21ST CENTURY JOBS AND THE SAN ANTONIO WORKFORCE:

SA2020® TALENT PIPELINE TASK FORCE REPORT

SA2020

METHODOLOGY

The data used in this report was compiled from a variety of sources recommended by educational and industry leaders, who also made significant investments in vetting and analyzing the data. Data support was provided by Community Information NOW (CI:NOW), the Council for Adult and Experiential Learning (CAEL), and Workforce Solutions Alamo (WSA). Career pathways were developed by CAEL with the matching of education supply data and labor market needs supported by CI:NOW, CAEL, and SA2020.

Data sources cited in this report include Economic Modeling Specialists International (EMSI), Wanted Analytics (WA), and Burning Glass Technologies (BG), supporting a mixed-methodology approach of traditional and real-time data. The data analysis was locally validated through industry and chamber of commerce sector groups, as well as in partnership with the San Antonio Manufacturing Association (SAMA) and Port San Antonio. In addition, this report was able to draw on related studies completed by the University of Texas at San Antonio (UTSA) and commissioned by SAMA, an IT study conducted by Project Quest, and a Deloitte report on cybersecurity produced by the San Antonio Chamber of Commerce. Focus groups were held in partnership with the San Antonio Chamber of Commerce's Cybersecurity and Health and Biosciences committees, the North San Antonio Chamber of Commerce's CIO group, and the Health Cell. Additional data was provided by P16Plus Council of Greater Bexar County.

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The Talent Pipeline Task Force Report is interactive. **This** is clickable, and will either take you to another page in the report or an outside link.

SA2020®

A Big Vision

IN 2010...
San Antonio residents came together to shape a bold vision of success for our city by the year 2020. As a result of that process, 58 community measures of progress were developed across 11 cause areas such as education, economic competitiveness, arts and culture, transportation, and environmental sustainability.

SA2020, the nonprofit, was created in 2012 and serves as the catalyst for progress on the SA2020 community vision by tracking progress, supporting partners working in those cause areas, and engaging the public.

Since SA2020 focuses on data to make decisions, the organization identified education and economic competiveness as areas within the vision with interconnected goals. Improvements in these areas could ultimately create a ripple of positive outcomes throughout the community on many other SA2020 goals. Of course, achieving these outcomes,

as defined in the SA2020 vision, will require collective action by the community.

For more information on SA2020, please visit **www.SA2020.org.**

THE OPPORTUNITY
Since the SA2020 community vision was set, San Antonio has seen educational attainment improve, particularly **high school graduation rates,** which have already met the target of 85%. Modest gains in **college attainment** have also been made over the years; however, not at the accelerated rate required to meet the SA2020 target of 50% of the population by 2020.

While the number of people **employed in target industries** is currently on track to meet the SA2020 goal, we know that our population is projected to grow by 1 million by the year 2040, and industry needs continue to grow disproportionately to the skill attainment of our workforce.

Our community has an opportunity to strengthen its home-grown workforce through a strategic, collaborative plan that ensures local residents can find opportunity, and local industry can meet growing needs.

Building on the 2013 **HB 5 legislation,** which requires 8th grade students to choose a "career endorsement," as well as expand options for students to gain industry-recognized credentials and/or dual-college credit in high school, San Antonio industry leaders have taken the next step: creating more cohesive strategies and agreeing to a new level of commitment to close our local skills gap.

This report is intended to tackle one key component of economic development – workforce – and should be seen as one key part of an overall strategic plan for our city's economic progress, including sector-based strategies to support the growth of these industries.

SA2020 Vision for Education
By 2020, San Antonio has orchestrated one of the greatest turnarounds in education in the United States. The city is propelled forward by an approach where students learn, teachers thrive, parents engage, and citizens contribute to meet the challenges and opportunities of the 21st century in a way that rivals any city in America.

Launch of San Antonio Works! (March 2015) Photo Courtesy of San Antonio Chamber, Photo Credit Jonathan Alonzo

The Talent Pipeline Task Force

The Talent Pipeline Task Force was formed in early 2014 to develop a plan to better connect education and training to the labor market in three main targeted industries as identified in the SA2020 community visioning process:

- ✓ Healthcare & Biosciences

- ✓ Information Technology and Cybersecurity, and

- ✓ Advanced Manufacturing, with a specific focus on Transportation Manufacturing, or Automotive and Aerospace.

According to Economic Modeling Specialists International (EMSI), these represent major areas of strength in our economy that are expected to continue to experience high growth, high demand, and offer high pay.[1] **The San Antonio Economic Development Foundation** also identified these as targeted industries of focus, as well as energy.

From January 2014 through May 2015, SA2020 convened the Talent Pipeline Task Force, a diverse mix of employers, workforce development leaders, chambers of commerce, and postsecondary education and social service providers to create a framework and develop recommended strategies to close the skills gaps in these targeted industries. In addition, the Task Force agreed to a middle-skills strategy, targeting jobs that require more than a high school diploma and less than a bachelor's degree as the core focus of its work to engage educators and industry to work in partnership.

In order to embed that strategy in a broader framework, the Task Force also developed career pathway documents to illustrate the necessary training, skills and credentials for individuals to move from entry-level to high-skilled jobs in the targeted industries and related occupations.

During the Task Force's work, complementary and aligned efforts began to emerge, which have already contributed to a more aligned education-workforce system across a diverse array of leadership partners that will grow beyond the life span of this group. This work was built upon a history of industry starting many of the local foundational initiatives, from the curriculum for the Alamo (career) Academies, to the successful Just-in-Time training model, to a teacher externship program that has gained state attention.

Talent Pipeline Task Force members met monthly to study and assess the current educational and workforce landscape, build and strengthen relationships and partnerships, contribute to and review data analyses, and develop strategies based on the following core principles to close the skills gaps in the targeted industries.

SA2020 Vision for Economic Competitiveness

In 2020, San Antonio is recognized as a leader in business that prospers through innovation in 21st century industries. San Antonio has a highly qualified and educated workforce and provides economic opportunity for all of its residents.

Photo courtesy Rackspace Hosting

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[1] 2014-2020 San Antonio Data.

Core Principles & Goals

CORE PRINCIPLES

Members agreed that the work of the Talent Pipeline Task Force would be:

- Industry-Led
  - Industry must bring a career focus to K-12 and postsecondary education career pathways, offer steady feedback, and commit to applied learning opportunities;

- Data-Driven
  - Improve data systems, data confidence, and use data to inform decisions;

- Dual-Pipeline Focused
  - Simultaneously focused on both current students and the incumbent workforce (adult learners, displaced or under-skilled existing workers, or those who need support to move to the next rung on a career ladder).

> Once employers begin to understand their role as the 'end customers' in managing talent supply chains, they can reshape the education and workforce systems as an extended chain of talent providers that prepare learners for careers in the most responsive and efficient way possible.
>
> Jason Tyszko, US Chamber of Commerce Foundation, **Managing the Talent Pipeline** (2014)

GOALS

In order to achieve its vision of closing the skills gaps in the targeted industries, the Task Force created the following goals, spanning the K-12 educational system, postsecondary education, and workforce:

1. Increase college and career readiness by growing:
   a. the number of students who receive postsecondary credit in high school (Advanced Placement (AP), dual credit, International Baccalaureate (IB), or industry-recognized certificates and credentials for postsecondary credit), and
   b. the number of high school students who have a meaningful work experience.

2. Expand high school dual credit offerings in coursework relevant to targeted industries – Science, Technology, Engineering and Math (STEM) and Career & Technical Education (CTE);

3. Increase applied learning opportunities (internships, fellowships, apprenticeships, etc.) in high-demand fields;

4. Promote teachers/instructors with industry experience;

5. Exponentially increase the workforce in **IT/IS** and **healthcare** to close the skills gaps in these industries;

6. Grow specialized training for cybersecurity to complement a stronger foundation in IT and STEM beginning in K-12;

7. Increase skilled trades and journeymen to fill future gaps after anticipated wave of retirement; and

8. Continue the training of specialized workers for aerospace.

San Antonio's Incumbent Labor Force:
Educational Attainment for Adults 25-64
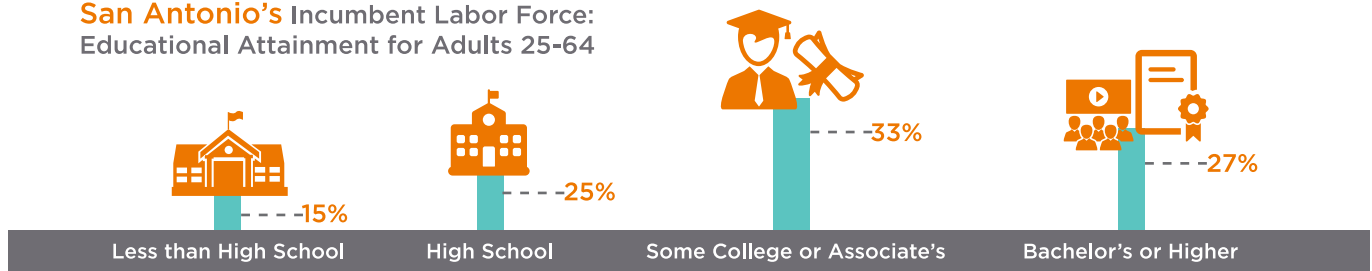
--15% Less than High School

--25% High School

--33% Some College or Associate's

--27% Bachelor's or Higher

Source: U.S. Census Bureau, 2009-2013 American Community Survey 5-Year Estimates for Bexar County.

TARGET POPULATIONS

The Task Force identified two populations as targets for opportunity

The first group is adults who have started college but have not obtained a degree, which has been estimated to be 222,000 individuals in San Antonio.[2] While some may have significant barriers – such as large debt – and others may have left school for job opportunities – it is conceivable that some within that group could achieve a career bump through the accelerated completion of a degree, and possibly even be directed toward high-demand occupations. Within that group, nearly 160,000 had completed more than one year of a college degree.[3]

The second group is "Opportunity Youth," ages 16-24. According to **The Economic Value of Opportunity Youth**, this group may have one or all of the following qualities: dropped out of high school or college and been unable to find work; been involved in the criminal justice system; mental or health conditions that have inhibited their activities; or care-giving responsibilities in their families. In short, this group is unconnected from jobs or education. This group, with much of its work life ahead of it, represents an opportunity for San Antonio's future economy. Of the estimated 400,730 youth, ages 16-30[4], in Bexar County, an estimated 12.35% (or 49,971) are considered "opportunity youth."[5]

THE SKILLS GAP IN SAN ANTONIO

SA2020 worked with numerous local and national organizations to crosswalk real-time labor market information to educational data. While more detailed skills gap numbers can be found in each of the industry reports, some common themes across all sectors include:

1. A need for coherent career pathways to expand the pool of overall trained workers in these strategic industries; and

2. A focused, middle skills strategy with the potential for future career growth with additional training and/or degrees.

Middle skill jobs are typically defined as those requiring more than a high school diploma and less than a bachelor's degree.

ADDITIONAL KEY FINDINGS

Healthcare and Information Technology, including cybersecurity, have the largest talent gaps, validating their places as targeted industries for San Antonio. Currently, to meet demand, San Antonio likely imports talent in these two areas.[6]

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[2] U.S. Census Bureau; American Community Survey, 2013 American Community Survey 1-Year Estimates. (Estimates based on data from the population 25+ with some college.)
[3] U.S. Census Bureau; American Community Survey, 2013 American Community Survey 1-Year Estimates. (Estimates based on data from the population 25+ with some college.)
[4] Data was only available for 16-30, even though most "Opportunity Youth" are identified as 16-24.
[5] Census Bureau, 2008-2012, 5% Public Use Micro Sample.
[6] IPEDS, San Antonio Postsecondary Completions 2012-2013 and Burning Glass Labor Market Data, Full Year 2013.

Healthcare and Biosciences

- For every 2 jobs posted in healthcare, the region's largest sector, just 1 person had the appropriate training;

- While healthcare has stronger existing education programs, gaps still exist, validating the idea of identifying missing programs or expanding the most successful ones;

- While biosciences and healthcare should be part of a connected ecosystem, the field of biosciences has suffered a declining competitive advantage during a time of reduced federal research funding. Larger economic development strategies to strengthen that industry were laid out in the April 2015 Strategic Planning Recommendations for **San Antonio's Bioscience and Healthcare Industries** by the San Antonio Medical Foundation.

Information Technology (IT) & Cybersecurity
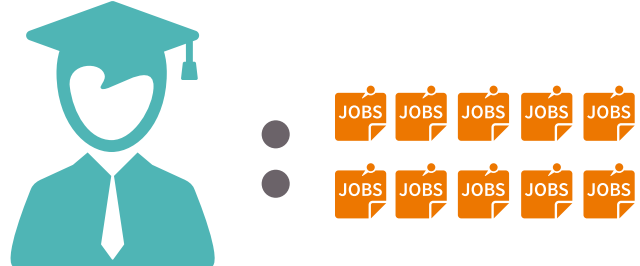
- For every 10 jobs posted in the broad IT field, just 1 person had the appropriate training — although the IT/IS gap is likely overestimated because 1) jobs measure across many industries beyond the targeted industries and 2) jobs in IT/IS are less credential-specific (e.g. a college business graduate may have coding skills);

- Because cybersecurity pulls from the same pool as IT but typically requires more specialized training, the shortages in cybersecurity are difficult to separate but likely more acute;

- While cybersecurity needs high-level, more specialized skills and training, this industry would also benefit from a long-term effort to expand the IT ecosystem and pipeline so that the overall pool of highly trained IT workers is sufficient.

Transportation Manufacturing (Automotive and Aerospace)

- The aerospace industry relies on key pipeline strategies such as Alamo Academies, and although there is no gap currently, this specialized training must be supported continuously for the industry to be successful;

- The overall manufacturing skills gap is likely underestimated in this analysis given a common practice in this industry to use recruiting methods that are less likely to be accurately captured and categorized in the jobs data;

- There are not sufficient training programs currently in place to make up for an anticipated retirement of skilled workers in the crafts, impacting the manufacturing, energy and construction sectors between now and 2030.

$59,354 $43,256
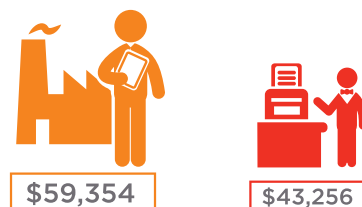
In 2014, **TRANSPORTATION MANUFACTURING WORKERS** made an average of **$59,354** in wages, salaries, and proprietor earnings, compared to San Antonio's average annual wage of $43,256.

Source: EMSI 2014 San Antonio Data

Maximizing Impact

The work of the Talent Pipeline Task Force has been propelled and inspired by the ongoing leveraging of San Antonio's assets in the areas of education and workforce. It is important to note that several significant community workforce development initiatives have already been initiated by industry (notably the manufacturing industry) to meet critical business needs. These programs include, but are not limited to: the Alamo Academies, the Just-In-Time (JIT) program, and the Teacher Externship/Professional Development program. During the Task Force's work, additional, related efforts took root.

Mayor Ivy Taylor (2015) Photo Courtesy of San Antonio Chamber, Photo Credit Jonathan Alonzo

Judge Nelson Wolff (2015) Photo Courtesy of San Antonio Chamber, Photo Credit Jonathan Alonzo

In early 2015, Mayor Ivy Taylor and Judge Nelson Wolff announced a greater leadership role in workforce for the Alamo Colleges. In March 2015, **SA Works**, an initiative funded by a gift from H-E-B Chairman Charles Butt, was established with the San Antonio Chamber as an intermediary for industry with a focus on dramatically increasing internships, apprenticeships, co-ops and teacher externships. And as a result, an ambitious goal was set to create 20,000 new applied learning opportunities, or 4,000 per year, by 2020.

As part of this latter effort, Workforce Solutions Alamo (WSA) has been tapped to provide real-time labor market information to inform career advising. Additionally, H-E-B is convening a committee to examine a career high school, and the Alamo STEM Workforce Coalition - a merger of several industry-led efforts - is dramatically expanding teacher and counselor externships. WSA and Alamo Colleges have also applied for federal funding to expand apprenticeships, and several local universities are exploring the university co-op model for potential implementation.

In April 2015, the Alamo Colleges submitted a plan for a regional **STEM Degree Accelerator Project**, another opportunity to put into practice the conceptual framework laid out in this report.

Additionally, in June 2015, the place-based strategy, **Promise Zone to Work**, set a goal to train and connect 300 Eastside San Antonio residents to in-demand employment opportunities.

Efforts such as these continue to signal the willingness of industry to proactively lead and engage with the education system to resolve current and future skills needs. The implementation of the Task Force recommendations will not be possible without building upon these successes that have laid such a solid foundation for workforce development in San Antonio.

Task Force Recommendations & Key Implementers

Community College Recommendations

In addition to the above outlined ongoing efforts, the Task Force recommends the Alamo Colleges play a lead role to:

1. Expand college and career credit in high school[7] by providing more high school students with access to college credit, including: dual credit, Career and Technical Education (CTE), International Baccalaureate (IB), Advanced Placement (AP) classes, and marketable certificates (especially in identified career pathways).

Strategic actions include:
- Strengthening and expanding the Alamo Academies;
- Expanding the dual credit certified teacher pool by making it more flexible for industry professionals to teach these courses;
- Expanding Early College High Schools in Bexar County;
- Launching 1,000 new marketable IT certificates in area high schools in 2015 and expanding this model aggressively until every high school student has an option for a CT/certificate — IT and beyond.

Career Experience Recommendations

The Task Force recommends that the SA Works coalition take the lead to:

1. Expand access to meaningful work experiences and essential skills to high school students;[8]
2. Infuse college advising with career information and data-driven degree planning[9] by:
   a. Strengthening and sharing career pathway information and regularly updating it using real-time labor market data (provided by WSA);

b. Working toward a shared advising model that spans K-12 (beginning in 8th grade), area colleges, and community-based providers; and
   c. Using skills information to infuse needed technical and essential skills into existing degree plans (data analytics into sociology, for example);
3. Explore the development of one or more career high schools;[10]
4. Support educator professional development[11] by:
   a. Facilitating an increase in the number of instructors certified to offer college credit
   b. Promoting options that allow industry-experienced individuals to serve as instructors;
5. Expand apprenticeship and co-op opportunities for community college and university students;[12]
6. Strengthen links and career pathways between and across K-12, community college and university educational systems.[13]

Career Pathway Recommendations

As part of the dual pipeline, the Task Force outlined the following strategies to ensure that adults reconnect with career pathways. Workforce Solutions Alamo (WSA), along with partner higher education institutions, will play a lead role to:

1. Expand the Just-In-Time Model[14] by:
   a. Systematizing this successful model with a comprehensive checklist and expanding it in targeted occupations; and
   b. Developing a toolkit as part of a business retention and attraction strategy for the city and county.

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[7] Task Force Goals 1, 2 and 4.
[8] Task Force Goal 3.
[9] Task Force Goals 3, 5, and 6.
[10] All Task Force Goals.
[11] Task Force Goal 4.
[12] Task Force Goal 3.
[13] All Task Force Goals.
[14] Task Force Goals, 5, 6, 7 and 8.

2. Streamline and coordinate career advising for the adult workforce[15] by:
   a. Working toward a shared advising model that spans K-12 (beginning in 8th grade), area colleges, and community-based providers;
   b. Ensuring a "no wrong door" approach among education and workforce providers, (workforce centers, Goodwill, Project Quest, colleges and university), so that no matter where an adult learner goes for help, they will receive the information and guidance that connects them to the education, training or job opportunities that best meet their needs;
3. Encourage area colleges to expand services for adult learners[16] by:
   a) Exploring one central provider and/or partnership with a national model (The Graduate! Network, for example);
   b) Creating a single entry point at each college or university for adult learners (modeling the existing military support system); and
   c) Developing targeted outreach and advising for adults with "some college."

Industry Recommendations

The Task Force recommends that Industry play a driver role in all these initiatives by:

1. Participating in the SA Works business menu of options and expanding applied learning opportunities;
2. Vetting labor market Information to inform targeted occupations, career pathways, skills requirement, curriculum development, job demand forecasting;
3. Serving in an advisory capacity for education and training, including but not limited to Just-In-Time, Alamo Academies, and the potential career centers;
4. Developing sector-based groups, which could be existing Chamber committees or other groups such as the San Antonio Manufacturing Association, that serve as key intermediaries between industry and education;
5. Examining internal practices such as tuition reimbursement or apprenticeships for incumbent workers, to align with the Task Force goals.

Additionally, in support of the goal to increase the workforce in the target industries and strengthen

the local economic environment, the San Antonio Economic Development Foundation (SAEDF) will support the creation of an economic development delivery system through the implementation of it[1]s strategic plan. It will do this by:

• Convening the SAEDF Coordinating Council member agencies to collaboratively 1) report on ongoing activities and 2) plan future activities based on effectiveness and efficiency;
• Providing a collaborative structure to industry roundtables to maximize industry expertise, direction and resources; and
• Providing an annual assessment of performance and new resources for coming years influenced by though leaders in collaborative groups in the areas of recruitment, business retention and expansion, entrepreneurial development and workforce.

Outreach and Pathway Recommendations

The Task Force – with grant support from The Lumina Foundation – partnered with the Chicago-based Council on Adult and Experiential Learning (CAEL) to develop career pathways in core occupations and industries of high need in the three targeted sectors – **Healthcare and Biosciences Pathway**, **IT/IS Pathway**, **Air Transportation Pathway**, **Transportation Manufacturing Pathway**. **Cybersecurity** warranted a unique pathway within IT/IS because of San Antonio's competitive niche as one of three American cities with a fast-emerging, yet poorly documented, cybersecurity ecosystem; however, it is still a part of the larger IT ecosystem.

Career pathways are designed from the ground up, with attention to foundational and essential skills at the entry level or in the early stages of the ladder. They also offer multiple entry and exit points, with the intent being that those who seek skills and a job in a pathway can do so while intentionally climbing an explicit career ladder.

Building on these career pathway documents, the Task Force recommends the following:

1. Embed career information into college advising; and
2. Align the messaging of K-12, higher education, workforce and community-based organizations, so that multiple audiences receive the same information about high-demand occupations and key entry points.

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[15] Task Force Goals 3-8.
[16] Task Force Goals 3-8.

City & County Recommendations

The Task Force, with specific focus on target populations, recommends the following for City and County departments:

1. Continued or expanded investment in programs with a proven track record - provided they meet outcome expectations and align with career pathways - such as Goodwill Industries and Project Quest. (It also may be worth setting aside or allocating additional public or private resources to identify new programs to fill current gaps or challenge successful programs to scale.)

2. To streamline and coordinate efforts focused on these populations, explore a local affiliation with **The Graduate! Network,** which offers turnkey solutions to advising adult learners as part of a national network.
   - Increased career advising will require a centralized location or multiple locations, as well as an outreach campaign. Models of such campaigns include Louisville's **Degrees at Work** and Houston's **Upskill Houston.**
   - Ample opportunities exist to build on existing assets such as cafécollege, local workforce centers and libraries, Project Quest's highly developed career advising tools, as well as call center resources like United Way's 211 or H-E-B's call center.

CONCLUSION

Although San Antonio's most prominent and best-recognized economic building blocks – military and tourism – often come to mind as major economic drivers, it is important to think about these targeted industries and where we have potential to grow even further. San Antonio is home to one of the nation's oldest and largest contract research institutions, inventors of the first stent and personal computers, and is the business service leader in cloud computing. Additionally, San Antonio is one of only a handful of cities in the country to have developed a strong presence in cybersecurity.

UTSA is ranked #1 for cybersecurity courses and degree programs.

San Antonio ranks as the #2 Hub for cybersecurity (just behind Washington DC).

Additionally, San Antonio is poised to benefit from a wide array of community assets, in addition to the great strides made by industry. Not only does our city include a Hispanic-majority population, but we also have the largest Hispanic population of any place in the U.S. with a Hispanic-majority population.[17] Additionally, both the Texas and U.S. population growth continue to be driven by Hispanics. According to the Pew Charitable Trusts, that growth, combined with the fact that in Texas and 24 other states whites are at least twice as likely as Hispanics to have college degrees, more industry and educational leaders are beginning to sound the alarm that this gap presents serious missed opportunity in an economy generating more jobs for educated workers and fewer jobs for high school graduates.[18]

While this growing and diverse population poses to serve as an important economic asset, rising income inequality and gaps in health, etc. as well as gaps in health, income, employment, and education present themselves as barriers to fully maximizing this opportunity. Workers of color, for example, consistently earn lower wages and are more likely to be unemployed than their white counterparts. Nationally, full time workers of color earn 23% less than their white counterparts.[19] Further, if people of color had earned the same as their white counterparts in 2012, the national GPD would have been $2.1 trillion higher. The high number of adult workers in low wage jobs represents an unrealized asset, particularly if a systematic approach can reduce barriers to upward mobility.

Moreover, San Antonio is home to many higher education institutions, including the rapidly-growing University of Texas at San Antonio, the University of Texas Health Science Center, the new and expanding Texas A&M University San Antonio, several well-regarded private universities, and the five community colleges of the Alamo Colleges. In fact, as of Fall 2015, there will be an estimated 71,413 students enrolled in local institutions.[20z]

Implementing the Talent Pipeline Task Force recommendations will take resources and a shared commitment to making progress. It will require industry leadership, capitalizing on existing assets, and harnessing the spirit of cooperation that makes San Antonio strong. It is the only path forward if San Antonio is to compete effectively in a global economy reliant on the skills and knowledge necessary for the 21st century.

[17] 2010 Census.

[18] **Hispanics and Education: A Texas-Sized Challenges for State,** January 29, 2015.

[19] **National Equity Atlas**, 2014.

[20] Lumina: National Student Clearinghouse Research Center, Fall Current Term Enrollment Estimates, 2015.

Healthcare & Biosciences Industry Report

Healthcare & Biosciences

INDUSTRY BACKGROUND

The following presents an overview of the healthcare and biosciences industries in San Antonio. The graph in Figure 1 shows the average earnings versus the national location quotient[21].

Figure 1
Selected Industries in San Antonio Metropolitan Statistical Area (MSA)
Bubble Size Correlates to Number of 2014 Jobs
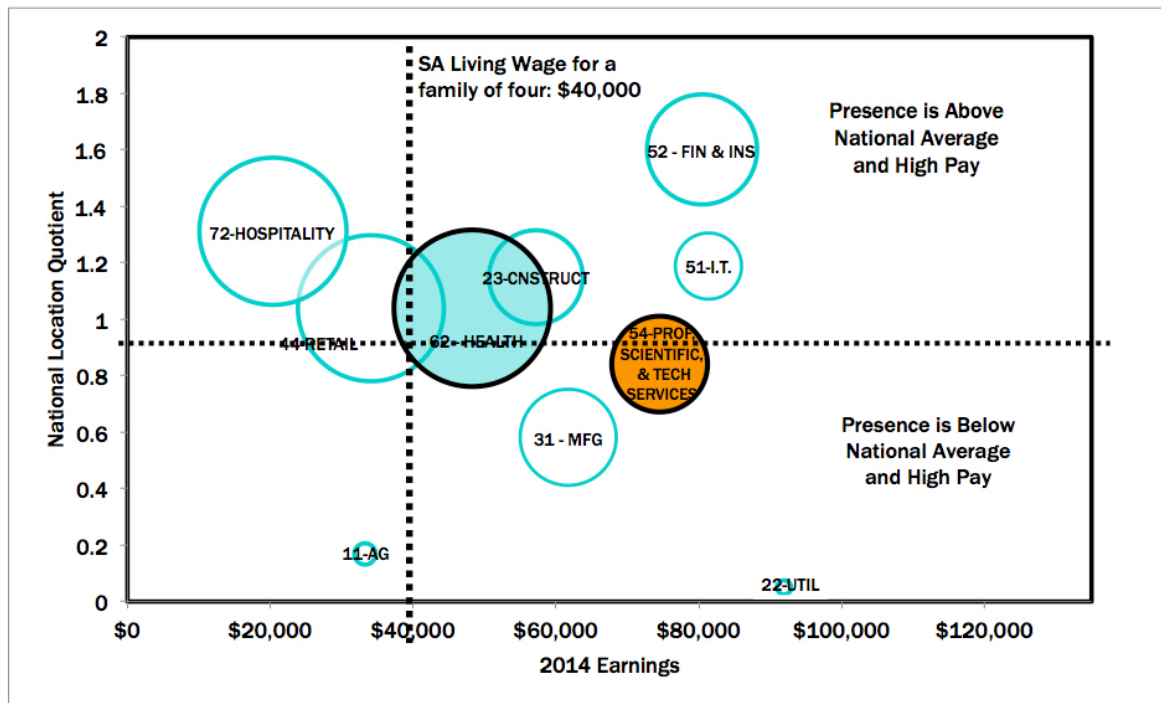
In Figure 1, bubble size corresponds to the number of people employed in the industry. Healthcare and biosciences, two separate but related industries, have a dominant presence in San Antonio. About 102,503 people worked in healthcare and another 7,691 in biosciences, which includes pharmaceutical and medicine manufacturing, medical equipment and supplies manufacturing, scientific research

and development services, in 2014. Healthcare is San Antonio's largest industry, and pays high wages relative to San Antonio and about average compared to the nation. Professional, scientific, and technical services—which captures the biosciences field but includes other research professions as well—are also high paying relative to San Antonio, though pay less than the national average. In 2014,

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[21] Location quotient is an economic term used to describe the concentration of an industry in a particular geographic area. For example, Silicon Valley would have a very high location quotient for information technology. Anything above one generally implies a concentrated industry that is exporting products and/or services. The higher the location quotient is above one, the more the industry is considered a competitive advantage.

the 110,192 healthcare and biosciences workers received an average of $45,236 in wages, salaries, and propriertor earnings, compared to San Antonio's average of $43,256.[22]

THE CASE FOR INDUSTRY GROWTH

Declining Research Advantage
San Antonio is currently experiencing a declining advantage in scientific research and development, which includes biotechnology and medical research. Though the smaller of these two interconnected industries, it offers significant innovation and startup business potential (Figure 2).

In 2003, San Antonio was significantly outpacing the nation: the city employed 1.5 times the national

average workforce in this sector, indicating a competitive advantage in scientific research. Ten years later, San Antonio still outpaces the nation, but the research and development sector has lost its edge. This change speaks to the need to continue to grow this workforce to maintain San Antonio's research advantage.

Some argue that this could be attributed to a decline in federal and philanthropic funding for scientific research. However, these numbers look at how much San Antonio's research grants are declining compared to the national average. If San Antonio were losing research dollars at a constant/equal rate to the national average, the location quotient of 1.53 would be unchanged over time.

Figure 2
Scientific Research and Development Services Industry Concentration, 2003-2013
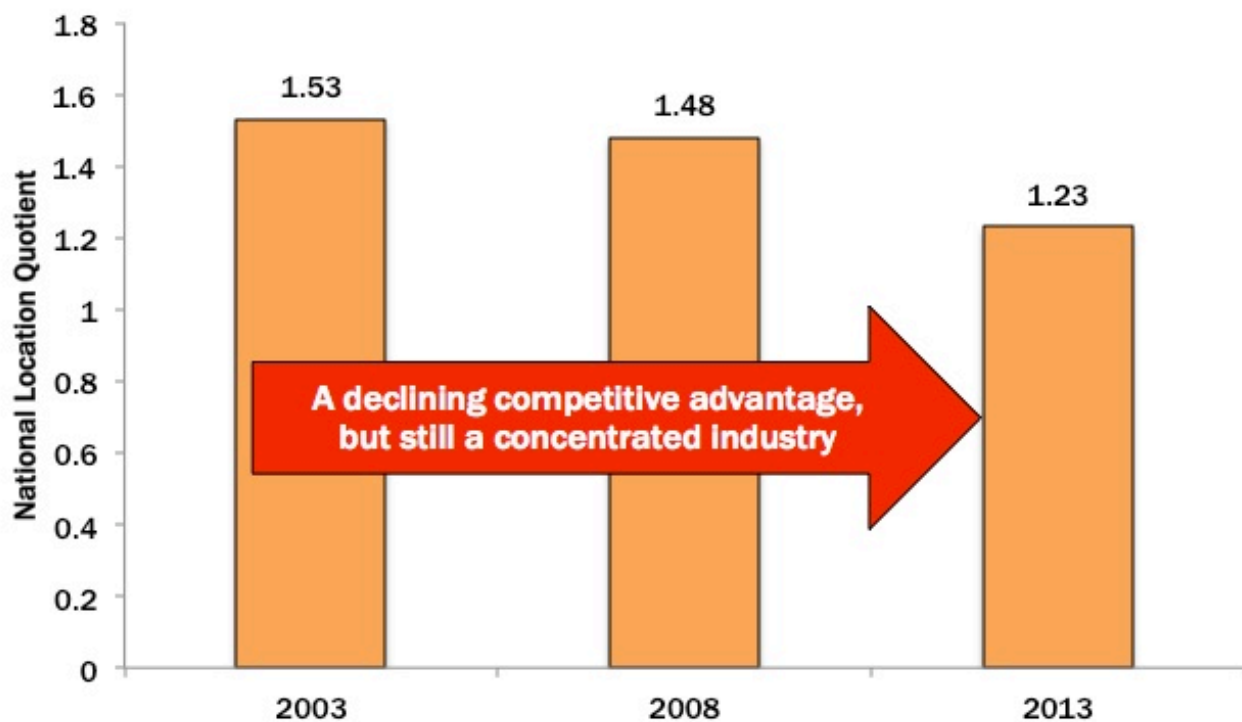
This report only addresses workforce development as a component of economic development. Recognition of the important economic contribution of the biomedical sector led to the formation of BioMedSA. More recently, in June 2015, the San Antonio Medical Foundation released **this report** offering a set of strategies to ensure that San Antonio retains its competitive edge in this important 21st Century sector.

[22] EMSI 2014 San Antonio Data.
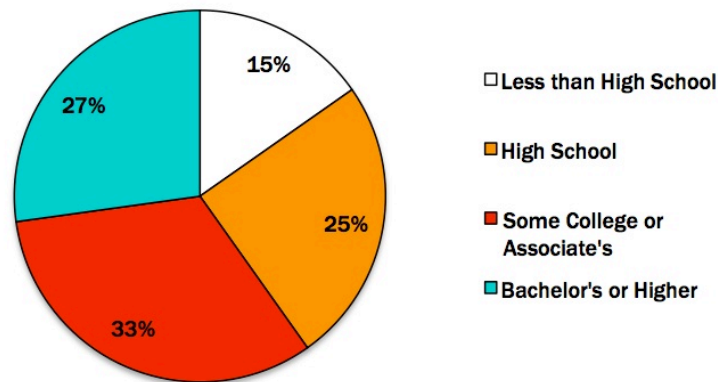
15

MIDDLE SKILLS JOB GROWTH

Middle skill jobs, typically defined as those requiring more than a high school diploma and less than a bachelor's degree are paying high wages in both healthcare and biosciences (Figure 3), with more jobs continuing to grow. Given San Antonio's workforce currently having lower levels of education (Figure 4), these jobs offer the promise of a **career pathway** for our current labor force.

Figure 3
Examples of Local Healthcare and Biosciences Jobs That Require Middle Skills

Occupation	Required Education	2014 Employment	2014 Median Earnings
Licensed Practical/ Vocational Nurse	Certificate	7,355	$42,910
Radiologic Technologists	Associate's Degree	1053	$52,790
Respiratory Therapist	Associate's Degree	887	$53,893

Source: EMSI 2014 San Antonio Data

Figure 4
San Antonio's Incumbent Labor Force: Educational Attainment for Adults 25-64

- Less than High School — 15%
- High School — 25%
- Some College or Associate's — 33%
- Bachelor's or Higher — 27%

Source: U.S. Census Bureau, 2009-2013 American Community Survey 5-Year Estimates for Bexar County.

HEALTHCARE & BIOSCIENCES: DEFINITIONS

Labor Market Definitions

Because the healthcare and research sectors employ many diverse skill sets (ranging from maintenance workers to computer programmers), job postings in this industry are abundant. For the purpose of this analysis, only specific occupations were selected to include those requiring specialized health and science skill sets. Included occupations were also identified as important by local industry partners. Occupations primarily come from the following industries (NAICS code in parentheses): Ambulatory Health Care Services (621); Hospitals (622); Nursing and Residential Care Facilities (623); Pharmaceutical and Medicine Manufacturing (3254); Medical Equipment and Supplies Manufacturing (3391); and Scientific Research and Development Services (5417). Altogether, 55 occupations were selected for this report. A complete list can be found in **Healthcare & Biosciences Appendix A.**

Postsecondary Award Alignment

Specific postsecondary awards were selected to align with each of the 55 occupations to identify gaps between industry needs and local talent production. In many cases, healthcare degrees provide a clear one-to-one mapping with job titles. The data source for all degree information is the National Center for Education Statistics's IPEDS data site. Most awards were classified under Health Professions and Related Programs; Biological and Biomedical Sciences; and Engineering Technologies and Engineering-related Fields. A complete list of chosen postsecondary awards is available in **Healthcare & Biosciences Appendix B.**

ESTIMATED PIPELINE GAPS (FULL YEAR 2013)

Educational Pipeline Data

The most recent postsecondary completion data available is from the 2012-2013 school year. In San Antonio, students earned 5,739 postsecondary awards aligned with target occupations. Nearly three-fourths of awards were at the certificate (51%) or associate's level (21%).
The most popular certificate completion was in Medical/Clinical Assistant, with 1,571 students earning awards. Registered Nursing was the most popular award at the associate's level (803 completions), and second-most popular bachelor's degree (409 completions). Similarly, Family Practice Nursing was the most awarded master's degree (50 completions). Biology was the most popular bachelor's degree overall, with 487 completions. Finally, 226 students were awarded a doctor of medicine.

Figure 5
Postsecondary Awards in Targeted Healthcare and Biosciences Areas, 2012-2013
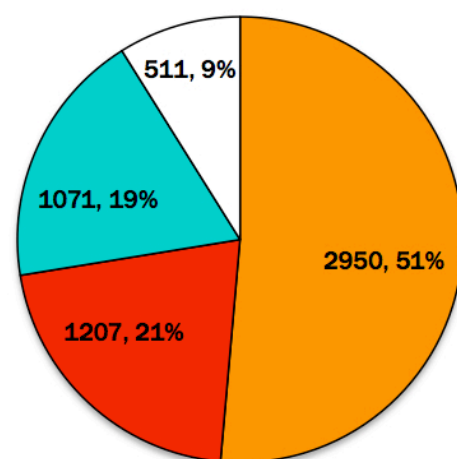

Source: IPEDS, San Antonio Postsecondary Completions 2012-2013

Estimated Gaps

In 2013, for every one Healthcare and Biosciences graduate, there were nearly two posted job openings. Registered Nursing shows the greatest need: firms posted 2,344 jobs for only 1,212 newly credentialed graduates, a gap of 1,122 workers likely filled by importing talent. Companies also likely imported talent for Nurse Practicioners, Physician's Assistants, Licensed Vocational Nurses, Medical Assistants, Patient Care Assistants, and Surgical Technicians.

Figure 6
**Graduates vs. Job Postings in Targeted Healthcare Occupations, 2013**
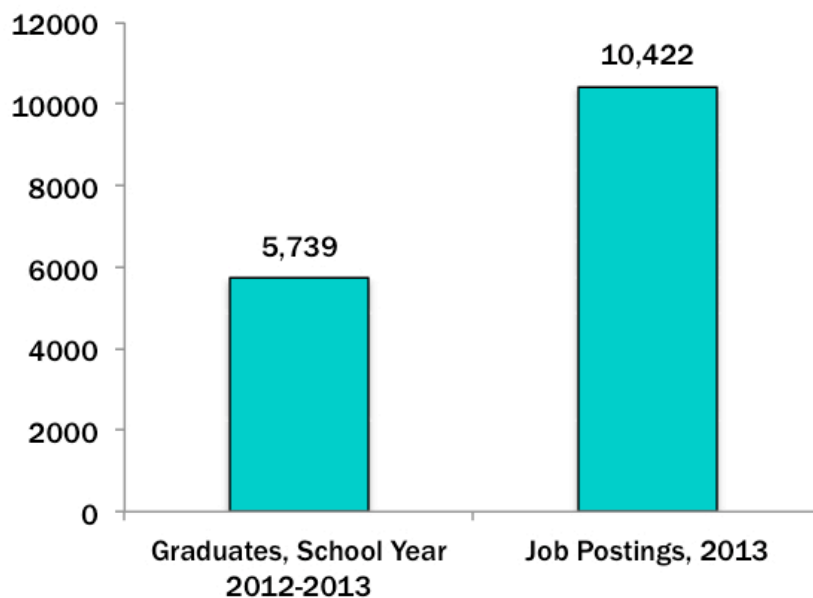
Source: SA2020 Analysis of Burning Glass, 2013.

CURRENT DEMAND

Most Demanded Occupations

Nursing—including Registered Nurses, Nursing Assistants, Critical Care Nurses, Vocational Nurses, and Medical Assistants—represents the most posted healthcare job family during January 2014-April 2015. Patient Care Assistants and Pharmacy Technicians were also frequently posted during the same time period. Figure 7 lists the ten most frequently posted job openings, showing the full year 2014 and the first four months of 2015. Because the healthcare sector is significantly larger than biosciences, the job postings and employers dwarf biosciences, but that should not diminish their complementary relationship or relative importance.

Figure 7
**Top 10 Most Posted Job Titles in Healthcare & Biosciences, January 2014-April 2015**
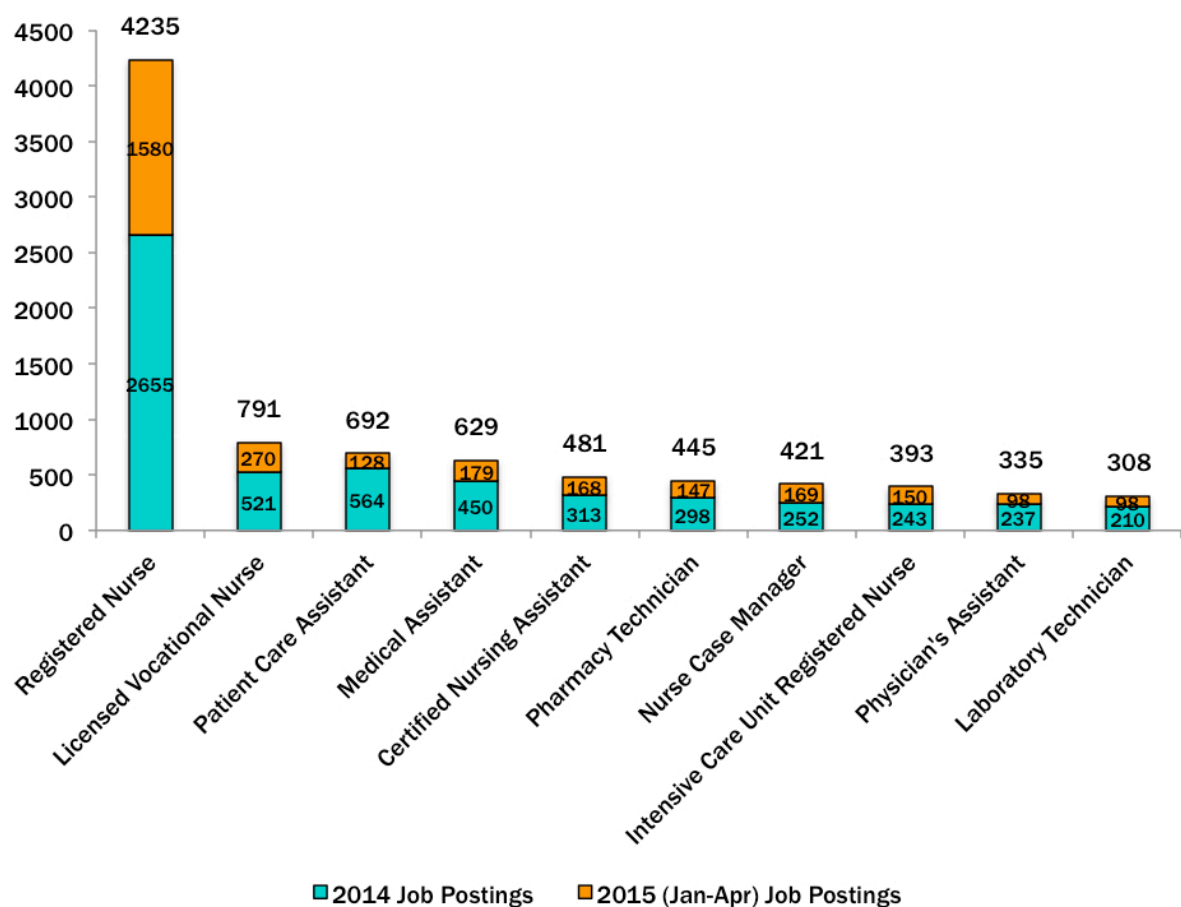
Source: SA2020 Analysis of Burning Glass, 2013.

Top Area Employers

Hospitals posted the most job openings in San Antonio during the past year, representing six of the top ten employers ranked by job postings. Hospital Corporation of America, which operates Methodist Healthcare System, posted the most job openings (2,349) from January 2014-April 2015. Methodist Healthcare System itself posted 1,406 job openings and CHRISTUS Health 1,018 openings. Two health insurance groups (UnitedHealth Group and Humana) and two military affiliated companies (the Department of Veterans Affairs and the US Army Medical Corps) rounded out the top ten employers with the most job postings.

Figure 8
Top 10 Healthcare & Biosciences Employers by Job Postings,
**January 2014-April 2015**
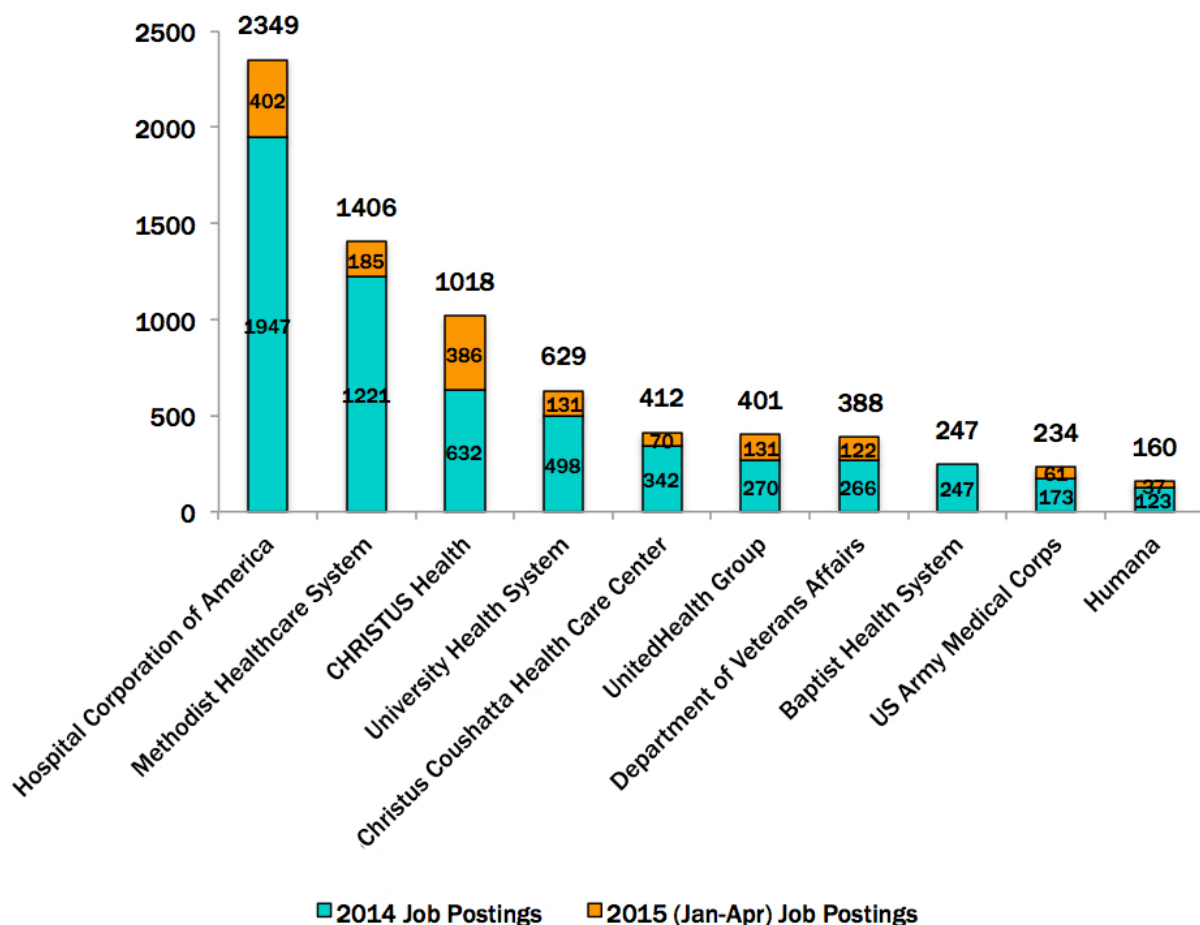
Source: SA2020 Analysis of Burning Glass, 2013.

Demanded By Education & Experience

From January-April 2015, the healthcare industry posted 6,654 open positions in targeted occupation families (Figure 9). Burning Glass listed education and experience requirements for 4,531 postings, or 68 percent of all listed jobs. Consequently, analysis of education and experience requirements is biased towards these 68 percent of postings and may not reflect the actual demand in San Antonio. Employers who specify educational requirements are most likely to prefer bachelor's degrees (32 percent), with associate's degrees (27 percent) and high school or vocational training (28 percent) not far behind. More than half of all postings listed experience requirements of less than two years. Very few jobs (10 percent) required more than five years of experience. Figure 9 shows the educational and experience requirements of job postings.

Figure 9
Job Openings by Education and Experience,
January-April 2015
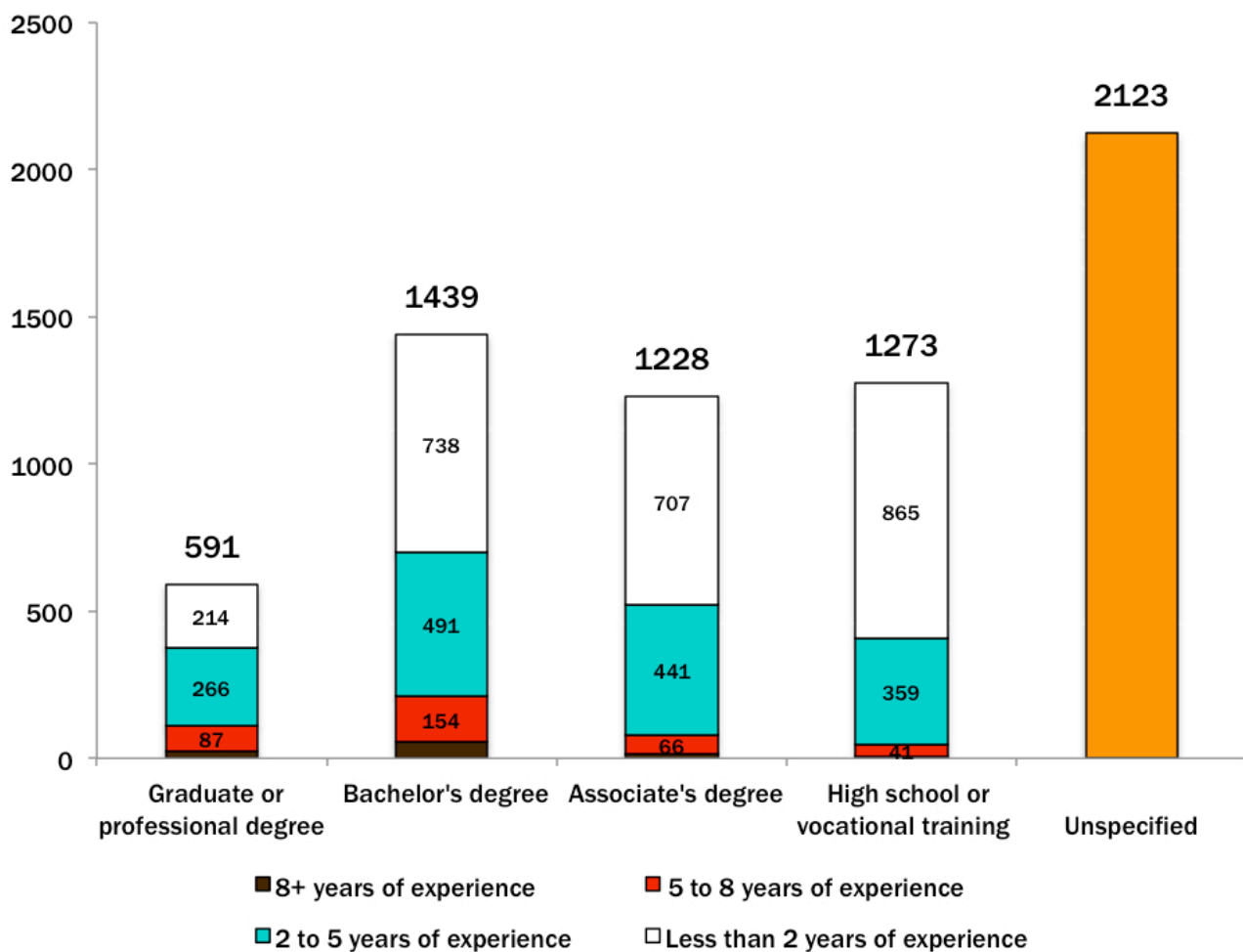
Source: SA2020 Analysis of Burning Glass, 2013.

Most Demanded Skills

Patient Care and Treatment Planning are the most requested skills in San Antonio's healthcare industry. Clinical experience is also extremely important to many employers. During the first four months of 2015, nearly 30 percent of job postings with specified skill sets listed Patient Care; 15 percent listed Treatment Planning; and 10 percent listed Patient Education and Instruction. Figure 10 shows the most requested skills by job postings for January-April of 2015.

Figure 10
Most Requested Skills, January-April 2015

Skill	Value
Patient Care	1,844
Treatment Planning	939
Clinical Experience	783
Patient Education & Instruction	774
Advanced Cardiac Life Support (ACLS)	759
Medication Administration	574
Case Management	465
Neonatal Intensive Care Unit (NICU)	399
Patient Direction	386
Pediatrics	383
Pediatric Intensive Care Unit (PICU)	372
Surgery	368
Screening	363
Patient Transportation & Transfer	327
Collaboration	324

Source: SA2020 Analysis of Burning Glass, 2013.

Healthcare & Biosciences Appendix A
Occupations
Classified by Burning Glass

Acute Care Nurses
Anesthesiologist Assistants
Anesthesiologists
Audiologists
Bioinformatics Scientists
Biological Technicians
Biologists
Cardiovascular Technologists and Technicians
Clinical Nurse Specialists
Compliance Managers
Critical Care Nurses
Emergency Medical Technicians and Paramedics
Epidemiologists
Histotechnologists and Histologic Technicians
Home Health Aides
Hospitalists
Internists, General
Licensed Practical and Licensed Vocational Nurses
Magnetic Resonance Imaging Technologists
Manufacturing Engineers
Medical and Clinical Laboratory Technicians
Medical and Clinical Laboratory Technologists
Medical Assistants
Medical Equipment Preparers
Medical Records and Health Information Technicians
Medical Scientists, Except Epidemiologists
Medical Transcriptionists
Midwives
Nurse Anesthetists
Nurse Midwives
Nurse Practitioners
Nursing Assistants
Obstetricians and Gynecologists
Occupational Health and Safety Specialists
Occupational Health and Safety Technicians

Ophthalmic Medical Technicians
Ophthalmic Medical Technologists
Ophthalmologists
Pathologists
Pharmacy Aides
Pharmacy Technicians
Phlebotomists
Physician Assistants
Quality Control Systems Managers
Radiation Therapists
Radiologic Technicians
Radiologic Technologists
Registered Nurses
Regulatory Affairs Managers
Respiratory Therapists
Respiratory Therapy Technicians
Surgeons
Surgical Assistants
Surgical Technologists
Validation Engineers

Healthcare & Biosciences Appendix B
Postsecondary Degrees

Adult Health Nurse/Nursing
Anesthesiologist Assistant
Audiology/Audiologist
Biochemistry Biophysics and Molecular Biology
Biological and Biomedical Sciences Other
Biology General
Biology Technician/Biotechnology Laboratory Technician
Biomathematics Bioinformatics and Computational Biology
Cardiovascular Technology/Technologist
Cell/Cellular Biology and Anatomical Sciences
Clinical Laboratory Science/Medical Technology/ Technologist
Clinical Nurse Leader
Clinical Nurse Specialist
Clinical/Medical Laboratory Technician
Critical Care Nursing
Electromechanical Technology/Electromechanical Engineering Technology
Emergency Medical Technology/Technician (EMT Paramedic)
Emergency Room/Trauma Nursing
Engineering General
Engineering/Industrial Management
Epidemiology
Family Practice Nurse/Nursing
Genetics
Geriatric Nurse/Nursing
Health Aide
Health Information/Medical Records Administration/ Administrator
Health Information/Medical Records Technology/ Technician
Health/Health Care Administration/Management
Histologic Technician
Histologic Technology/Histotechnologist
Hospital and Health Care Facilities Administration/ Management
Instrumentation Technology/Technician
Licensed Practical/Vocational Nurse Training
Magnetic Resonance Imaging (MRI
Manufacturing Engineering
Maternal/Child Health and Neonatal Nurse/Nursing

Medical Assistant
Medical Radiologic Technology/Science - Radiation Therapist
Medical Scientist
Medical Transcription/Transcriptionist
Medicine
Microbiological Sciences and Immunology
Molecular Medicine
Neurobiology and Neurosciences
Nurse Anesthetist
Nurse Midwife/Nursing Midwifery
Nursing Administration
Nursing Assistant/Aide and Patient Care Assistant/Aide
Nursing Education
Nursing Practice
Nursing Science
Occupational and Environmental Health Nursing
Ophthalmic Laboratory Technology/Technician
Ophthalmic Technician/Technologist
Palliative Care Nursing
Pathology/Pathologist Assistant
Pediatric Nurse/Nursing
Perioperative/Operating Room and Surgical Nurse/ Nursing
Pharmacy Technician/Assistant
Phlebotomy Technician/Phlebotomist
Physician Assistant
Physiology Pathology and Related Sciences
Practical Nursing Vocational Nursing and Nursing Assistants Other
Psychiatric/Mental Health Nurse/Nursing
Public Health/Community Nurse/Nursing
Quality Control and Safety Technologies/Technicians
Registered Nursing Nursing Administration Nursing Research and Clinical Nursing
Registered Nursing/Registered Nurse
Respiratory Care Therapy/Therapist
Respiratory Therapy Technician/Assistant
Surgical Technology/Technologist
Women's Health Nurse/Nursing

Information Technology & Information Security Industry Report

Information Technology & Information Security

INDUSTRY BACKGROUND

The following presents an overview of the information technology (IT) and information security (IS) industry in San Antonio. The graph in Figure 1 shows the average industry earnings versus the national location quotient.[23]

Figure 1
Selected Industries in San Antonio Metropolitan Statistical Area (MSA)
Bubble Size Correlates to Number of 2014 Jobs
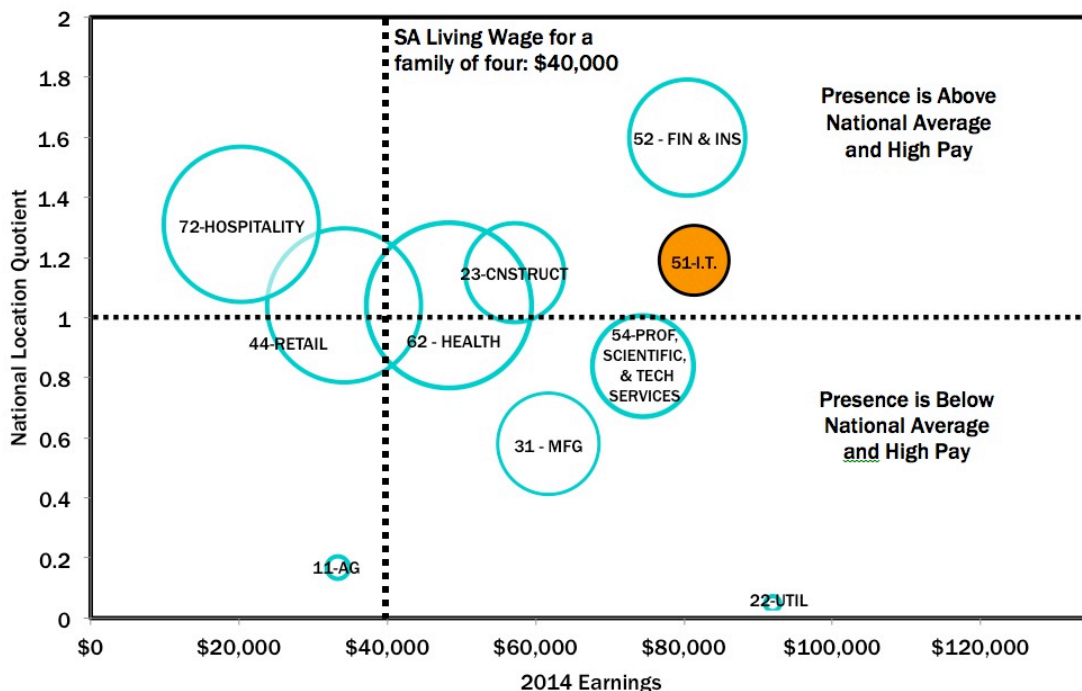
In Figure 1, bubble size corresponds to the number of people employed in the industry. San Antonio's IT workforce is relatively small, but high-paying. It is also important to note that computer and technical skills permeate all industries. This figure simply highlights businesses whose sole purpose is to provide IT services. Most significantly, San Antonio slightly outpaces the nation in its proportion of

workers employed in the IT industry. In 2014, San Antonio's 16,290 IT workers received an average of $78,744 in wages, salaries, and proprietor earnings, compared to San Antonio's average of $43,256[24].

[23] Location quotient is an economic term used to describe the concentration of an industry in a particular geographic area. For example, Silicon Valley would have a very high location quotient for information technology. Anything above one generally implies a concentrated industry that is exporting products and/or services. The higher the location quotient is above one, the more the industry is considered a competitive advantage.
[24] EMSI 2014 San Antonio Data.

THE CASE FOR INDUSTRY GROWTH

An Increasing Advantage in Data Processing and Hosting

Within IT, the most prominent success story is in Data Processing and Hosting. In 2013, San Antonio employed four times the national average in this industry — a competitive advantage that has nearly doubled in ten years. Rackspace is clearly the anchor to this important, export-oriented industry for our economy.
IT/IS Career Pathway
Cybersecurity Career Pathway

Figure 2
Data Processing and Hosting Industry Concentration, 2003-2013
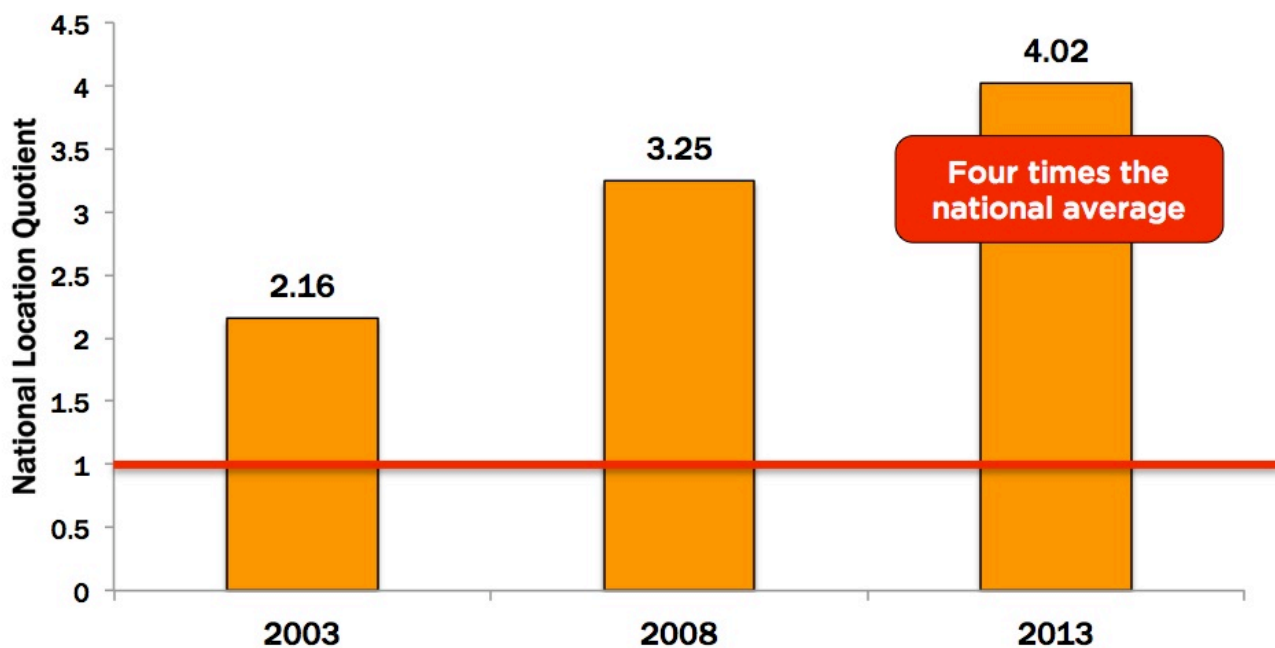

MIDDLE SKILLS JOB GROWTH

Middle skill jobs, typically defined as those requiring more than a high school diploma and less than a bachelor's degree are paying high wages in this sector, with more jobs continuing to grow. Given San Antonio's current workforce with generally lower levels of education, these jobs promise living wages for the incumbent labor force.

Figure 3
Examples of Local IT Jobs That Require Middle Skills

Occupation	Required Education	2014 Employment	2014 Job Postings	2014 Median Earnings
Computer User Support Specialists	Certificate	1,051	688	$47,237
Computer Network Support Specialists	Associate's Degree	467	63	$55,702
Web Developers	Certificate	316	315	$53,872

Source: EMSI 2014 San Antonio Data

Figure 4
San Antonio's Incumbent Labor Force: Educational Attainment for Adults 25-64
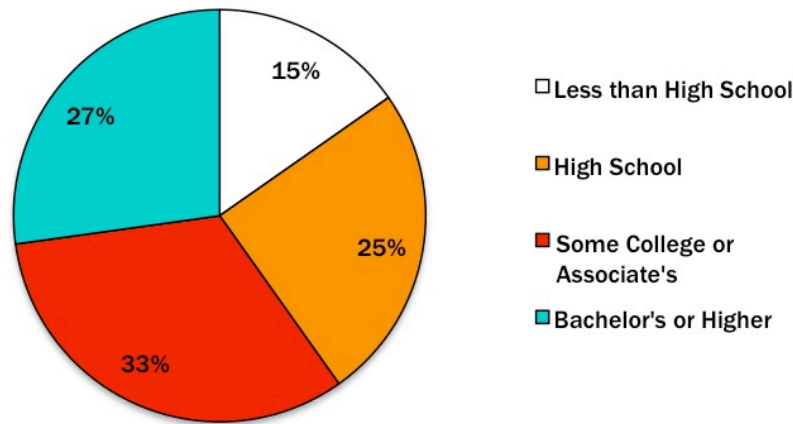
Source: U.S. Census Bureau, 2009-2013 American Community Survey 5-Year Estimates for Bexar County.

INFORMATION TECHNOLOGY & SECURITY: DEFINITIONS

Labor Market Definitions

Every industry—from retail to manufacturing to insurance to healthcare—employs skilled technology workers to some extent. Because IT and IS jobs span industries, this report focuses on Burning Glass's specific Computer and Mathematical job family. This job family is comprised of 35 O*NET occupation codes and includes jobs essential to computer programming, including Software Developers, Database Administrators, Computer Systems Engineers/Architects, and Business Intelligence Analysts. A complete list of jobs included in this analysis can be found in **IT/IS Appendix A**.

Postsecondary Award Alignment

Specific postsecondary awards were selected to align with the Computer and Mathematical job family occupations to identify gaps between industry needs and local talent production. The data source for all degree information is the National Center for Education Statistics's IPEDS data site. Data is for the most recent school year, 2012-2013. Most awards were classified under Computer and Information Sciences. A complete list of chosen postsecondary awards is available in **IT/IS Appendix B**.

ESTIMATED PIPELINE GAPS
(FULL YEAR 2013)

Educational Pipeline Data

Figure 5
Postsecondary Awards in Targeted
IT Areas, 2012-2013

- Certificates: 184, 19%
- Associates: 341, 34%
- Bachelors: 321, 32%
- Masters+: 147, 15%
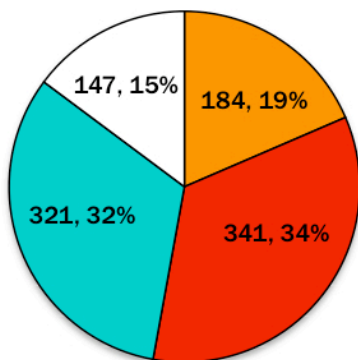
□ Certificates ■ Associates ■ Bachelors □ Masters+

*Source: IPEDS, San Antonio Postsecondary Completions 2012-2013*

The most recent postsecondary completion data available is from the 2012-2013 school year. In San Antonio, students earned 993 postsecondary awards. Over half of the awards were at the certificate (19%) or associate's level (34%). The most popular certificate and associate's degree was in Computer Systems Networking and Telecommunications: 59 students earned certificates, and 166 earned associate's degrees. At the higher levels, Computer and Information Sciences, General, was the most common completion: 112 students earned bachelor's degrees, and 55 earned master's degrees in this area.

Estimated Gaps

In 2013, for every one IT college graduate, there were nearly ten posted job openings. Software Developers, Applications show the greatest need. Firms posted 2,212 jobs for only 349 newly credentialed graduates, a gap of 1,863 workers likely filled by importing talent. Companies also likely imported talent for Computer Systems Analysts and Systems Administrations, which draw from similar talent pools: 1,797 job openings were posted against 439 local graduates, a gap of 1,358 workers
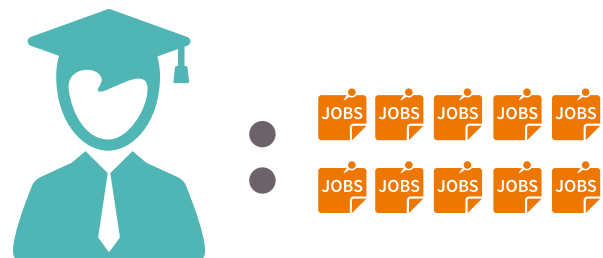
**Graduates vs. Job Postings in Targeted IT/IS Job Families, 2013**

Source: SA2020 Analysis of Burning Glass, 2013.

29
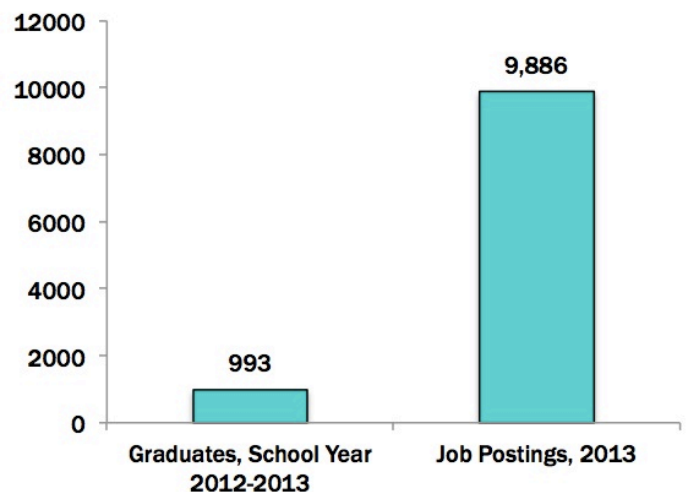
CURRENT DEMAND

Most Demanded Occupations

Software Developers were the most demanded jobs during January 2014-April 2015, with employers posting more than 3,000 openings. Computer Systems Analysts and Business Intelligence Analysts were also frequently posted during the same time period. Figure 7 lists the ten most frequently posted job openings, showing the full year 2014 and the first four months of 2015.

Figure 7
Top 10 IT Occupations by Job Postings
January 2014-April 2015
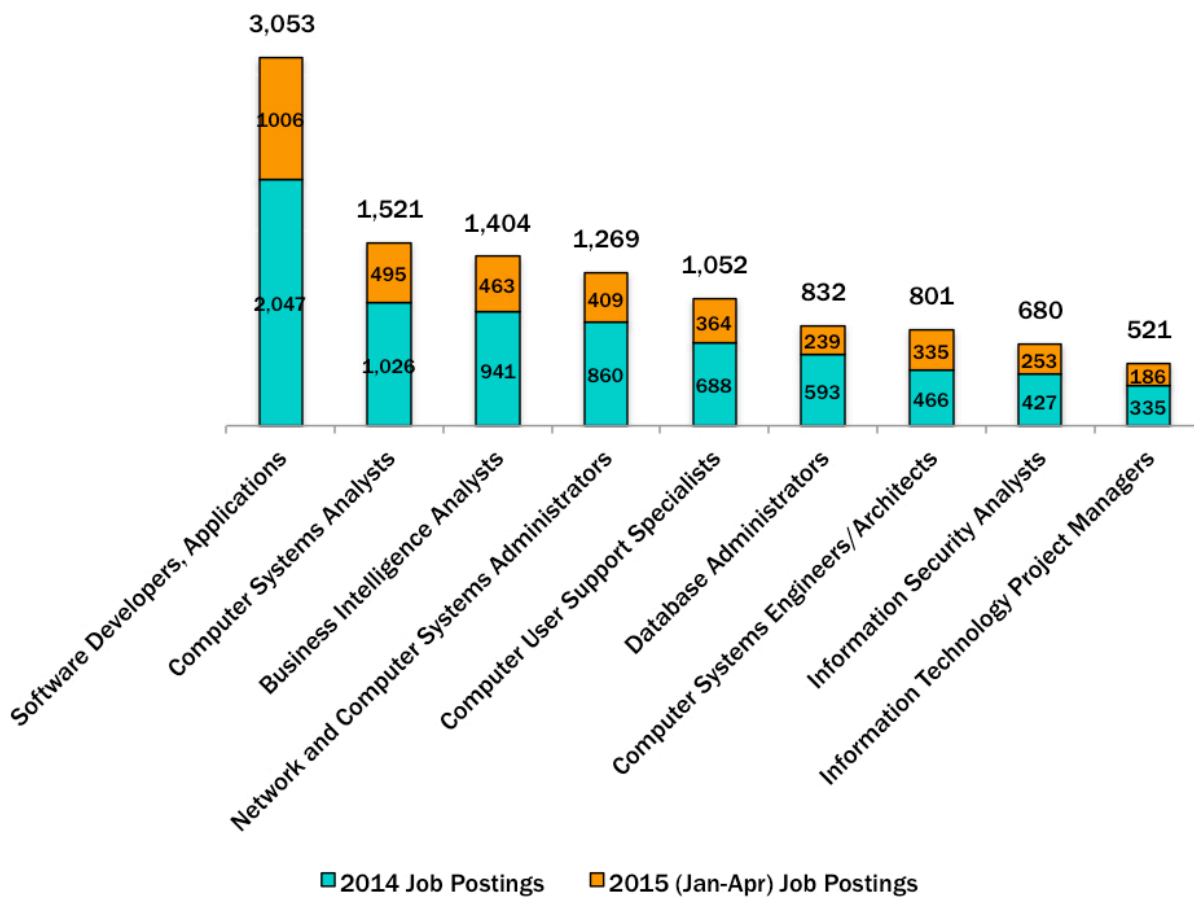
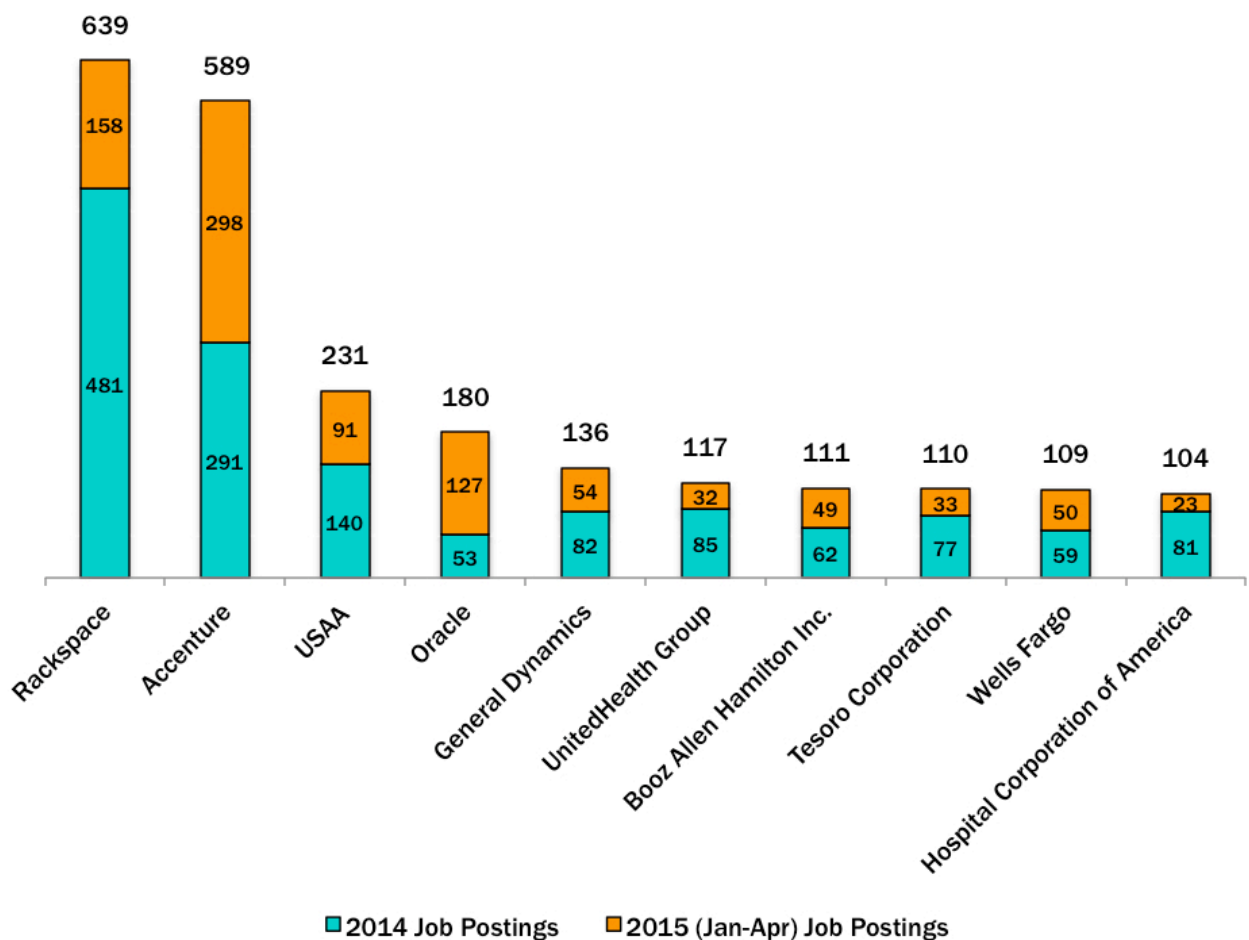*Source: SA2020 Analysis of Burning Glass, 2013.*

Top Area Employers

Rackspace, a managed cloud computing company, posted the most IT job openings (481) during 2014, followed by Accenture, a management consulting, technology, and outsourcing company, with 291. USAA, which offers insurance and financial services, came in a distant third with 120 job postings in 2014. During the first four months of 2015, Accenture held the most job openings with 298 job openings—more than its previous twelve-month demand. Strong 2015 demand indicates IT continues to be an employer need in San Antonio.

Photo Courtesy Rackspace

Figure 8
Top 10 IT Employers by Job Postings,
January 2014-April 2015

■ 2014 Job Postings   ■ 2015 (Jan-Apr) Job Postings

Source: SA2020 Analysis of Burning Glass, 2013.

Demanded By Education & Experience

From January-April 2015, the IT industry posted 4,848 open positions. Burning Glass listed education and experience requirements for 3,150 postings, or 65 percent of all listed jobs. Consequently, analysis of education and experience requirements is biased towards these 65 percent of postings and may not reflect the actual demand in San Antonio. Employers who specify educational requirements are most likely to prefer bachelor's degrees. Only 11 percent of job postings required less than two years of experience, a significant barrier to closing the supply/demand gap. Indeed, more than half of all posted jobs (with specified requirements) sought applicants with 5+ years of experience. Interviews with employers suggests that industry is open to trained workers with less education, creating an opportunity for more tailored, nimble IT training programs such as, but not limited to, Codeup and the Open Cloud Academy. Figure 9 shows the educational and experience requirements of job postings with specified baselines.

Figure 9
Job Openings by Education and Experience,
**January-April 2015**
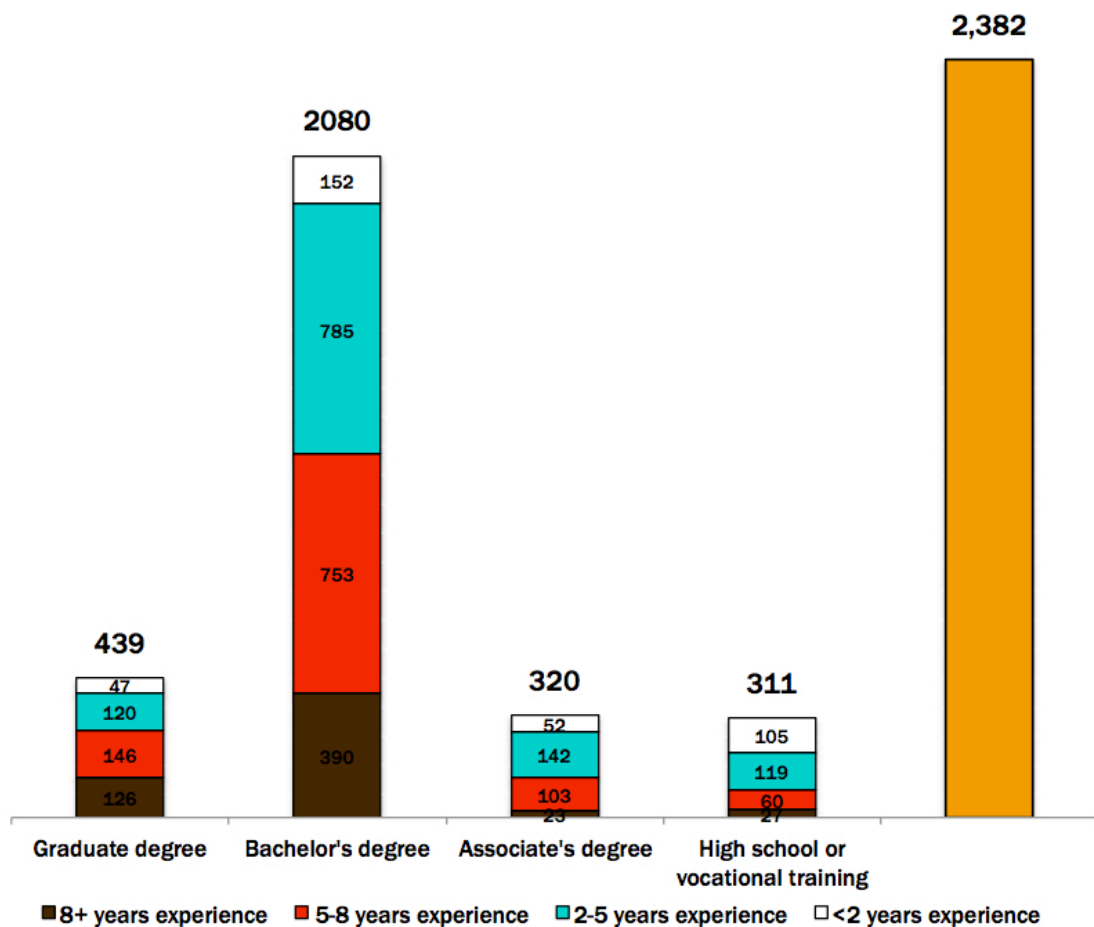
Source: SA2020 Analysis of Burning Glass, 2013.

Most Demanded Skills

As expected, most IT employers request specific programming languages and technical skills from job candidates. SQL, Java, and JavaScript are among the most requested programming languages in San Antonio. LINUX is the most popular operating system request. In more general terms, Technical Support, Business Process, and Software Engineering are also highly important to many employers. Figure 10 shows the most requested skills by job postings for January-April of 2015.

Figure 10
Most Requested Skills, January-April 2015
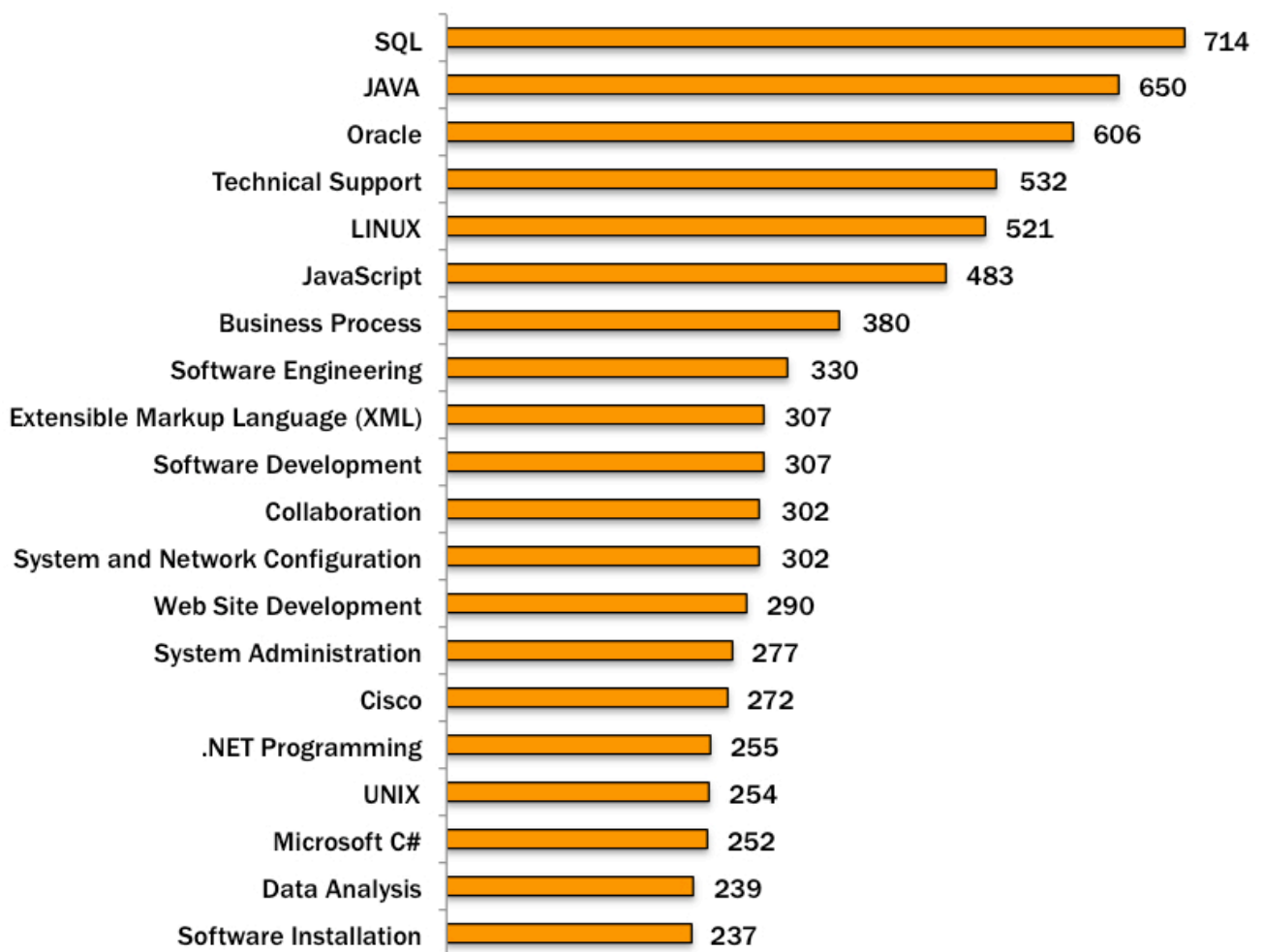
Source: SA2020 Analysis of Burning Glass, 2013.

IT/IS Appendix A

Included Occupation Codes
15-0000 Computer and Mathematical Occupations

15-1111.00	Computer and Information Research Scientists
15-1121.00	Computer Systems Analysts
15-1121.01	Informatics Nurse Specialists
15-1122.00	Information Security Analysts
15-1131.00	Computer Programmers
15-1132.00	Software Developers, Applications
15-1133.00	Software Developers, Systems Software
15-1134.00	Web Developers
15-1141.00	Database Administrators
15-1142.00	Network and Computer Systems Administrators
15-1143.00	Computer Network Architects
15-1143.01	Telecommunications Engineering Specialists
15-1151.00	Computer User Support Specialists
15-1152.00	Computer Network Support Specialists
15-1199.00	Computer Occupations, All Other
15-1199.01	Software Quality Assurance Engineers and Testers
15-1199.02	Computer Systems Engineers/Architects
15-1199.03	Web Administrators
15-1199.04	Geospatial Information Scientists and Technologists
15-1199.05	Geographic Information Systems Technicians
15-1199.06	Database Architects
15-1199.07	Data Warehousing Specialists
15-1199.08	Business Intelligence Analysts
15-1199.09	Information Technology Project Managers
15-1199.10	Search Marketing Strategists
15-1199.11	Video Game Designers
15-1199.12	Document Management Specialists
15-2011.00	Actuaries
15-2021.00	Mathematicians
15-2031.00	Operations Research Analysts
15-2041.00	Statisticians
15-2041.01	Biostatisticians
15-2041.02	Clinical Data Managers
15-2091.00	Mathematical Technicians
15-2099.00	Mathematical Science Occupations, All Other

IT/IS Appendix B
Included Postsecondary Degrees

Computer and Information Sciences General
Artificial Intelligence
Information Technology
Informatics
Computer and Information Sciences Other
Computer Programming/Programmer General
Computer Programming Specific Applications
Computer Programming Vendor/Product
Certification
Computer Programming Other
Data Processing and Data Processing Technology/
Technician
Information Science/Studies
Computer Systems Analysis/Analyst
Data Entry/Microcomputer Applications General
Word Processing
Data Entry/Microcomputer Applications Other
Computer Science
Web Page Digital/Multimedia and Information
Resources Design
Data Modeling/Warehousing and Database
Administration
Computer Graphics
Modeling Virtual Environments and Simulation
Computer Software and Media Applications Other
Computer Systems Networking and
Telecommunications
Network and System Administration/Administrator
System Networking and LAN/WAN Management/
Manager
Computer and Information Systems Security/
Information Assurance
Web/Multimedia Management and Webmaster
Information Technology Project Management
Computer Support Specialist
Computer/Information Technology Services
Administration and Management Other
Computer and Information Sciences and Support

Services Other
Mathematics General
Algebra and Number Theory
Analysis and Functional Analysis
Geometry/Geometric Analysis
Topology and Foundations
Mathematics Other
Applied Mathematics General
Computational Mathematics
Computational and Applied Mathematics
Financial Mathematics
Mathematical Biology
Applied Mathematics Other
Statistics General
Mathematical Statistics and Probability
Mathematics and Statistics
Statistics Other
Mathematics and Statistics Other
Biostatistics
Actuarial Science

Transportation Manufacturing Industry Report

Transportation Manufacturing

INDUSTRY BACKGROUND

The following presents an overview of the manufacturing industry in San Antonio. The graph in Figure 1 shows the average industry earnings versus the national location quotient[25].

Figure 1
Selected Industries in San Antonio Metropolitan Statistical Area (MSA)
Bubble Size Correlates to Number of 2014 Jobs
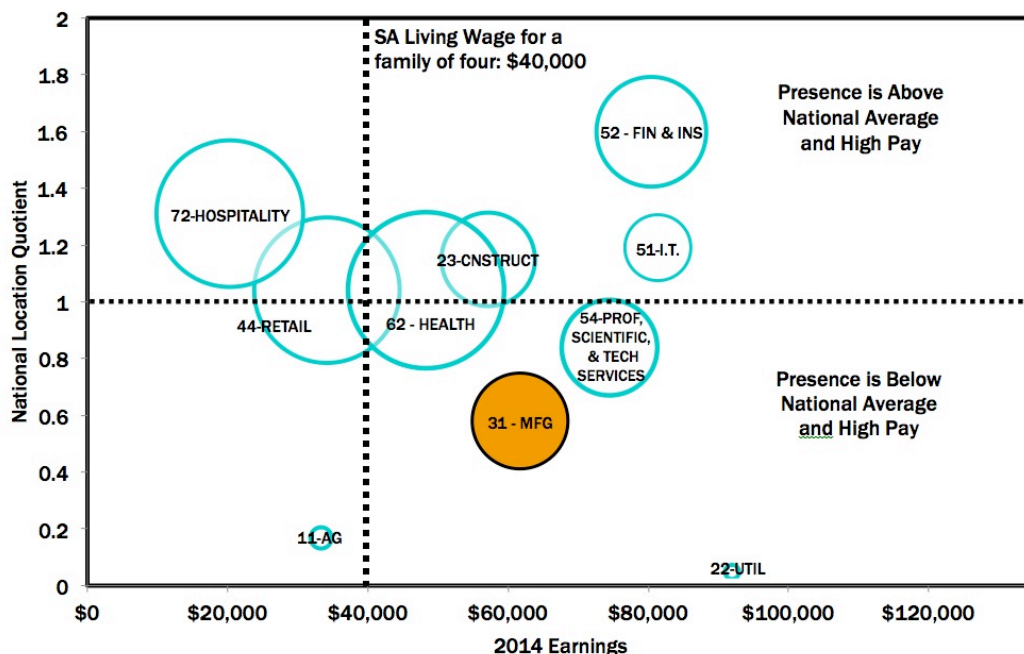
Source: BLS Location Quotient Calculator for San Antonio-New Braunfels MSA, 2013, and EMSI 2014 San Antonio Data. Source: BLS Location Quotient Calculator for San Antonio-New Braunfels MSA, 2013, and EMSI 2014 San Antonio Data.

In Figure 1, bubble size corresponds to the number of people employed in the industry. San Antonio's manufacturing workforce is relatively small, but high-paying. It is also important to note that computer and manufacturing skills permeate many industries. This figure simply highlights businesses whose sole purpose is to provide manufacturing services. San Antonio is below the national average for the proportion of workers employed in the manufacturing industry. In 2014, 45,054 workers were employed by the manufacturing industry. Of these workers, 12,174 were employed in the Talent Pipeline Task Force's specific focus area, transportation manufacturing. Transportation Manufacturing workers received an average of $59,354 in wages, salaries, and proprietor earnings, compared to San Antonio's average of $43,256.[25]

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[25] Location quotient is an economic term used to describe the concentration of an industry in a particular geographic area. For example, Silicon Valley would have a very high location quotient for information technology. Anything above one generally implies a concentrated industry that is exporting products and/or services. The higher the location quotient is above one, the more the industry is considered a competitive advantage.

THE CASE FOR INDUSTRY GROWTH

A Growing Competitive Advantage

One area of strategic growth for San Antonio is in Transportation and Equipment Manufacturing, mainly car parts manufacturing and car parts assembly. In 2003, San Antonio was employing a workforce proportion well below the national average in this industry. By 2013, however, our city's workforce, with Toyota as an anchor employer, had grown to support a newfound competitive advantage. Today, the automotive industry's presence continues to grow. Most recently, the 2014 location quotient was 1.27. As the industry expands, it is important that San Antonio's skilled workforce keeps pace to support this relatively new competitive advantage.

Figure 2
Transportation and Equipment Manufacturing Concentration, 2003-2013
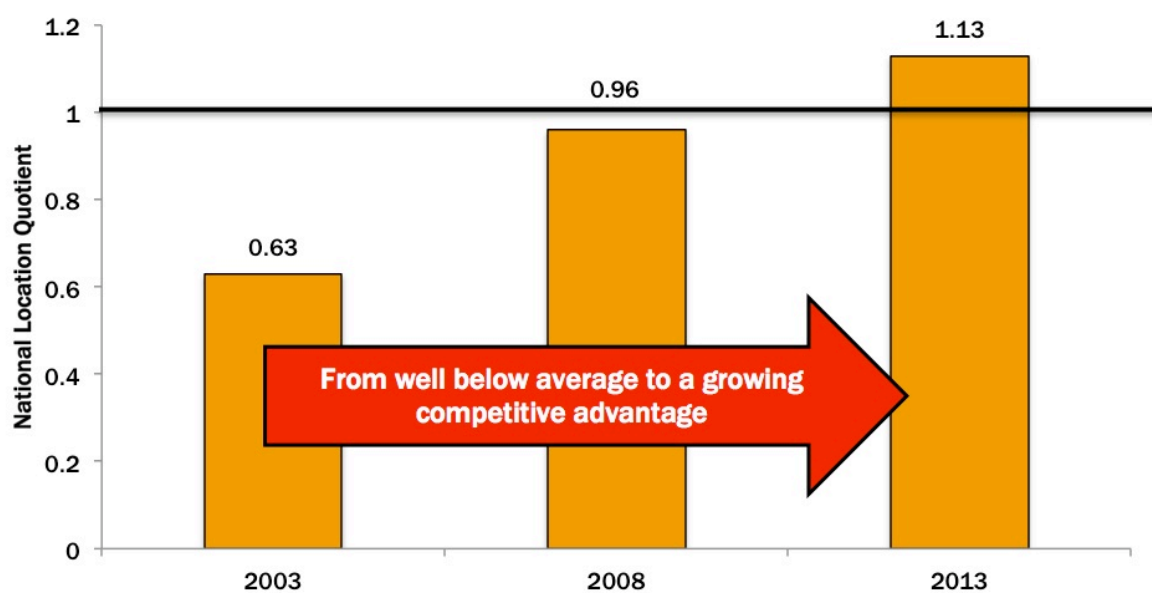
Middle Skills Job Growth

Middle skill jobs, typically defined as those requiring more than a high school diploma and less than a bachelor's degree, are paying high wages in this fast-growing sector. Given the demographics of San Antonio's current population with generally lower levels of education, these jobs promise an entry point into a career ladder that offers progression for the unemployed & under-employed to acquire postsecondary training/education (e.g., certificates or specialized skills). A middle-skill strategy should also include opportunities for mid-level incumbent employees to acquire additional skills through both accredited and/or certificated learning programs to advance into the vacated senior/journeyman positions within their current employer and presume pre-requisite knowledge and skills for entry. These positions are prime candidates for the use of formal apprenticeship programs.

Air Transportation Career Pathway
Transportation Manufacturing Career Pathway

As explained in the next section, data for Transportation Manufacturing job postings are likely under-reported because many employers do not post the positions through formal employment listings, instead using employee referrals, trade or academic school assistance center, hiring agencies or jobs are initially advertised as temporary positions.
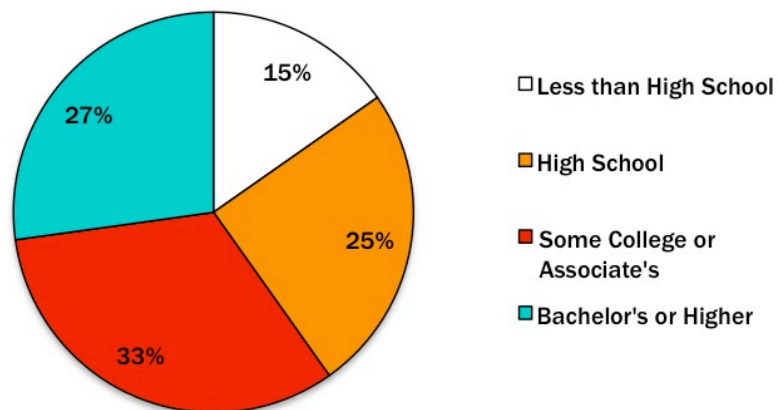
[26] EMSI 2014 San Antonio Data.

Figure 3
Examples of Local Healthcare and Biosciences Jobs That Require Middle Skills

Occupation	Required Education	2014 Employment	2014 Job Postings	2014 Median Earnings
Aircraft Mechanics and Service Technicians	Certificate	612	36	$45,989
Computer-Controlled Machine Tool Operators, Metal and Plastic	Certificate	299	59	$40,186
Industrial Machinery Mechanics	High School Diploma/ Certificate	167	2	$42,702

Source: EMSI 2014 San Antonio Data

Figure 4
San Antonio's Incumbent Labor Force: Educational Attainment for Adults 25-64

- Less than High School — 15%
- High School — 25%
- Some College or Associate's — 33%
- Bachelor's or Higher — 27%

Source: U.S. Census Bureau, 2009-2013 American Community Survey 5-Year Estimates for Bexar County.

TRANSPORTATION MANUFACTURING: DEFINITIONS

Labor Market Definitions

Identified as a targeted Industry for regional economic growth potential, the Transportation Manufacturing industry sector utilizes the vast majority of the diverse occupations common to the other manufacturing industry sectors and in some cases trades common to other industries such as construction and energy. Moreover, Transportation Manufacturing firms also employ common business-related skill sets, including computer programmers, business managers, IT support personnel and accountants. In response to industry pain points, this report focuses solely on 31 specific, "hard-to-fill" occupations. These 31 occupations comprise jobs essential to San Antonio's Automotive Manufacturing firms and Aviation companies, including Machinists, Mechanics, Assemblers, and Technicians. A complete list of jobs included in this analysis can be found in **Manufacturing Appendix A**.

After comparing these findings with a more comprehensive study by the San Antonio Manufacturing Association, the Talent Pipeline Task Force believes this report underestimates actual pipeline gaps in many of these 31 occupations because (1) many employers go through hiring agencies, (2) jobs are sometimes initially advertised as temporary positions, and, (3) jobs are often filled internally. For example, manufacturers specifically identified "Welders, Cutters, Solderers and Brazers" as hard-to-fill positions with multiple openings. Yet, in 2014, Burning Glass only identified three job openings for "Welders, Cutters, Solderers and Brazers." Thus, the following data should be regarded only as a temperature gauge for Transportation Manufacturing demand that should be periodically validated and verified by the Industry members in conjunction with WSA, keeping in mind that many jobs are underrepresented for the aforementioned reasons.
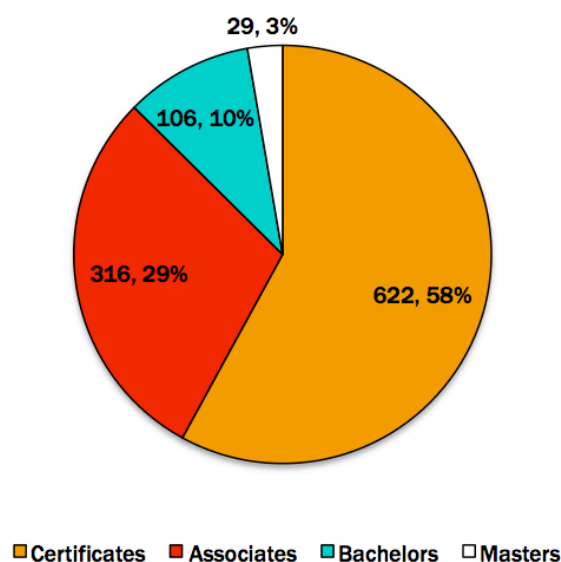
Postsecondary Award Alignment

Specific postsecondary awards were selected to align with each of the 31 occupations to identify gaps between industry needs and local talent production. In some cases, certificates provide a clear one-to-one mapping with job titles. In other cases, occupations align to more general degrees, such as Engineering. The data source for all degree information is the

National Center for Education Statistics's IPEDS data site. Most awards were classified under Mechanic and Repair Technologies/Technicians; Precision Production; Transportation and Materials Moving; and Engineering, Engineering Technologies, and Engineering-related Fields. A complete list of chosen postsecondary awards is available in **Manufacturing Appendix B**.

ESTIMATED PIPELINE GAPS (FULL YEAR 2013)

Educational Pipeline Data

Figure 5
Postsecondary Awards in Targeted Healthcare and Biosciences Areas, 2012-2013

Source: IPEDS, San Antonio Postsecondary Completions 2012-2013

The most recent postsecondary completion data available is from the 2012-2013 school year. In San Antonio, students earned 1,073 postsecondary awards in degrees aligned to targeted manufacturing jobs. Nearly ninety percent of awards were at the certificate (58%) or associate's level (29%). The most popular certificate completion was in Heating Ventilation, Air Conditioning and Refrigeration Engineering (218 completions). The most popular associate's degree completion was in Avionics Maintenance Technology/Technician (118 completions). The only included bachelor's and master's degrees were in Engineering fields, including Manufacturing and Mechanical Engineering.

Estimated Gaps

Estimating gaps in the Transportation Manufacturing pipeline is difficult not only for the previously mentioned job data issues, but also because some occupations only require a high school graduation, which firms supplement with on-the-job training. Thus, neither postsecondary awards data nor online job postings firmly capture supply and demand. Consequently, some jobs (offline postings) and some qualified applicants (high school graduates, particularly those with trade skills) are

Photo Credit Toyota Motor Manufacturing, Inc.

omitted from this report. Unfortunately, the extent to which each is omitted is unknown. Anecdotally, Transportation Manufacturing firms assert that they are competing for talent in the skilled trades with other major San Antonio industries, such as, but not limited to construction and energy, both of which have experienced significant growth recently. Moreover, a lack of emphasis by the education system on skilled trades presents a looming crisis as skilled journeymen begin to retire. Overall, with the data available, that current and projected gap is not discernible.

Figure 6
Graduates vs. Job Postings in Targeted Occupations, 2013
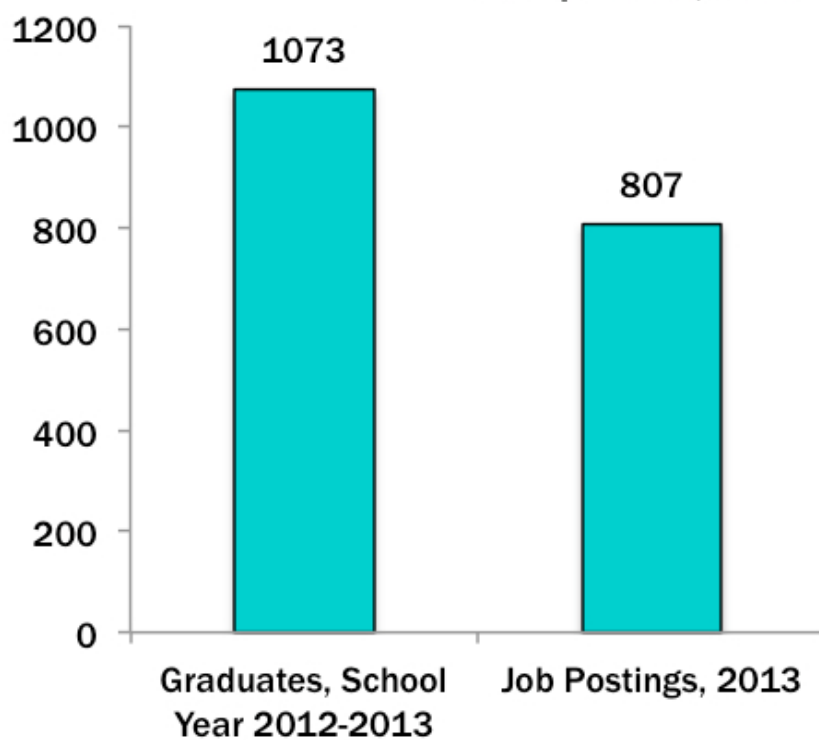
Source: SA2020 Analysis of Burning Glass, 2013.

CURRENT DEMAND

Most Demanded Occupations

HVAC Technicians and Assemblers were the most demanded jobs posted online during January 2014-April 2015, with 119 openings posted for each position. Machine Operators and Manufacturing Engineers were also in high demand. Figure 7 lists the ten most frequently posted job openings, showing the full year 2014 and the first four months of 2015.

Figure 7
Top Occupations by Job Postings, January 2014-April 2015
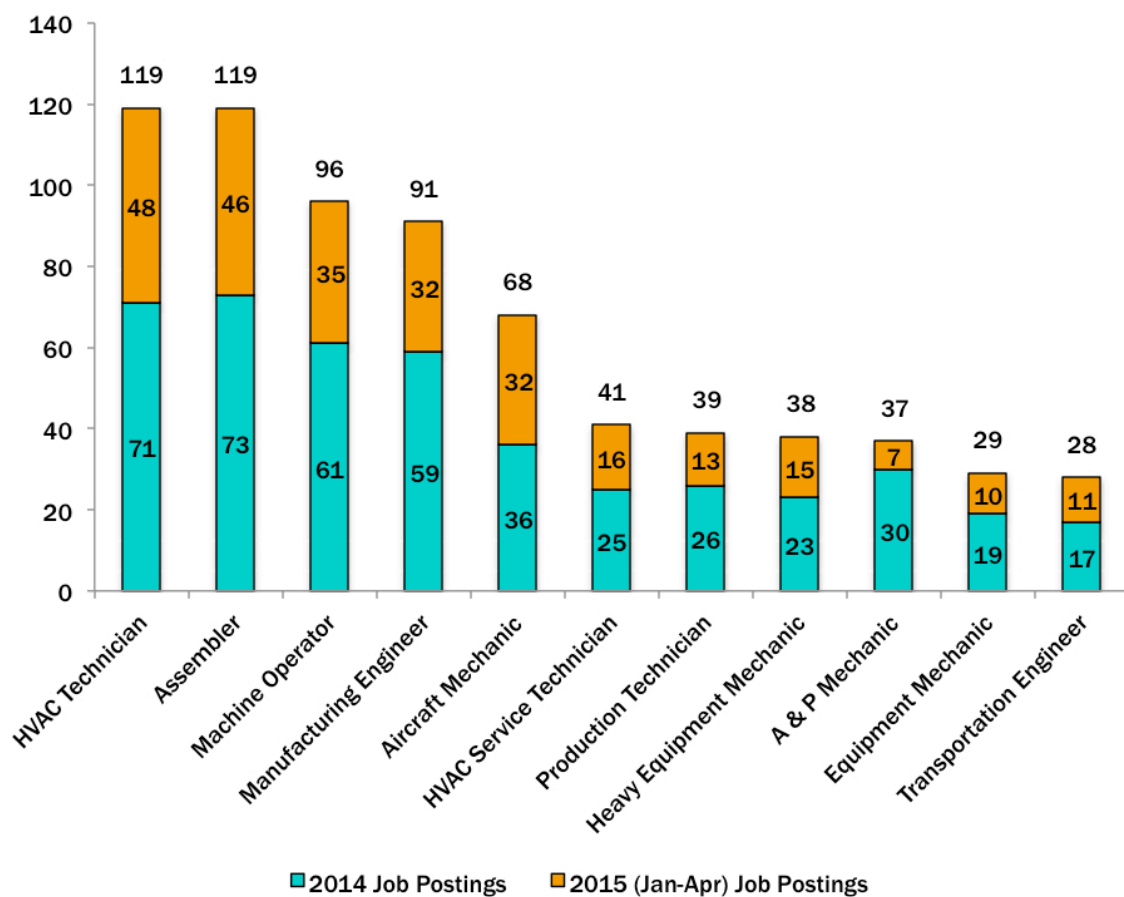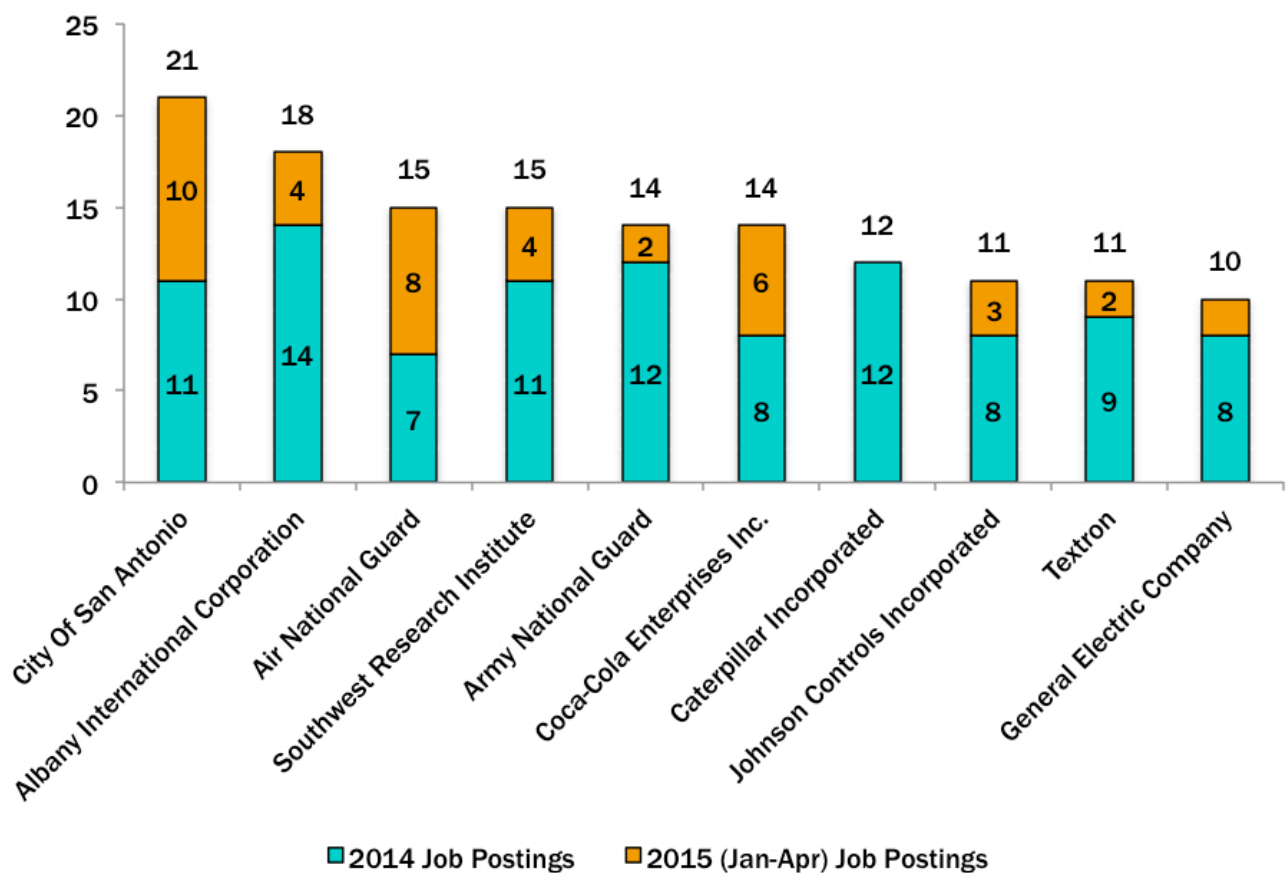

Source: SA2020 Analysis of Burning Glass, 2013.

Top Area Employers

Interestingly, job postings in the targeted Transportation Manufacturing occupations come from diverse and varied sources, with many of San Antonio's "big names" missing, including: Toyota, General Dynamics, Northrop Grumman, and Be Aerospace, among others. The City of San Antonio posted the most job openings (21) during this period—but these 21 openings represent just two percent of the 1,285 openings posted in the timeframe. Many firms posted just one job opening in each year. If industry narratives of pipeline pain points are accurate, the data seem to support the idea that companies would commonly post one job opening and use it to fill many positions of the same type.

Further analysis reveals another key insight: when querying Burning Glass for jobs posted by either the Transportation Equipment Manufacturing (NAICS 336) or Air Transportation (NAICS 481) sector, a different picture emerges: General Dynamics becomes the top employer, with 268 job postings during January-April 2015, followed by Lockheed Martin Corporation (114 openings), Northrop Grumman (66 openings), and Toyota Motors (46 openings). However, the posted openings are concentrated among positions outside this report's target jobs, including Software Developers, Network and Computer Systems Administrators, Computer Systems Analysts, and Customer Service and Sales Representatives. Again, this information supports the theory that this report's target occupations, which require lower levels of education, are likely posted online less frequently than other positions.

Figure 8
Top 10 Employers by Targeted Job Postings, January 2014-April 2015
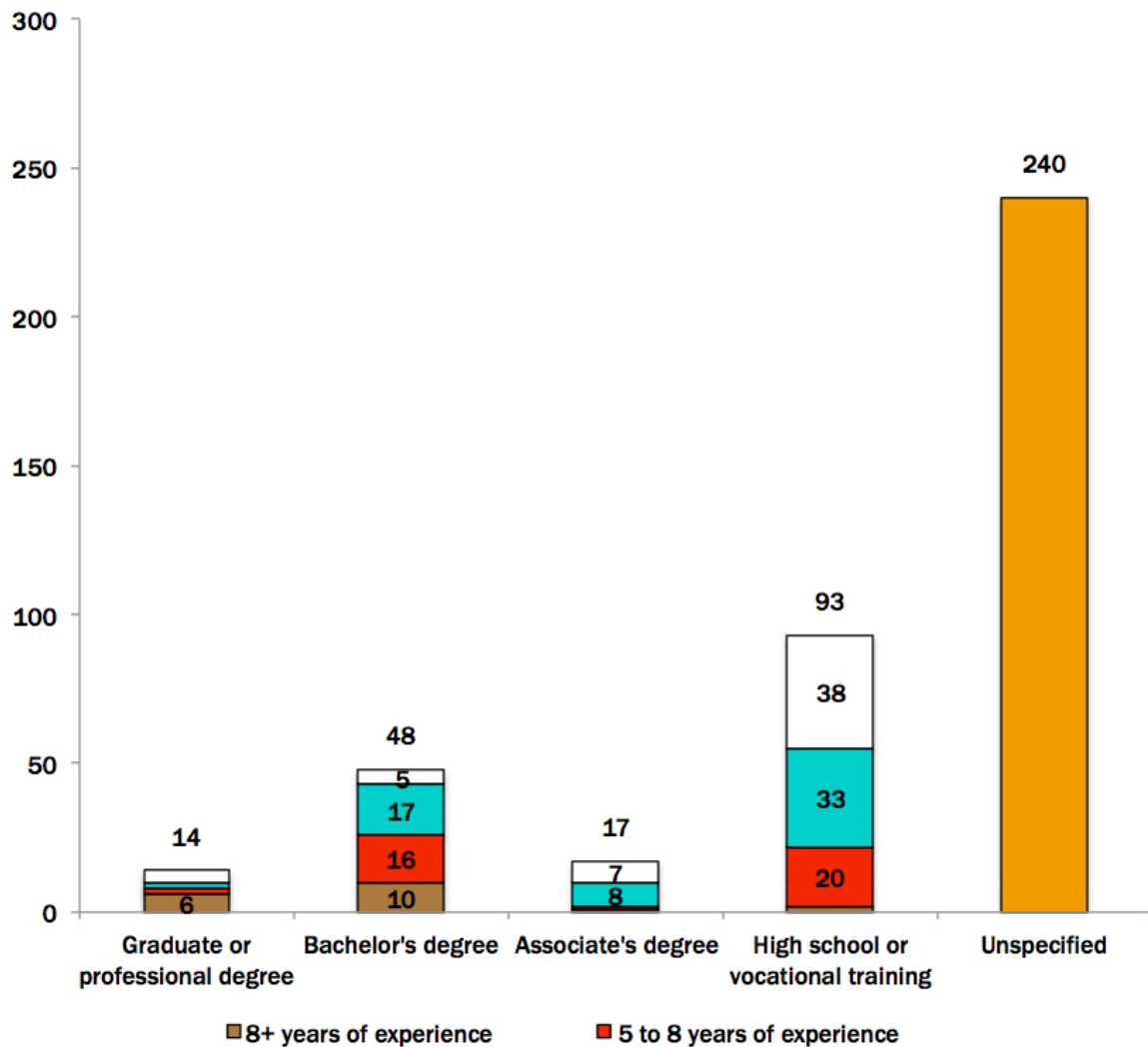

Source: SA2020 Analysis of Burning Glass, 2013.

Demanded By Education & Experience

From January-April 2015, the Transportation Manufacturing industry posted 412 open positions online. Burning Glass listed education and experience requirements for 172 postings, or 42 percent of all listed jobs. Consequently, analysis of education and experience requirements is biased towards these 42 percent of postings and may not reflect the actual demand in San Antonio. Employers who specify educational requirements are most likely to only require high school or vocational training. Two-thirds of jobs require five or fewer years of experience. Relatively few jobs (11 percent) required more than eight years of experience. Figure 9 shows the educational and experience requirements of job postings with specified baselines.

Figure 9
**Job Openings by Education and Experience,**
January-April 2015

Source: SA2020 Analysis of Burning Glass, 2013.

Most Demanded Skills

Repair is the most requested skill in online job postings from San Antonio's Transportation Manufacturing industry. Inspection is also important to many employers. During the first four months of 2015, nearly 33 percent of job postings listed Repair; 20 percent listed Inspection; and 16 percent listed HVAC. Figure 10 shows the most requested skills by job postings for January-April of 2015.

Figure 10
Most Requested Skills, January-April 2015
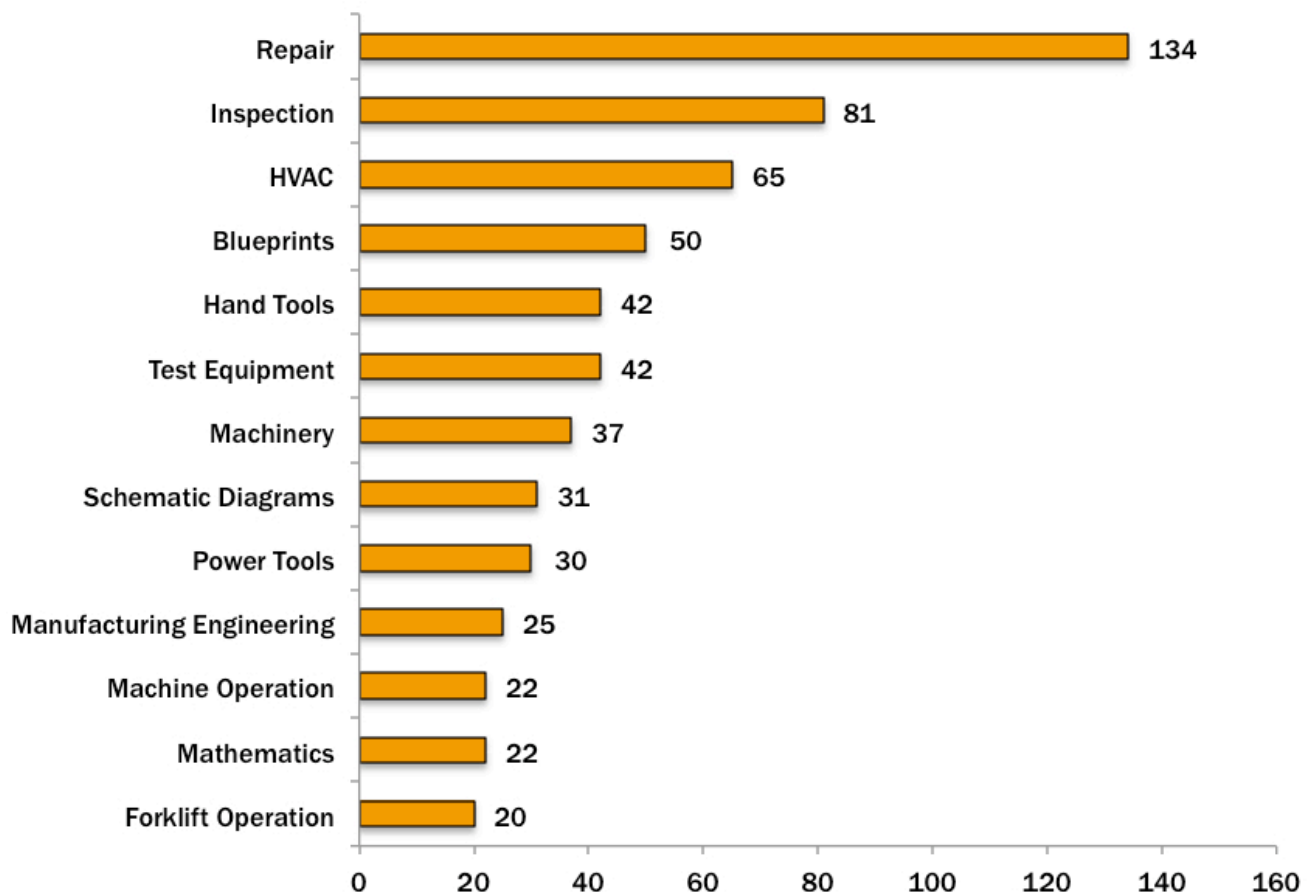
Source: SA2020 Analysis of Burning Glass, 2013.

Transportation Manufacturing Appendix A
Occupations
Classified by Burning Glass

Adhesive Bonding Machine Operators and Tenders

Aerospace Engineering and Operations Technicians

Aerospace Engineers

Air Traffic Controllers

Aircraft Cargo Handling Supervisors

Aircraft Mechanics and Service Technicians

Aircraft Structure, Surfaces, Rigging, and Systems Assemblers

Airfield Operations Specialists

Airline Pilots, Copilots, and Flight Engineers

Automotive Engineering Technicians

Automotive Engineers

Avionics Technicians

Commercial Pilots

Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic

Computer-Controlled Machine Tool Operators, Metal and Plastic

Electromechanical Equipment Assemblers

Engine and Other Machine Assemblers

Freight and Cargo Inspectors

Heating and Air Conditioning Mechanics and Installers

Industrial Machinery Mechanics

Manufacturing Engineering Technologists

Manufacturing Engineers

Manufacturing Production Technicians

Mobile Heavy Equipment Mechanics, Except Engines

Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic

Non-Destructive Testing Specialists

Outdoor Power Equipment and Other Small Engine Mechanics

Structural Metal Fabricators and Fitters

Team Assemblers

Transportation Engineers

Welders, Cutters, Solderers, and Brazers

Transportation Manufacturing Appendix B
Postsecondary Degrees

Aerospace, Aeronautical and Astronautical Engineering

Aeronautical/Aerospace Engineering Technology/Technician

Manufacturing Engineering Technology/Technician

Manufacturing Engineering

Automotive Engineering Technology/Technician

Engineering General

Mechanical Engineering

Heating Ventilation Air Conditioning and Refrigeration Engineering Technology

Heating Air Conditioning Ventilation and Refrigeration Maintenance Technology

Heavy Equipment Maintenance Technology/Technician

Instrumentation Technology/Technician

Logistics Materials and Supply Chain Management

Machine Tool Technology/Machinist

Electromechanical Technology/Electromechanical Engineering Technology

Automobile/Automotive Mechanics Technology/Technician

Welding Technology/Welder

Pipefitting/Pipefitter and Sprinkler Fitter

Aircraft Powerplant Technology/Technician

Airframe Mechanics and Aircraft Maintenance Technology/Technician   Avionics Maintenance Technology/Technician

Airline/Commercial/Professional Pilot and Flight Crew

Air Traffic Controller

Aviation/Airway Management and Operations

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