employer Interviews

The Workforce Solutions Heart of Texas business services staff provided employer contacts and introductions for most of the interviews conducted in the course of this project. Additional conversation and contacts were provided by the TSTC Director of Corporate Outreach. This eliminated cold calling employers and provided persons that had already shown an interest in the Heart of Texas workforce development system. Because the information gleaned from the personal interviews adds such valued texture to the conversation on worker preparation, among the recommendations for future work is the conduct of additional employer interviews. This should include conversations with businesses that have previously played minor or non-existent roles in the regional workforce system.

But what if one doesn't already have access to businesses willing to participate in an interview? Or, what if all existing contacts represent businesses that commonly interact with the workforce system but which are not particularly representative of recent hiring activity? In these scenarios, there must be an approach to identifying businesses that have significant economic relevance in the region.

One way to do this is to simply select employers with high visibility in the region; identified as being active with the local chamber of commerce, economic development corporation, or found frequently in local media reporting. It could be more extensive conversations with Board Business Services Representatives (BSR), who routinely have contact with area employers. However, for our purposes we return to the analysis of regional labor market data.

Typically, in linear fashion, an industrial targeting analysis would reveal a subset of local industries that are prominent in the region based on total employment, historical growth over the past several years, and which have positive growth outlooks. A list of business entities comprising each growth industry can be developed.

In this scenario, the Heart of Texas workforce development board had already identified a list of Target Occupations. Thus, the process for identifying potential employer interviews simply works in reverse. The first step is to look at the occupational staffing pattern to identify which industries are typical employers of the various Target Occupations. For brevity purposes, generally the top five industries in which the occupation is a significant part of their staffing pattern will suffice. A sample chart is included below that shows several HOT Target

SAMPLE - Industry Staffing Patterns for Heart of Texas Target Occupations

SOC Code	Heart of Texas Target SOC Occupational Title	NAICS Code	NAICS Industry Title	Percent of Occupational Employment in Industry (2014)
15-1151	Computer User Support Specialists	5415	Computer Systems Design Services	15.7%
15-1151	Computer User Support Specialists	6111	Elementary and Secondary Schools	11.6%
15-1151	Computer User Support Specialists	5182	Data Processing and Related Services	5.2%
15-1151	Computer User Support Specialists	5613	Employment Services	4.9%
15-1151	Computer User Support Specialists	6113	Colleges and Universities	4.5%
17-3023	Electrical & Electronic Engineering Techs	3344	Semiconductor & Electronic Components	29.5%
17-3023	Electrical & Electronic Engineering Techs	5413	Architectural and Engineering Services	18.1%
17-3023	Electrical & Electronic Engineering Techs	2211	Power Generation and Supply	5.0%
17-3023	Electrical & Electronic Engineering Techs	3341	Computers and Peripheral Equipment	4.9%
17-3023	Electrical & Electronic Engineering Techs	3345	Electronic Instrument Manufacturing	3.4%
29-1141	Registered Nurses	6221	General Medical and Surgical Hospitals	56.6%
29-1141	Registered Nurses	6216	Home Health Care Services	9.2%
29-1141	Registered Nurses	6211	Offices of Physicians	6.4%
29-1141	Registered Nurses	6223	Other Hospitals	3.6%
29-1141	Registered Nurses	9991	Federal Government, ex. Postal Service	3.2%
43-4051	Customer Service Representatives	5614	Business Support Services	11.8%
43-4051	Customer Service Representatives	4451	Grocery Stores	7.3%
43-4051	Customer Service Representatives	5221	Depository Credit Intermediation	5.3%
43-4051	Customer Service Representatives	5242	Insurance Agencies and Brokerages	4.8%
43-4051	Customer Service Representatives	5613	Employment Services	4.8%

Occupations and the percentage of occupational employment each industry is most likely to have.

From this list of industries most likely to employ the Target Occupations, one can conduct a labor market analysis. Such an analysis examines which industries have recently added jobs, are projected to add the most jobs, or have high location quotients²² (LQ) to see if those industries have a comparative advantage in the region. Industries that typically employ several of the Target Occupations, those which have experienced recent growth, and those with an LQ above 1.00 are industries from which potential employer contacts can be drawn.

For the Heart of Texas, a cursory analysis of this sort suggests that additional contacts might be made with employers the following industries: Support Activities for Mining (NAICS 2131), Water, Sewage Systems (mostly public sector municipal entities) (NAICS 2213), Utility System Construction (NAICS 2371), Aerospace Products & Parts Manufacturing (NAICS 3364), Machinery, Equipment & Supplies, Wholesalers (NAICS 4238), Home Health Services (NAICS 6216), Nursing Care Facilities (NAICS 6231), and Automotive Dealers (NAICS 4411).

²² A location quotient (LQ) is both a technique and an indicator for gauging the relative concentration or specialization of one or more industries, industry sectors or industry clusters in a region. It is calculated as a ratio of an area's employment in a specific industry, cluster or sector compared to a larger, presumably self-sufficient geography (e.g. Texas or the United States) in the same industry, cluster, or sector. A major objective for calculating Location Quotients is to identify those industries that constitute the region's economic base and export sector.

Career Progression Lattices

for HOT Target Occupations Checklist

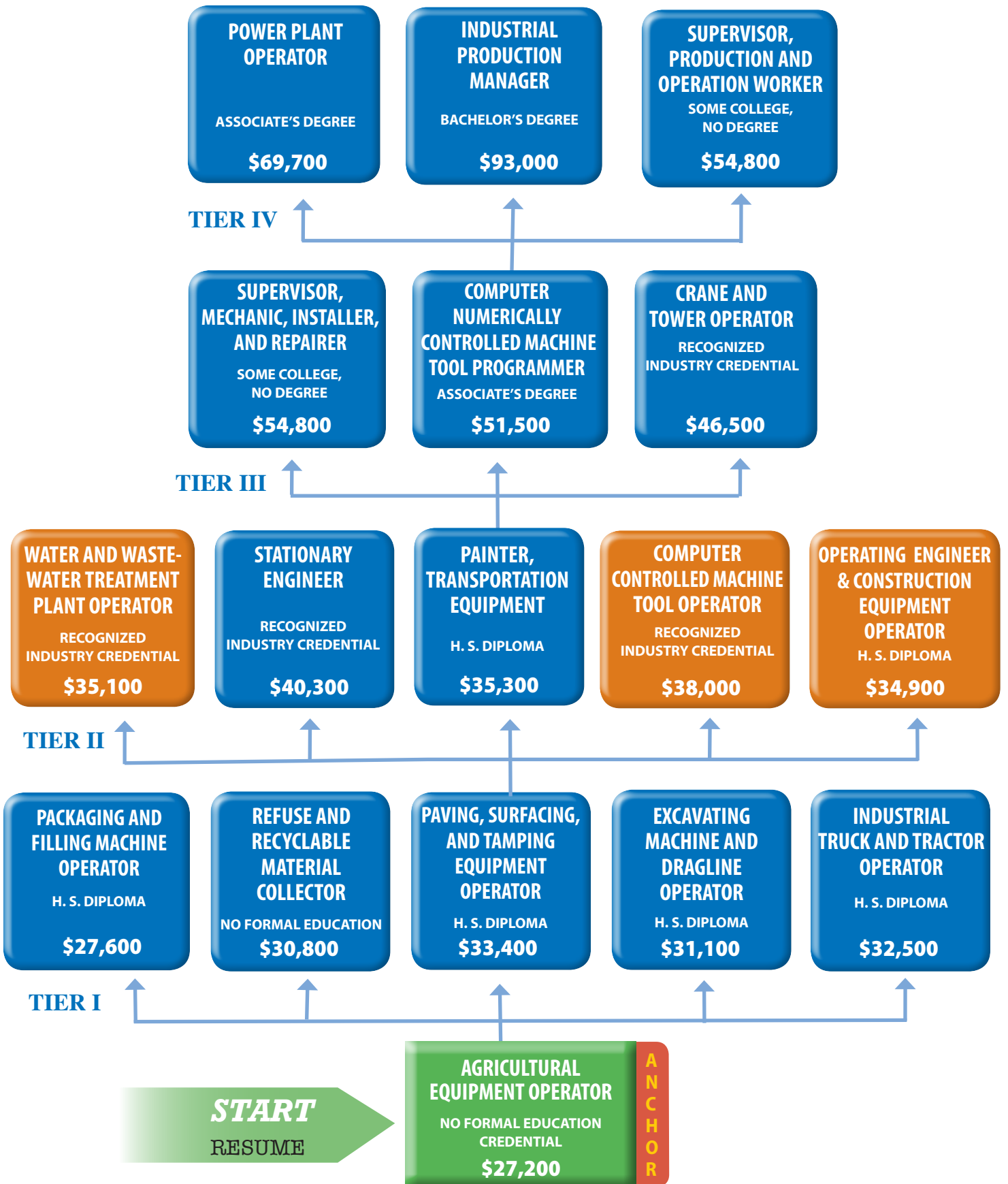
Target Occupation Job Title	Anchor Occupation/Lattice
	TARGET OCCUPATION APPEARS ON: ■ TIER 1 ■ TIER 2 ■ TIER 3 ■ TIER 4
Agricultural & Food Science Technicians	Food Processing Worker
Aircraft Mechanics and Service Technicians	Electricians Helper, Maintenance and Repair Worker, General, Outdoor Power Equipment Mechanic
Aircraft Structure, Surfaces, Systems Assemblers	Construction Laborers, Grinding, Polishing Workers, Hand, Production Worker Helpers
Auto Body & Related Repairers	Grinding, Polishing Workers, Hand
Auto Service Technicians & Mechanics	Outdoor Power Equipment Mechanic
Avionics Technicians	Electricians Helper, Grinding, Polishing Workers, Hand
Bus & Truck Mechanics & Diesel Engine Specialists	Outdoor Power Equipment Mechanic
Computer User Support Specialists	Office and Administrative Support Worker
Computer-Controlled Machine Tool Operators	Agriculture Equipment Operator, Grinding, Polishing Workers, Hand, Production Worker Helper
Customer Service Representatives	Receptionist and Information Clerk
Dental Assistants	Home Health Aide, Psychiatric Aide, Veterinary Assistant and Lab Animal Caretaker
Electric Power-Line Installers and Repairers	Installation, Maintenance and Repair Worker
Electrical & Electronics Engineering Technicians	Electricians Helper

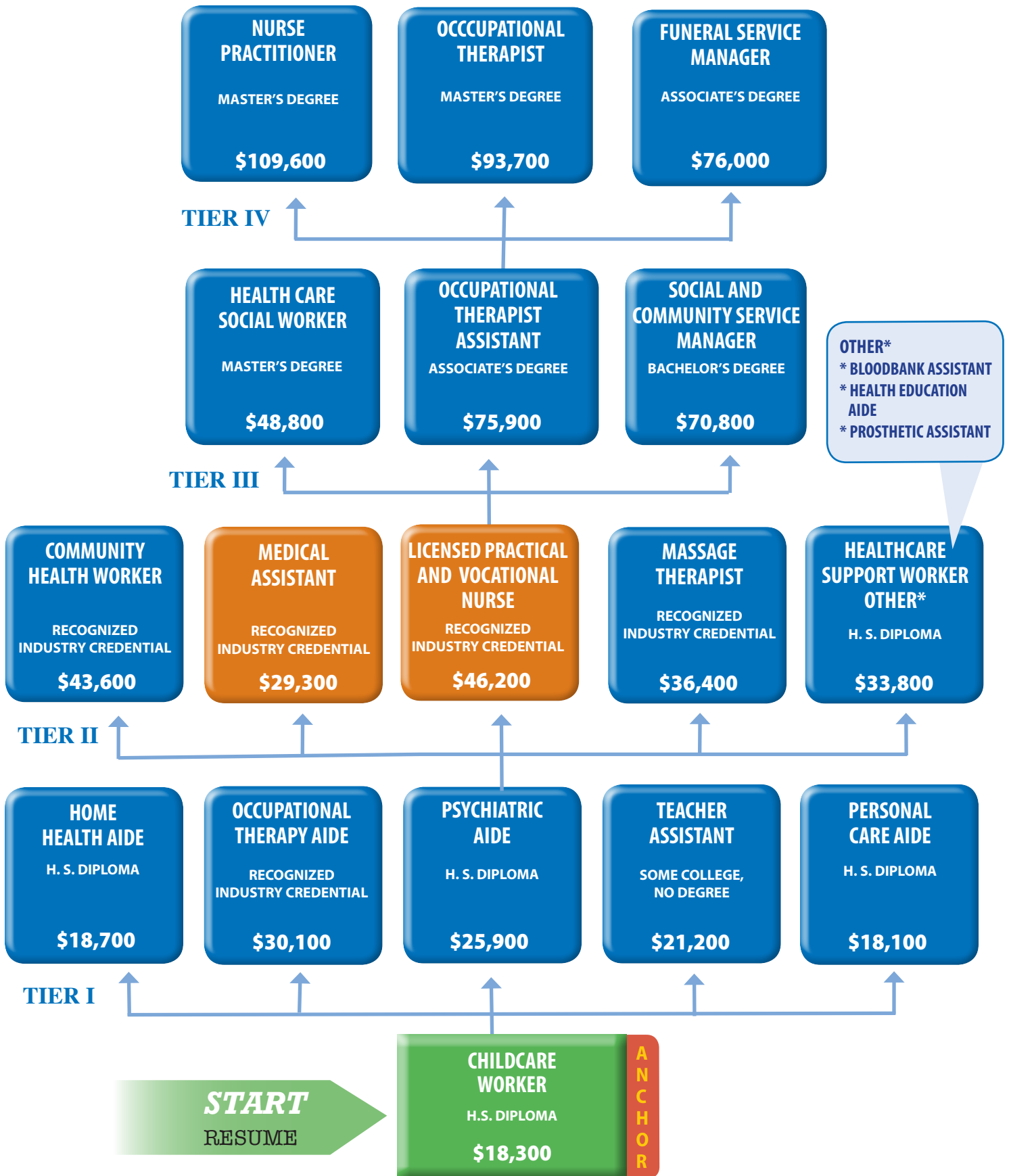
Career Progression Lattices for HOT Target Occupations Checklist

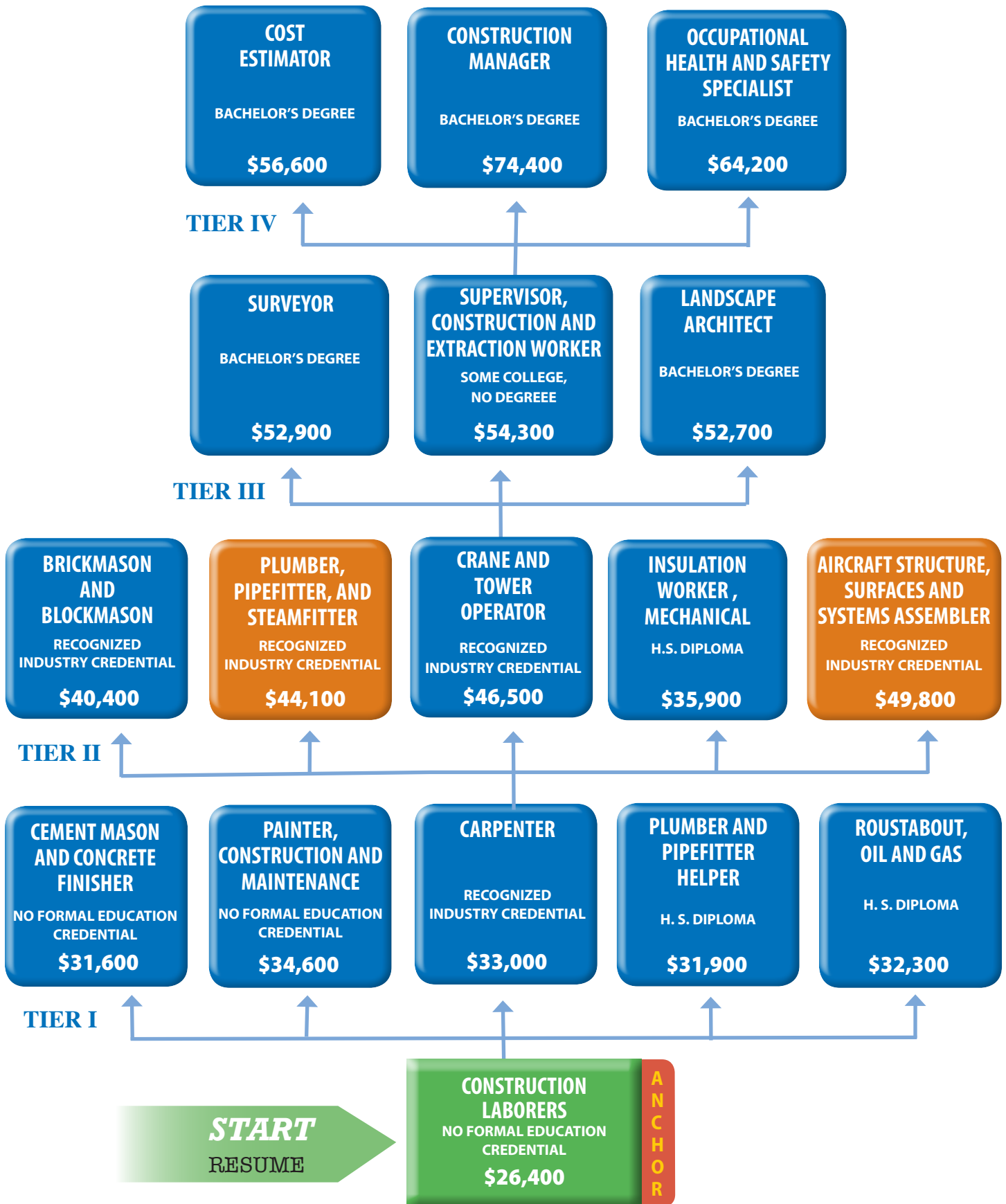
	Anchor Occupation/Lattice
Target Occupation Job Title	TARGET OCCUPATION APPEARS ON: ■ TIER 1 ■ TIER 2 ■ TIER 3 ■ TIER 4
Electricians	Electricians Helper
Firefighters	Lifeguards & Other Recreational Protective Service, Security Guard
General & Operations Managers	Hotel Desk Clerk, Supervisor, Food Preparation and Serving Workers
Heating, AC, & Refrigeration Mechanics & Installers	Maintenance and Repair Worker, General
Heavy & Tractor-Trailer Truck Drivers	Driver/Sales Worker
Industrial Machinery Mechanics	Grinding, Polishing Workers, Hand, Maintenance and Repair Worker, General, Outdoor Power Equipment Mechanic
Licensed Practical & Licensed Vocational Nurses	Childcare Worker, Home Health Aide, Personal Care Aide, Psychiatric Aide
Machinists	Grinding, Polishing Workers, Hand, Production Worker Helper
Maintenance & Repair Workers, General	Installation, Maintenance and Repair Worker
Medical & Clinical Laboratory Technicians	Psychiatric Aide, Veterinary Assistant and Lab Animal Caretaker
Medical Assistants	Childcare Worker, Home Health Aide, Psychiatric Aide
Medical Records & Health Information Technicians	Hotel Desk Clerk
Medical Secretaries	Hotel Desk Clerk

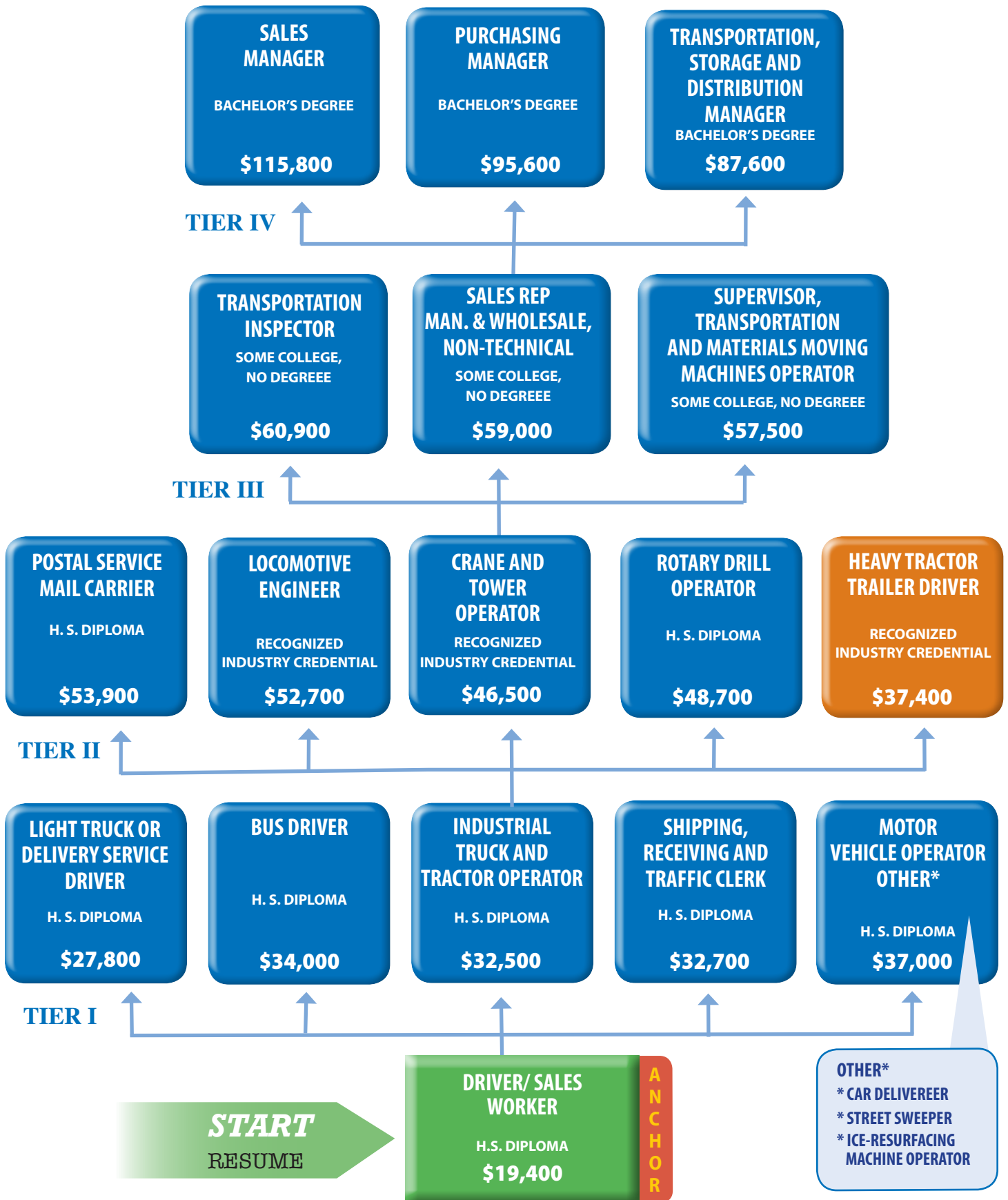
Career Progression Lattices for HOT Target Occupations Checklist

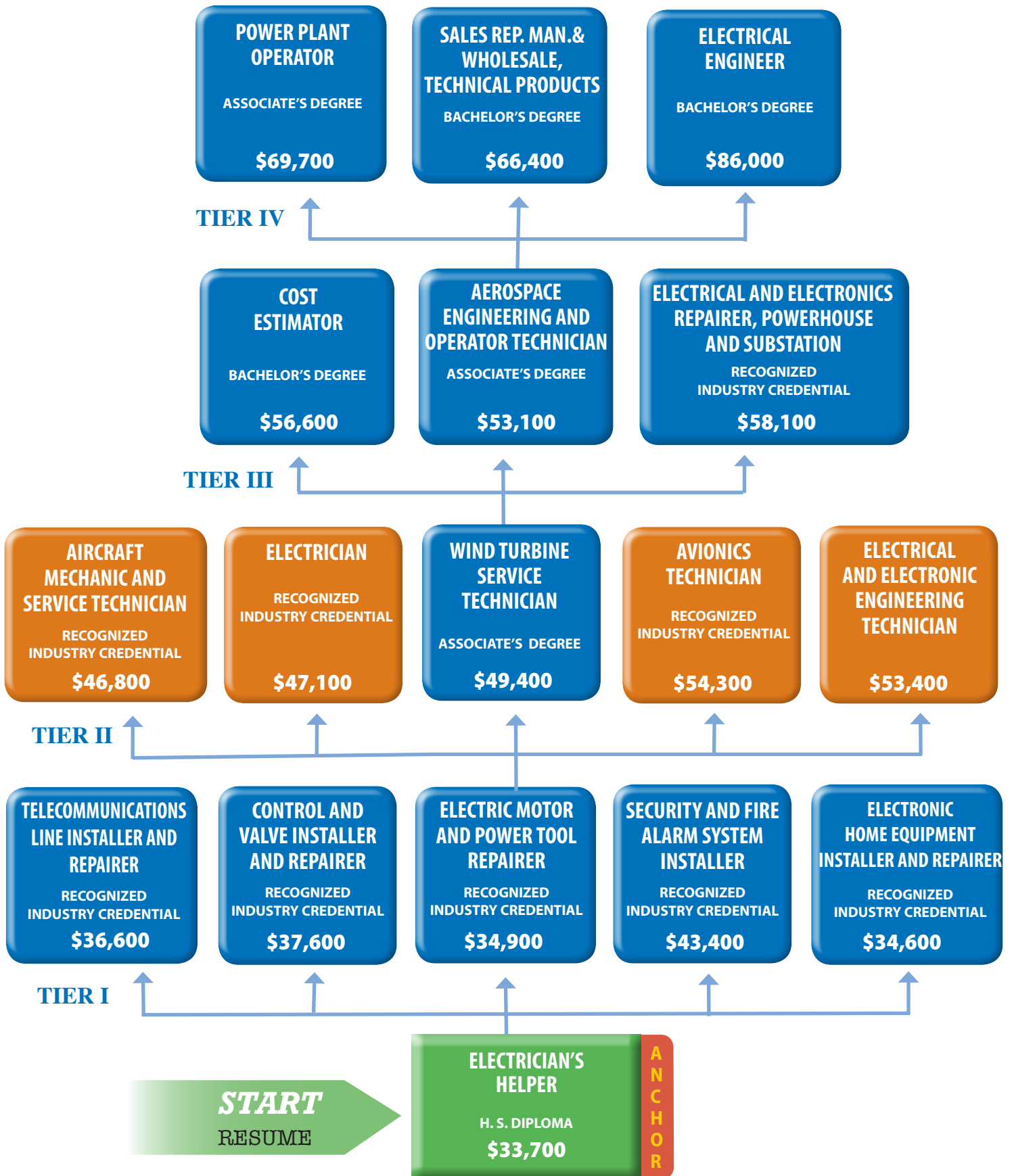
Target Occupation Job Title	Anchor Occupation/Lattice
	TARGET OCCUPATION APPEARS ON: ■ TIER 1 ■ TIER 2 ■ TIER 3 ■ TIER 4
Middle School Teachers, Ex Special Ed/CTE	Teacher Assistant
Nursing Assistants	Home Health Aide, Personal Care Aide, Veterinary Assistant and Lab Animal Caretaker
Operating Engineers	Agriculture Equipment Operator
Plumbers, Pipefitters, & Steamfitters	Construction Laborers, Maintenance and Repair Workers, General
Police & Sheriff's Patrol Officers	Lifeguards & Other Recreational Protective Service, Security Guard
Radiologic Technologists	Home Health Aide, Psychiatric Aide
Registered Nurses	Home Health Aide, Personal Care Aide, Psychiatric Aide
Respiratory Therapists	Personal Care Aide, Psychiatric Aide
Secondary School Teachers, Ex Special Ed/CTE	Teacher Assistant
Secretaries & Administrative Assistants	Receptionist and Information Clerk
Supervisors, Production & Operating Workers	Grinding, Polishing Workers, Hand, Food Processing Worker
Water & Wastewater Treatment Plant Operators	Agriculture Equipment Operator, Food Processing Worker
Welders, Cutters, Solderers, & Brazers	Grinding, Polishing Workers, Hand, Production Worker Helper

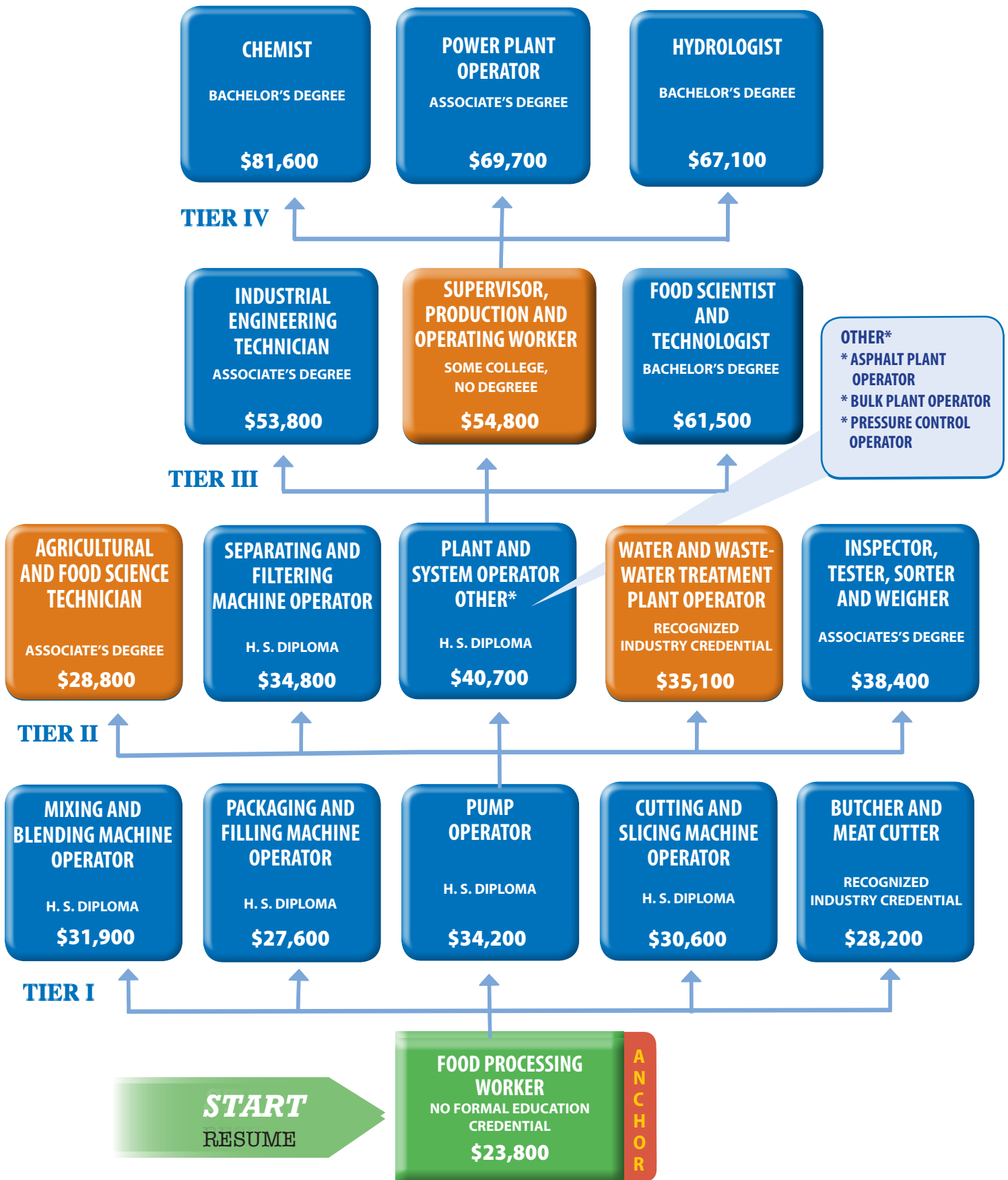


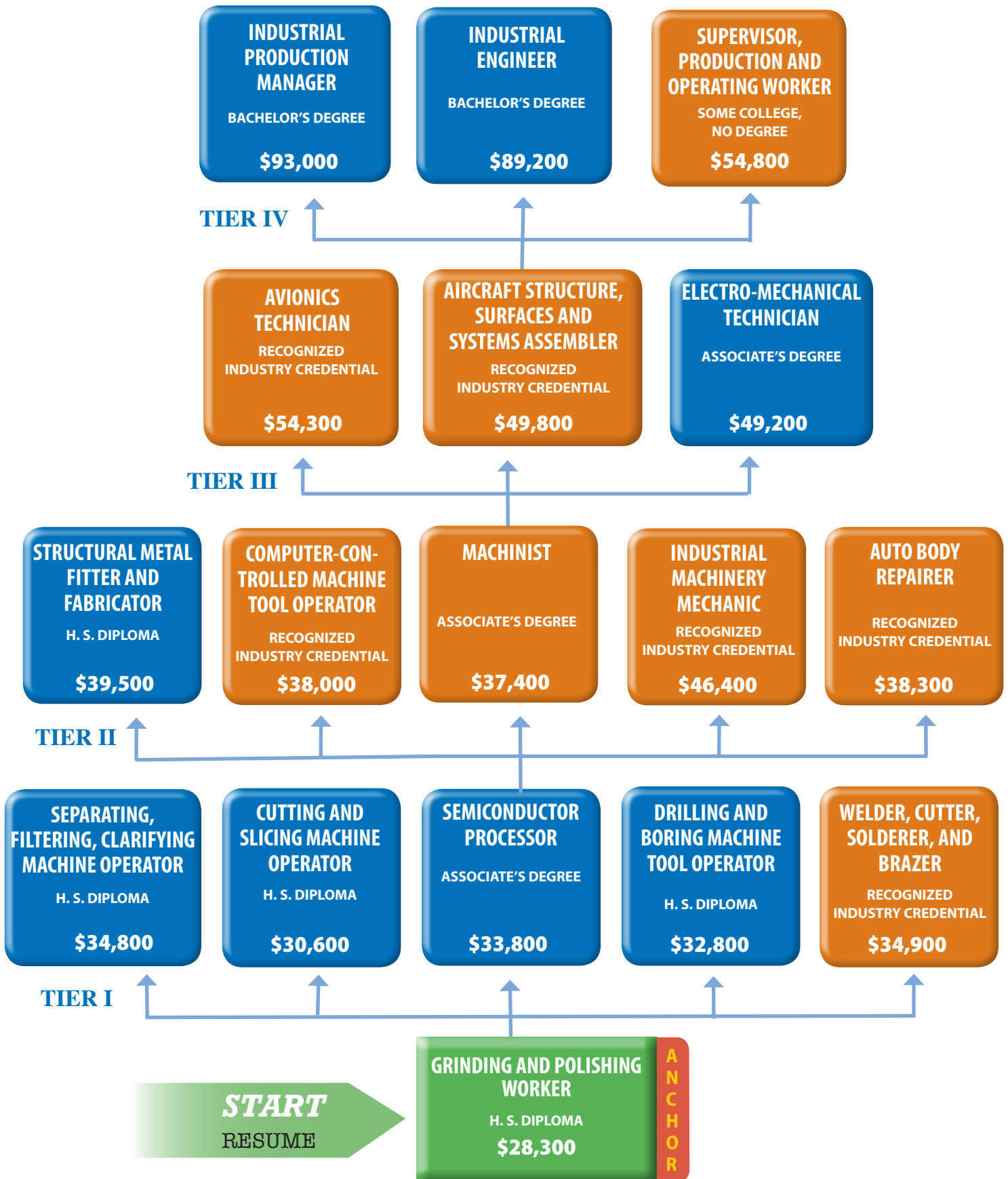


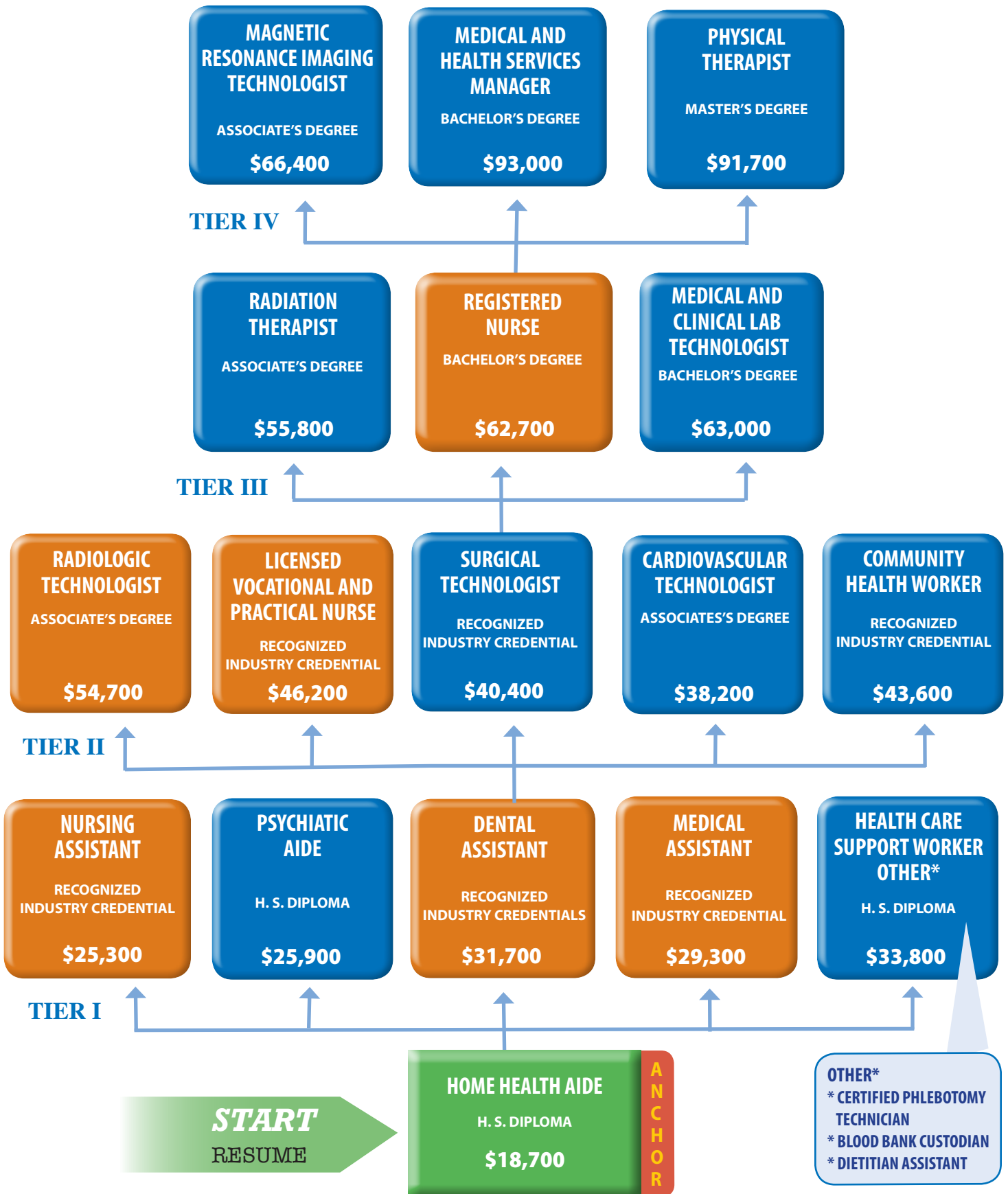


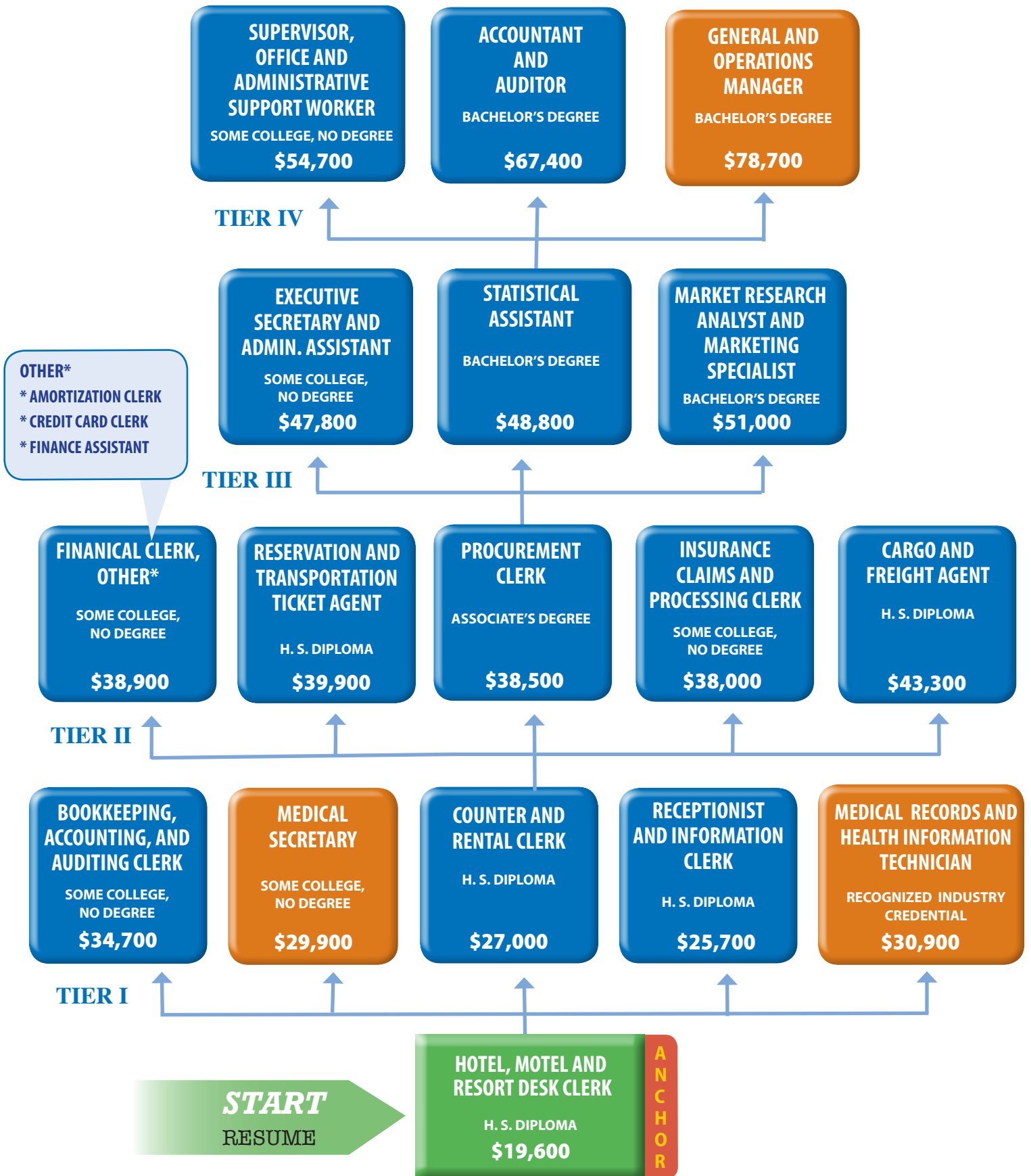




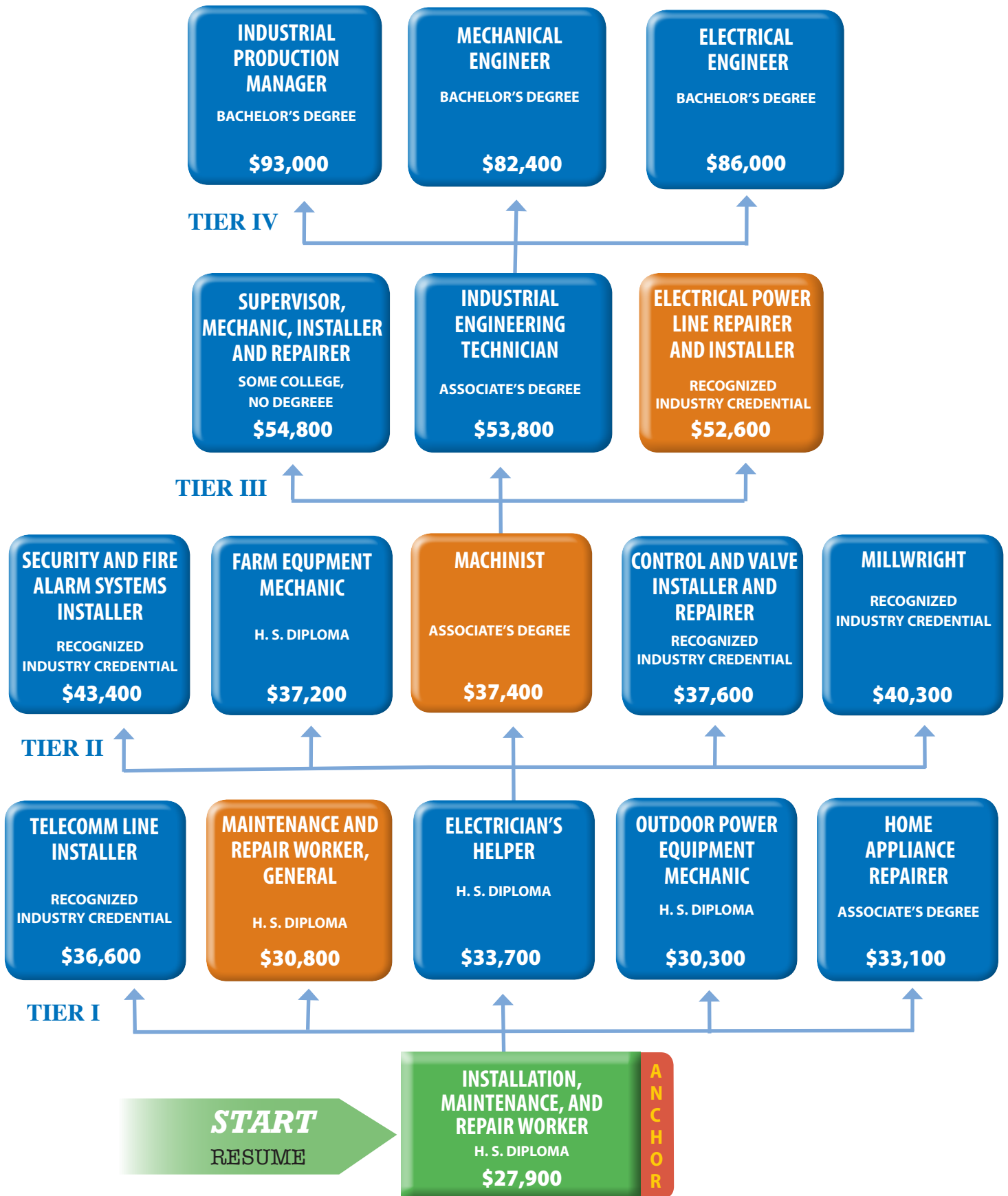




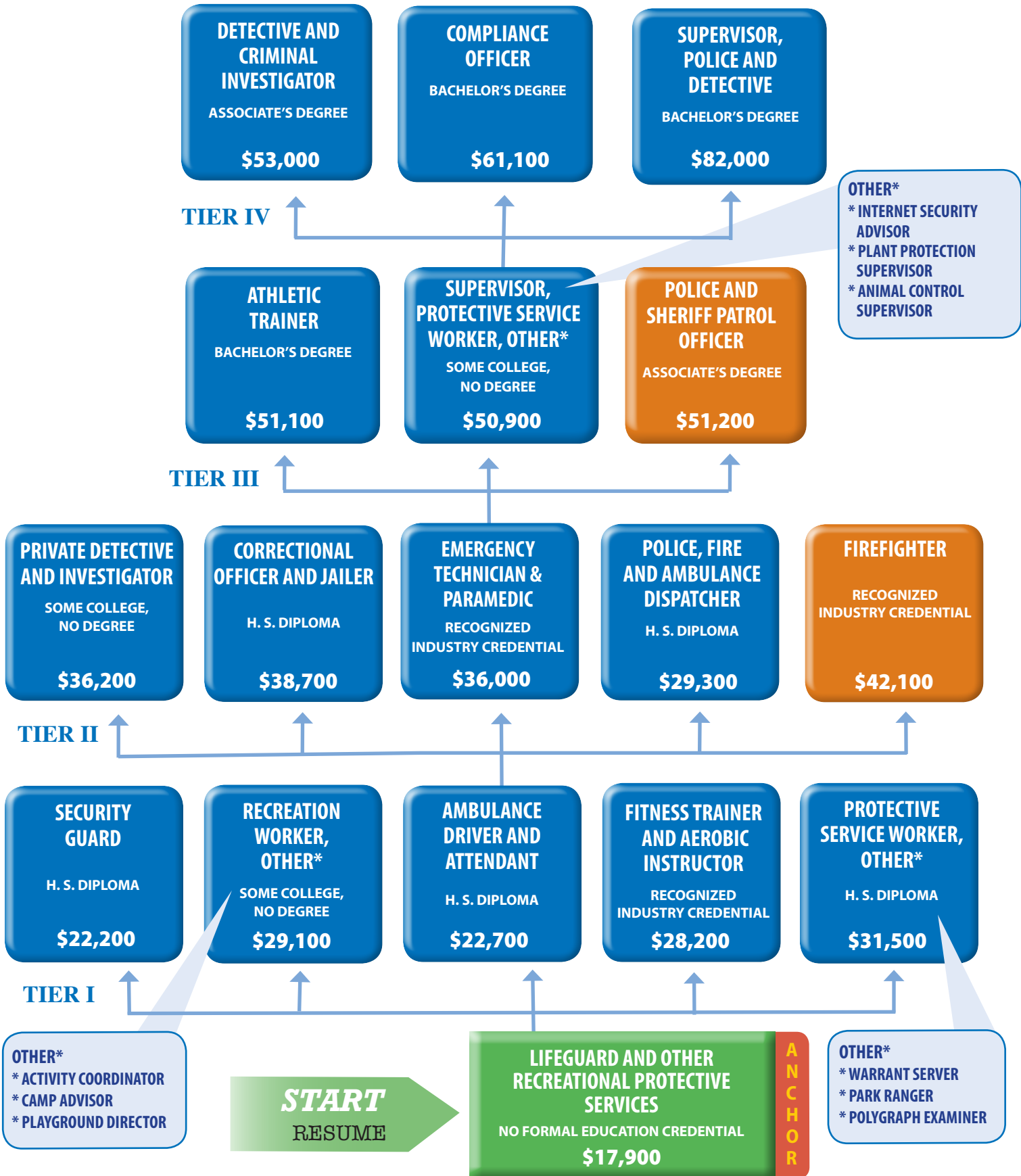


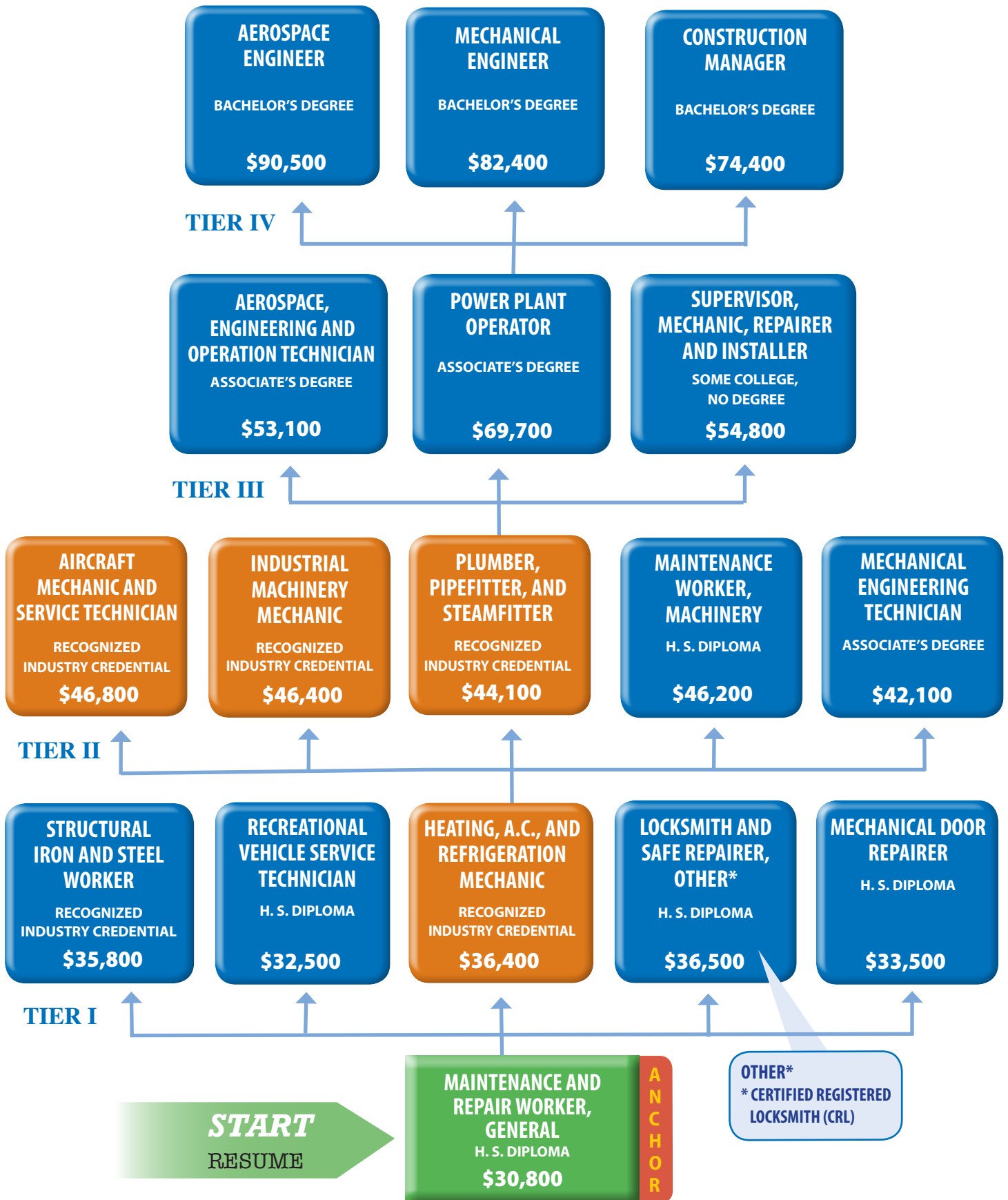


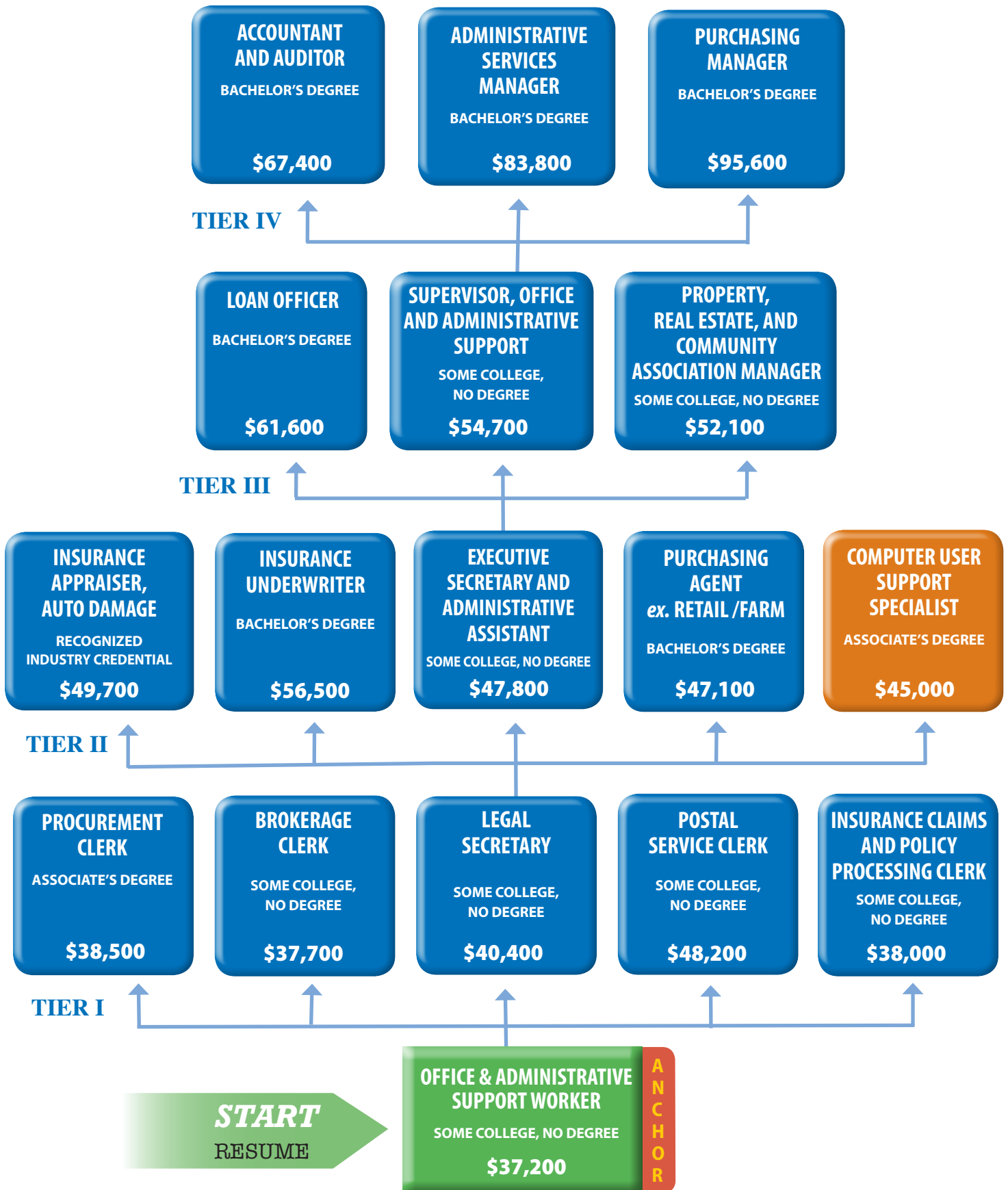
INSTALLATION, MAINTENANCE AND REPAIR WORKER



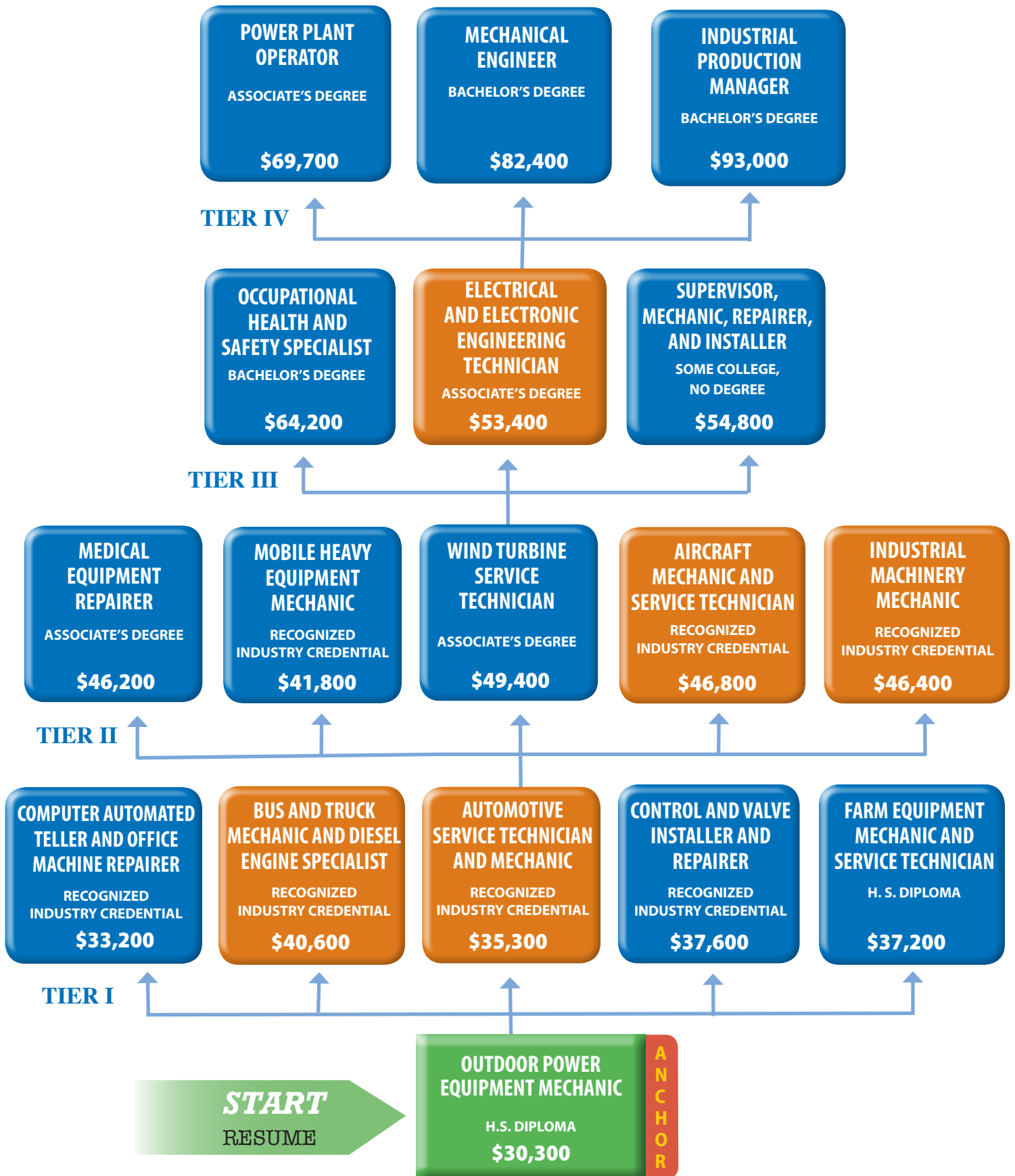
LIFEGUARD AND OTHER RECREATIONAL PROTECTIVE SERVICES

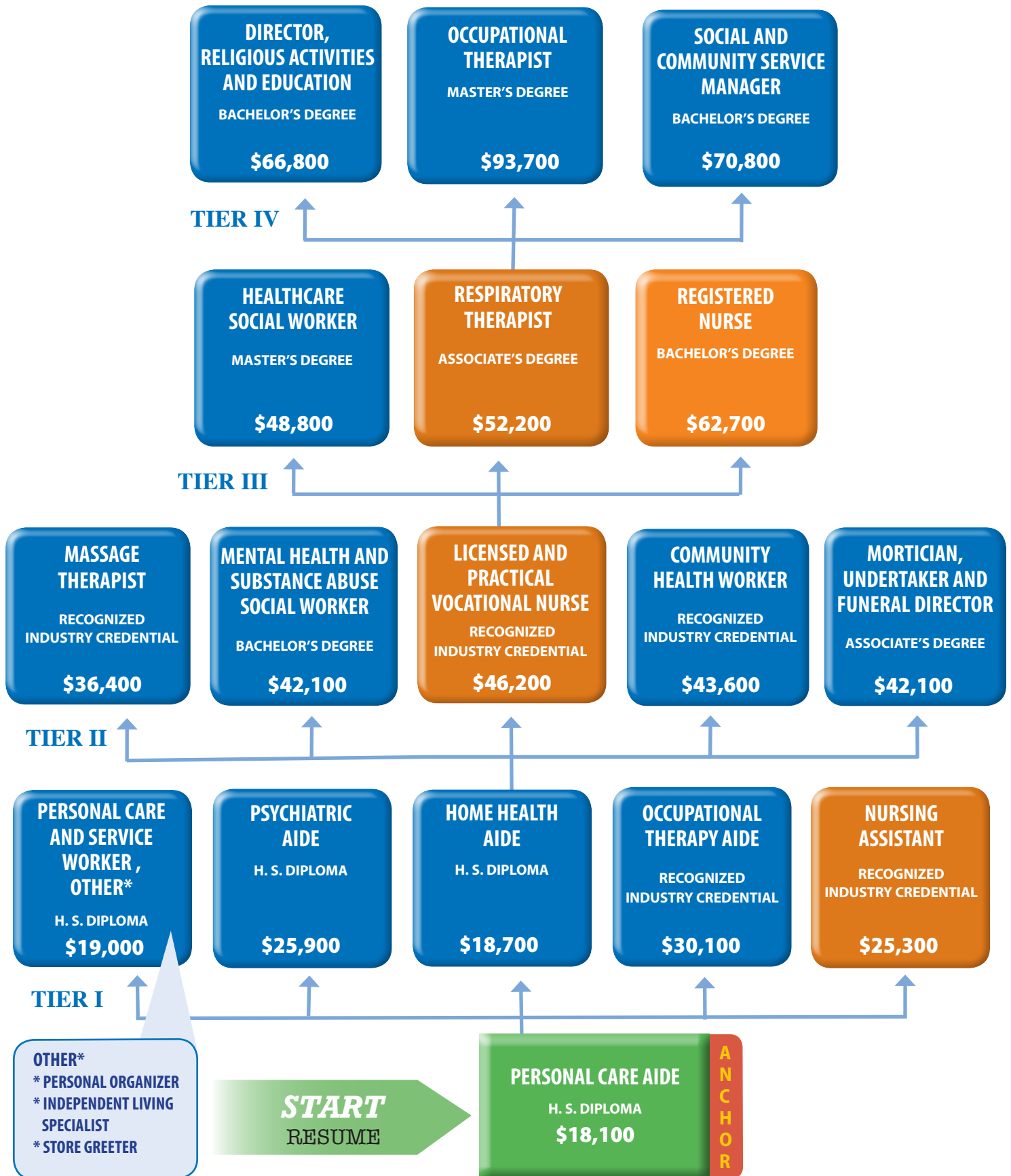


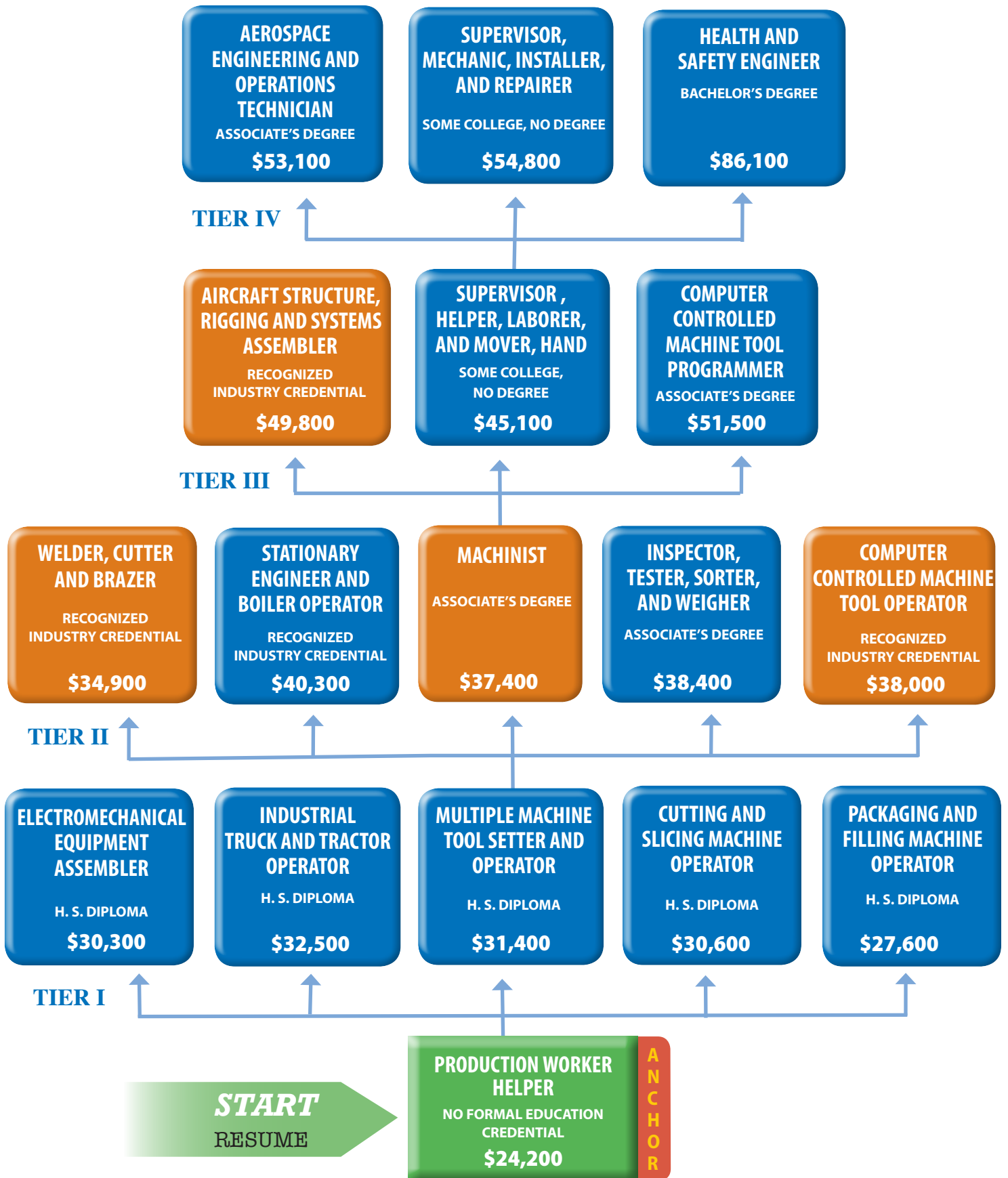


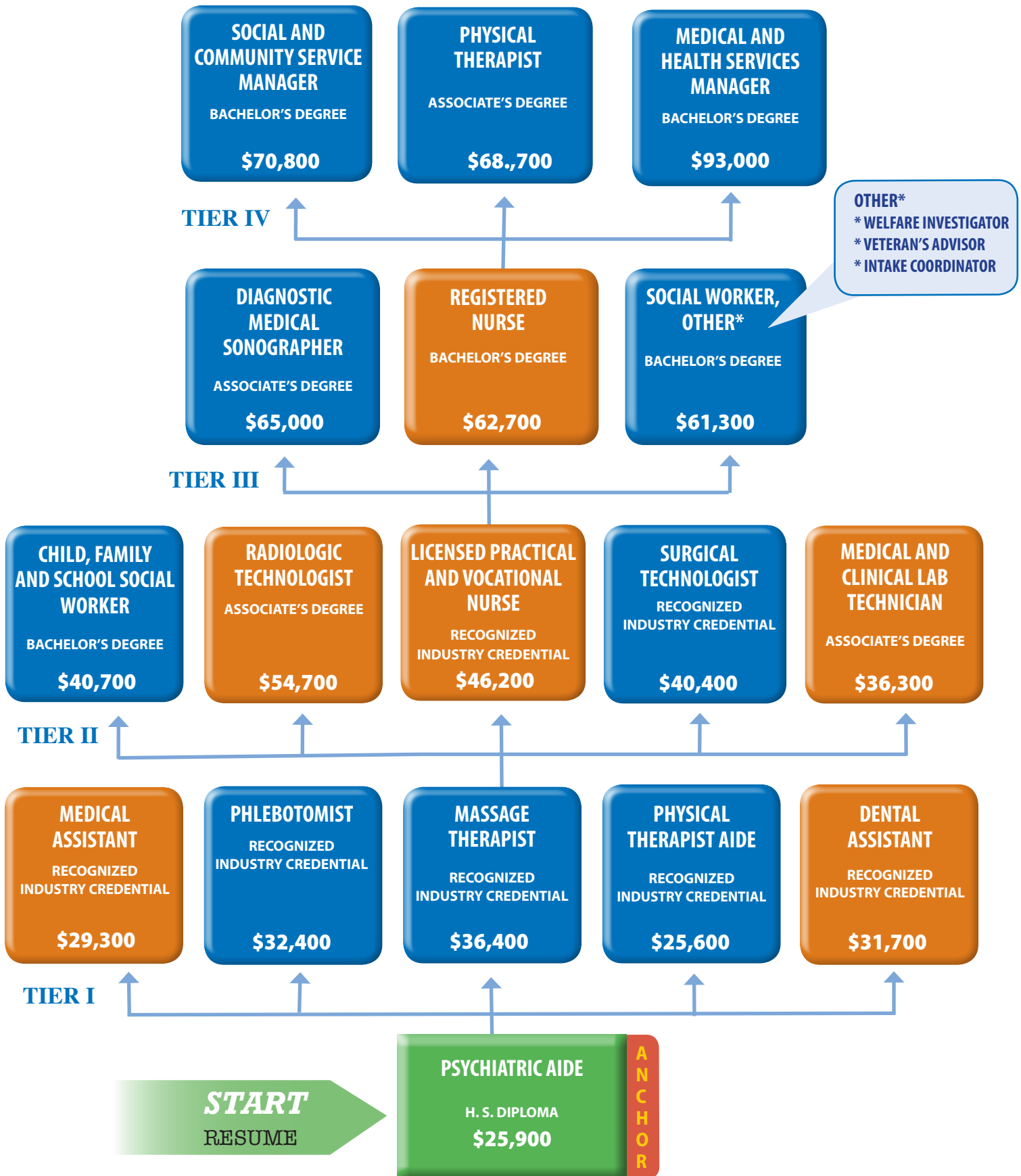


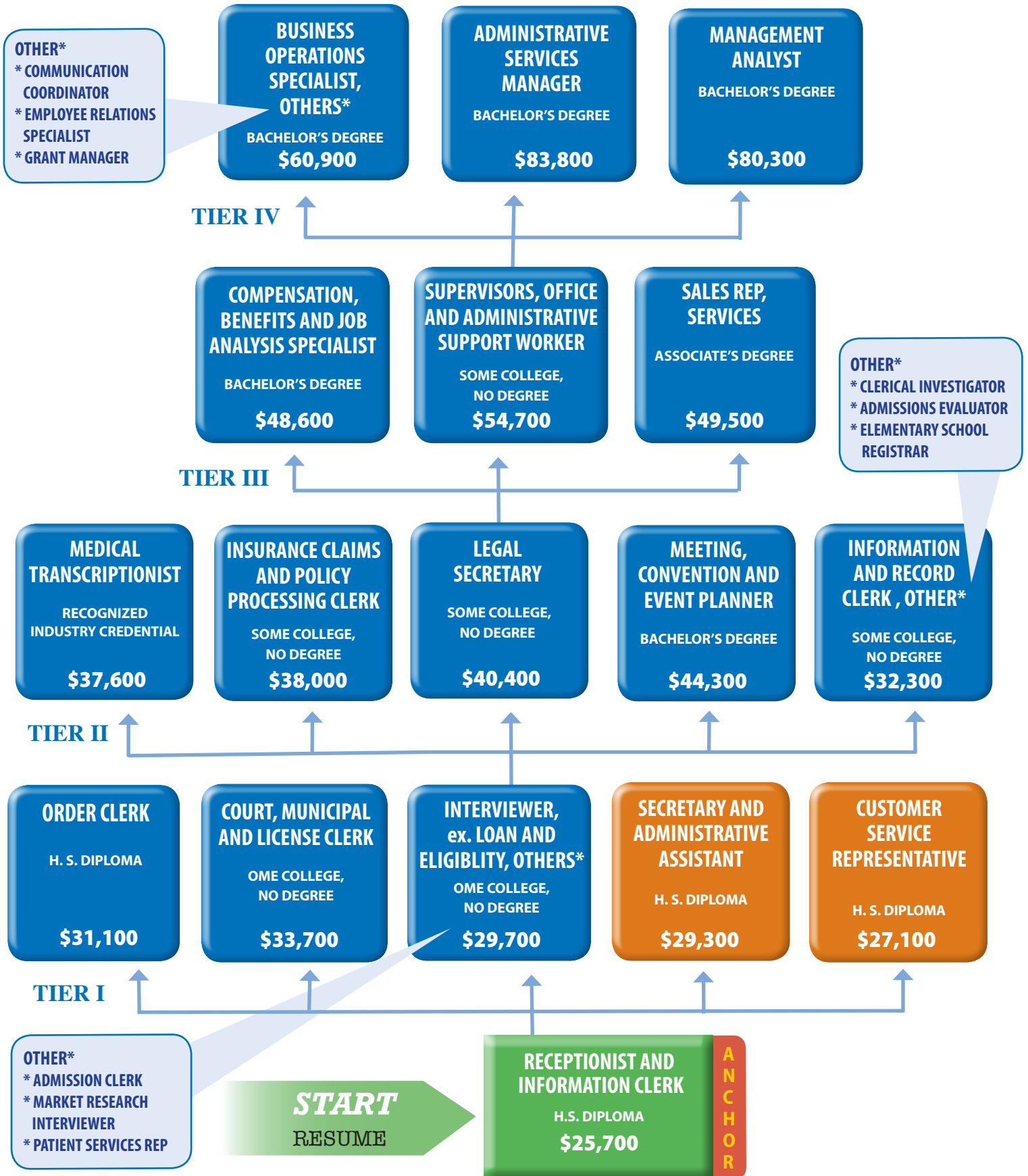
OUTDOOR POWER EQUIPMENT MECHANIC (SMALL ENGINE MECHANIC)

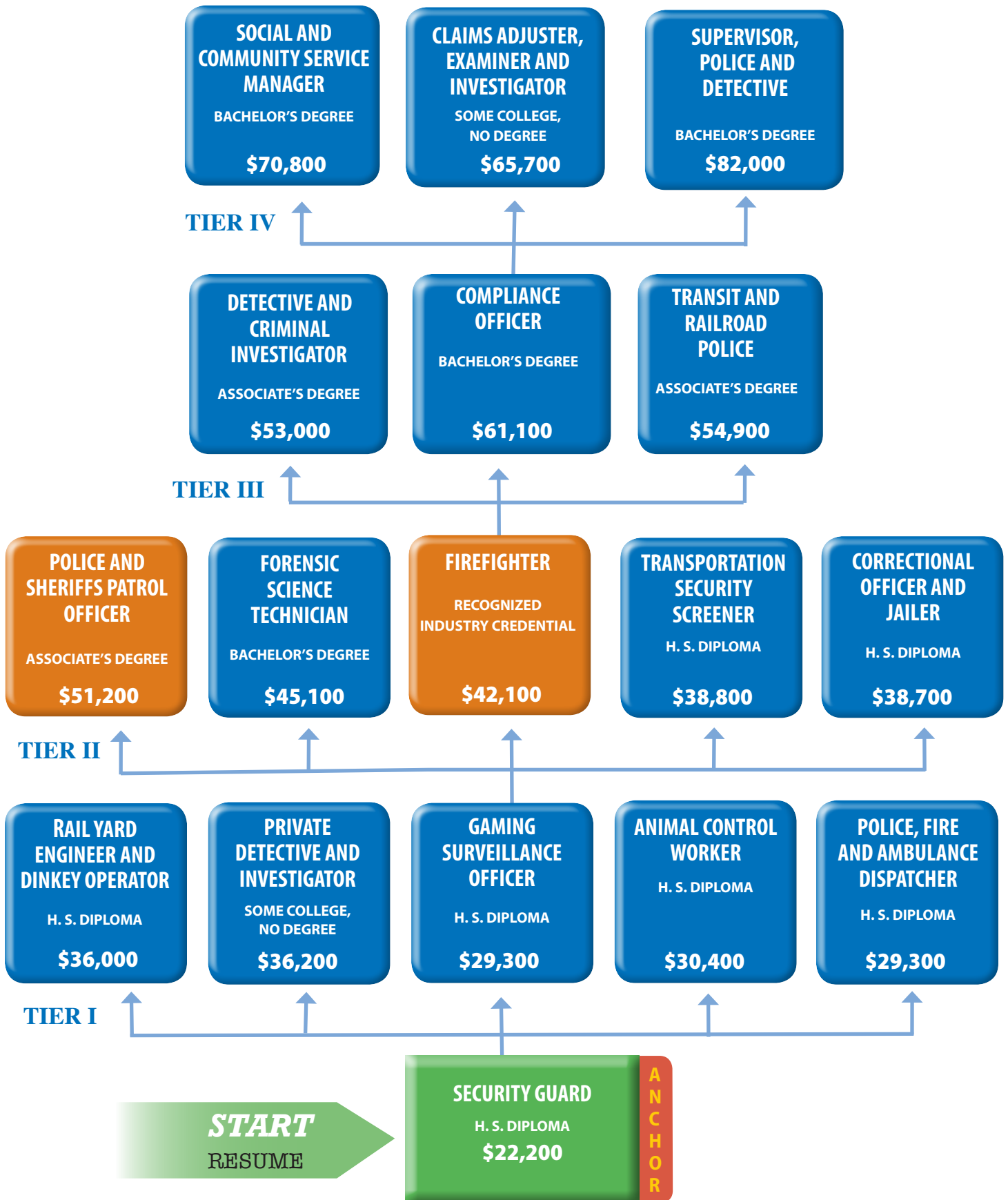


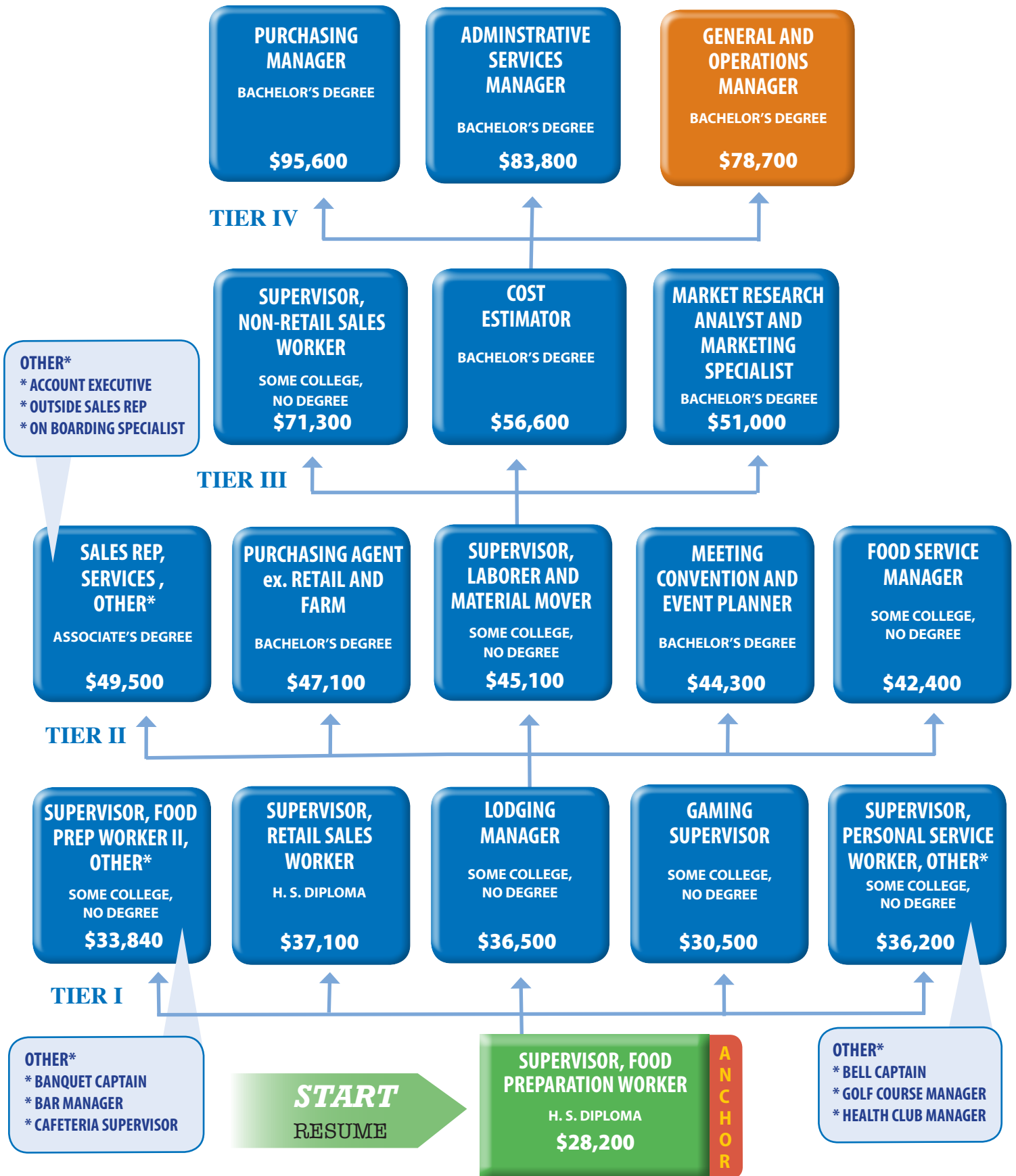


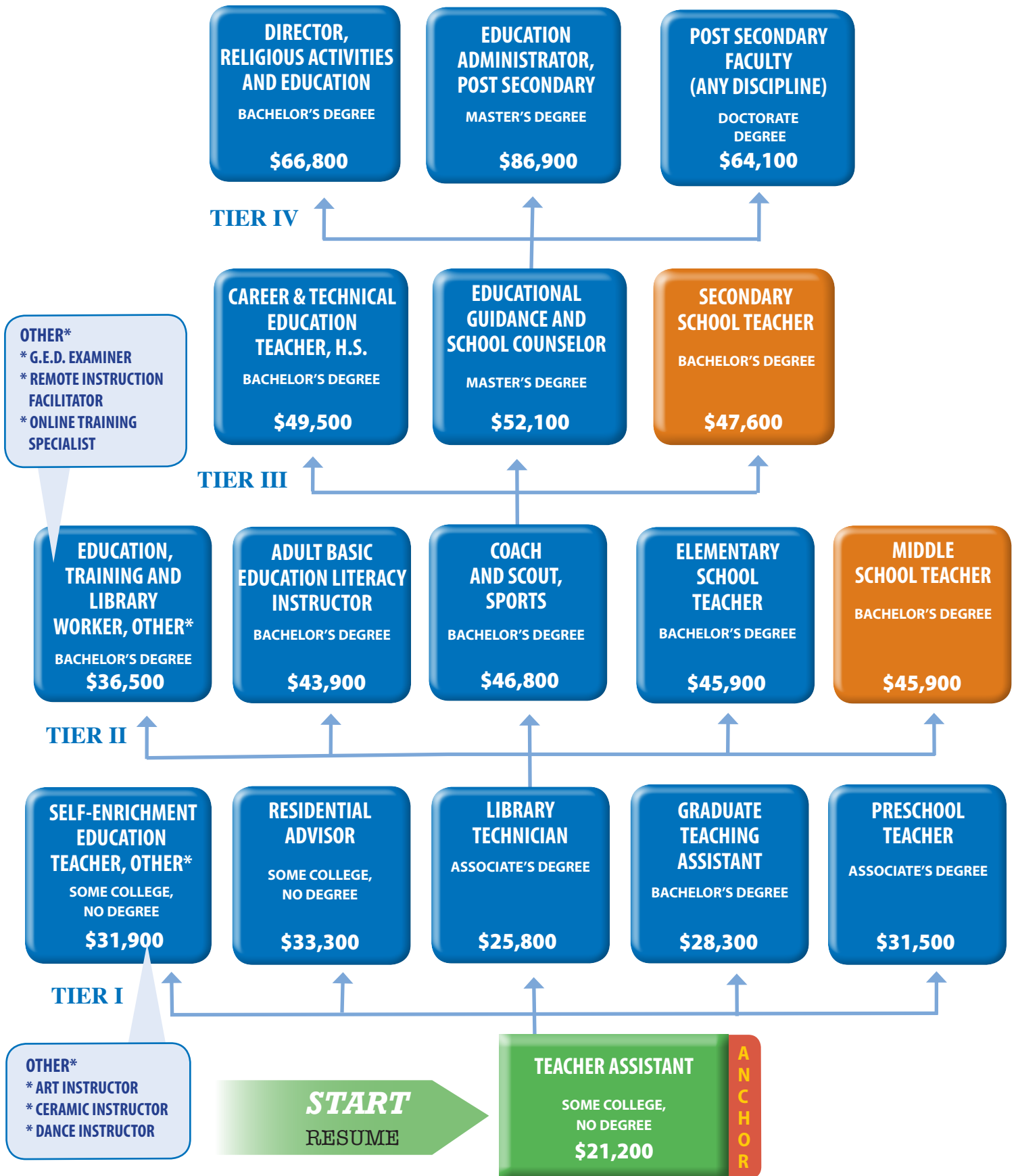


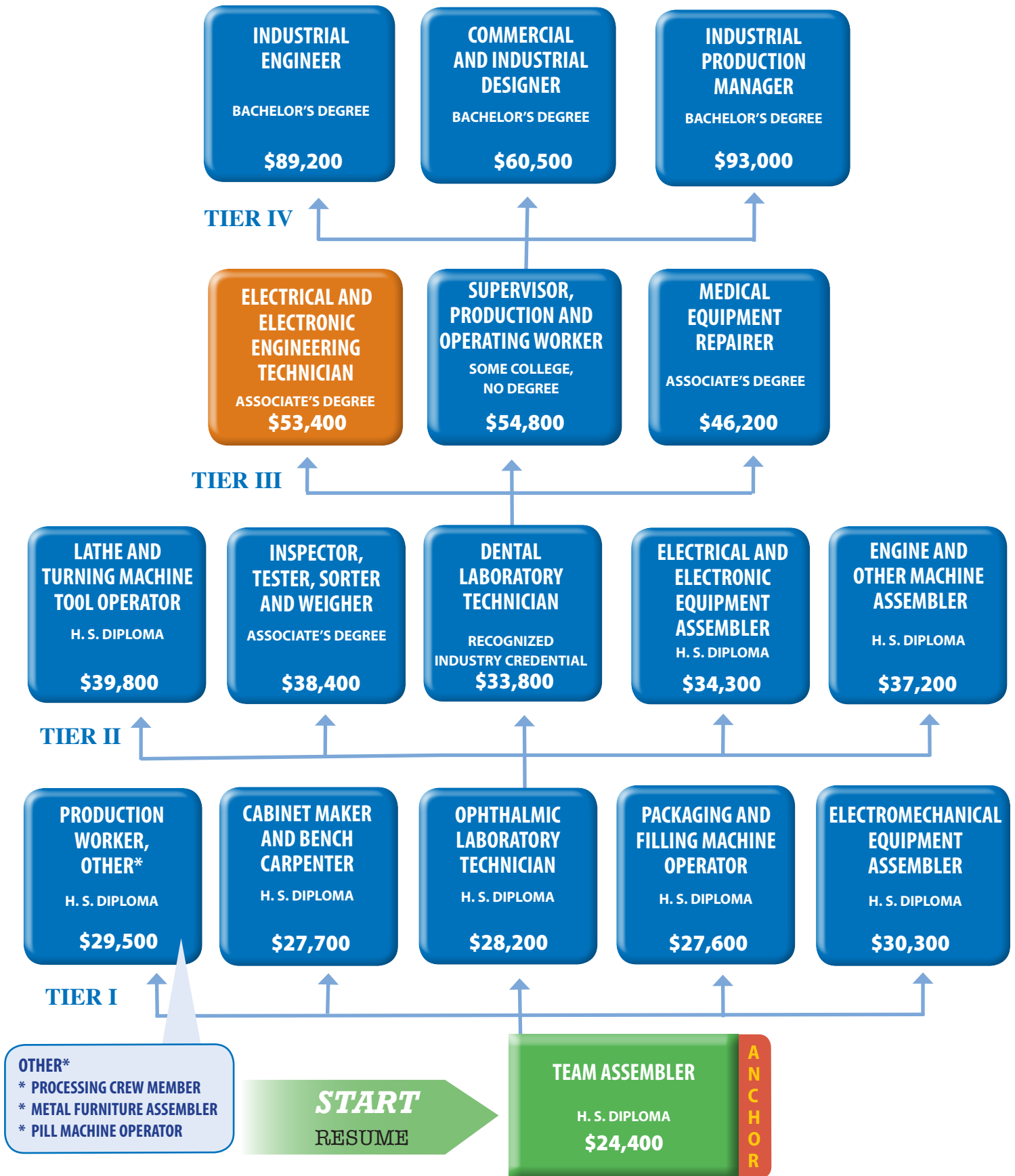












VETERINARY ASSISTANT AND LAB ANIMAL CARETAKER

