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APPLIED ANALYSIS

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SOUTHERN NEVADA TECHNOLOGY INDUSTRY OUTLOOK 20

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Applied Analysis, a Nevada-based economic research and analysis consultancy, was retained by Las Vegas Global Economic Alliance to review and analyze the technology industry in Southern Nevada. The study includes highlights of the state of the industry, economic contributions to the local economy and considerations for the future. This analysis is not intended to provide an all-encompassing analysis of the industry. Forward-looking estimates are based on an unconstrained environment (e.g., labor availability) and does not attempt to quantify the impact of broader, national economy cycles. This report is designed to establish a foundation from which additional research and impacts may be measured.

EXECUTIVE SUMMARY

Welcome to the Southern Nevada Technology Industry Outlook '20 report. While the report's title suggests that technology is its own industry, it is something much broader than that. Technology is pervasive in everything we do – how we conduct business, how we spend leisure time and how we educate the youth of our community. Technology is everywhere, and in absence of technology, we are nowhere. Defining this "thing" known as technology is challenging. For example, Switch, a Southern Nevada based data center solution, is to technology today what the railroad was to technology in the early 1800s, providing the infrastructure for companies around the world to do things that were inconceivable just a decade ago. Zappos – perhaps more appropriately its parent company Amazon – provides the most efficient link between retailers and consumers in the history of mankind. Far from a novel economic concept, Amazon is equal parts port and bazaar, giving anyone in reach of a computer or smartphone instant access to the Port of Louisiana and the Mall of America. Technology is not an industry; it is the common denominator underlying the future of all industries. Importantly, technology will both improve our lives and provide new avenues for business development and economic opportunity.

THE *INDUSTRY* OPPORTUNITY IN NEVADA

Understanding how technology has impacted the Silver State is a foundational consideration when trying to quantifying the economic impacts in Southern Nevada.

Nevada has done a remarkable job of embracing new technologies and opening new markets. In 2013, Nevada was named by the Federal Aviation Administration as one of six locations authorized to test unmanned aerial vehicles. Shortly thereafter, the state created the Nevada Institute for Autonomous Systems, which is teaming with dozens of companies that are actively developing technologies ranging from infrastructure inspection and package delivery to advanced military command and control systems.

In 2017, the Nevada Legislature passed Assembly Bill 69 (AB69), allowing the testing and operation of autonomous vehicles on Nevada roads. Arguably among the most progressive legislation of its kind in the nation, AB69 enables self-driving cars – after guaranteeing certain safety requirements – to operate commercially in Nevada without a human driver in the vehicle. Subsequently, regulations were adopted pursuant to AB69 making Nevada first in the world to establish a formal regulatory regime for the use of self-driving cars to transport persons and property. Moreover, AB69 authorizes the use of driver-assisted platooning technology. To be clear, platooning technology enables two or more trucks to travel on highways at electronically coordinated speeds, following at distances that would be unreasonable absent technological assistance, thus significantly increasing operating efficiency.

The only thing more impressive than the magnitude of these changes is the speed at which they are being developed and deployed. Perhaps the state's greatest achievement is providing the regulatory certainty companies need to reduce the time between innovation and commercialization.

Given the rapidly evolving nature of technology and automation, it is quite possible that Uber drivers may be among the shortest-lived occupations in U.S. history. Within five years, autonomous semi-trucks are expected to have the ability to move goods across the country without needing to stop for rest, to eat or for a bathroom break, significantly reducing the costs of goods movement. Within a single generation, people may not own cars, but will share and schedule them. Automation has the potential to require fewer miles of roads and highways because the current infrastructure may be used with near perfect efficiency.

Automation is just one of many emerging technologies that will change the nature of our world and the structure of our economy. There are those who fear these changes because they will displace employees and make some businesses functionally obsolete. These are legitimate concerns, and the rapid transformation of the economy will require increased attention of policymakers to help working families adapt. It is imperative to not slow, inhibit or create any artificial barriers to the development, testing and deployment of new technologies. It is also important to remember the potential that many of these technologies have to increase productivity and, most importantly, save thousands of lives. Ninety-four percent of motor vehicle fatalities – more than 30,000 deaths in the United States last year alone – were caused by human error. News reports will inevitably focus on tragedies that occur when self-driving technology fails, is improperly used or cannot prevent an accident, but few reports will be made about the thousands of times the technology saves a life. Nevada's willingness to be an early adopter is already paying dividends and the long-term upside more than outweighs any short-run challenges.

TECHNOLOGY IN SOUTHERN NEVADA

Generally speaking, every business in Southern Nevada utilizes technology – thus defining the "tech industry" can be challenging. It is clear that companies like Cox Communications, Switch and Zappos that operate in Southern Nevada are by their very nature technology companies. Their business models revolve specifically around a technology function, and tracking their economic contributions to the local economy is relatively straightforward. They employ workers, those employees earn wages and that business generates economic activity. Notably, employees of these types of companies span both technology occupations (e.g., computer programmers), but they also employ support positions (e.g., human resources or finance staff). The employees of these companies are sourced to the technology industry and are commonly classified as such (they are referred to herein as "technology industry companies"). In 2019, businesses considered to be part of the technology industry employed approximately 31,600 workers in Southern Nevada.

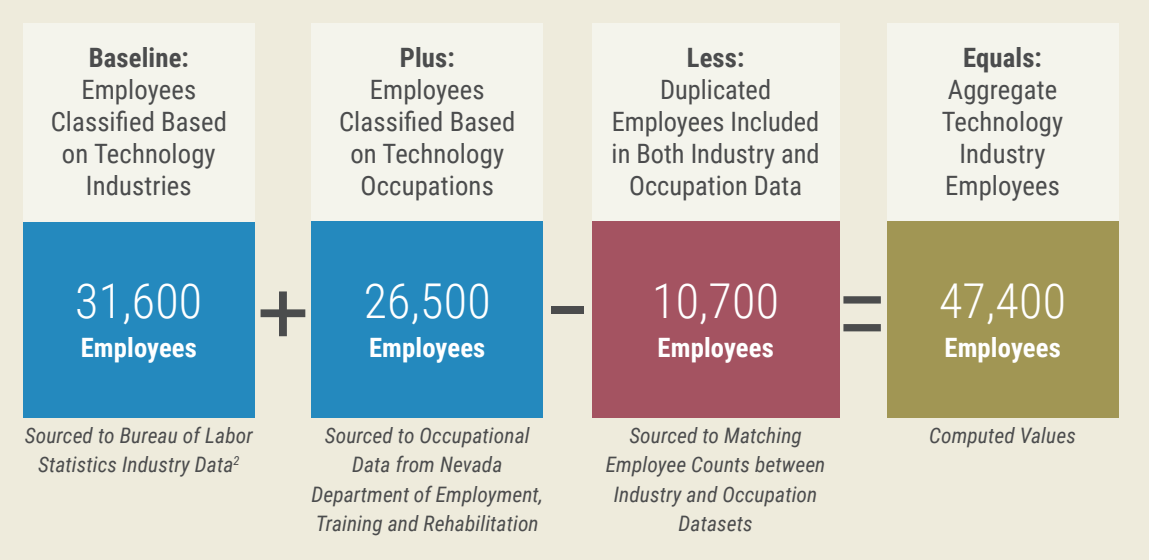


In addition to companies that clearly fall into a predefined list of technology-related sectors, there are technology workers who are employed by non-technology companies classified in any number of industries. For example, MGM Resorts International employs technology personnel who are responsible for managing customer databases, developing web technologies or operating a complex web of servers, slot machines and software. In this example, the employer is classified as a leisure and hospitality sector company,

but those workers dedicated to the firm's technology initiatives clearly contribute to the broader technology industry in Southern Nevada. Publicly available databases of occupational data allow for the aggregation of employee counts based on positions (they are referred to herein as "technology occupations") rather than the employers that are classified by industry. In 2019, the number of employees classified as technology occupations, regardless of employer classification, totaled 26,500 in Southern Nevada.

Not surprisingly, there are a significant number of technology occupation employees who also fall within technology industry employers' classification. For example, a server technician at Switch would be counted in both the technology industry company employee counts as well as the technology occupation employee data. To ensure that workers are not double counted, those employees who fall in both categories must be adjusted to ensure they are only counted once. The following graphic attempts to demonstrate the mathematics behind the calculations to estimate the tech industry overall.

DEFINING THE TECH INDUSTRY[1]



QUANTIFYING THE INDUSTRY IMPACT IN SOUTHERN NEVADA

With an established count of total employment within the industry, the next step in the impact assessment process is to quantify the economic contributions of technology-related activity in Southern Nevada – past and present. As noted above, one could easily come to the conclusion that nearly all of Southern Nevada's $112 billion of gross regional output is attributable to, if not dependent upon, technology. Respecting this point, the un-duplicated total of technology industry companies and technology workers employed in other sectors of the economy directly account for approximately 7 percent of the total economic activity in Southern Nevada, or $9.1 billion annually. For reference, the national technology industry accounts for approximately 10 percent of activity.

[1] *See the Methodology and Assumptions section of the report for additional details on the approach, classifications of industries and occupations and other limitations.*

[2] *In addition to reported technology industries, a review of specific company data was completed to manually classify known technology companies in the Southern Nevada market that were not included in predefined industry classifications.*

Economic impacts include employment, salaries and wages and overall economic output (business receipts). The direct impacts reflect activity sourced specifically to the tech industry, and those impacts have a ripple effect throughout the economy. In addition to direct activity, the indirect (vendor purchases) and induced (employee spending) impacts are meaningful. Overall, the industry's direct impacts include 47,400 employees earning a total of $3.6 billion in salaries and wages and supporting $9.1 billion in estimated economic activity (output) in 2019. The industry's direct employment of 47,400 is comparable to the aggregate employment in the transportation, warehousing and utilities industries in Southern Nevada.

Including the secondary impacts, or ripple effect, of the industry, total employment reaches 88,800, which supports aggregate incomes in Southern Nevada of $5.5 billion. Total economic output increases to $15.1 billion when indirect and induced impacts are considered. Stated otherwise, for every one dollar of economic activity directly sourced to the technology industry, the community benefits $1.67.

Since 2015, total technology-related employment has expanded by 29.6 percent, personal incomes sourced to the industry grew by 38.5 percent and economic activity jumped by 24.8 percent. For comparison purposes, overall employment in Southern Nevada expanded by 12.4 percent during the same time frame. As such, direct job growth within the technology industry accounted for nearly 12 percent of all growth. When the secondary job impacts are considered, total tech industry employment represented nearly 18 percent of all job gains since 2015.

ECONOMIC IMPACT BY YEAR

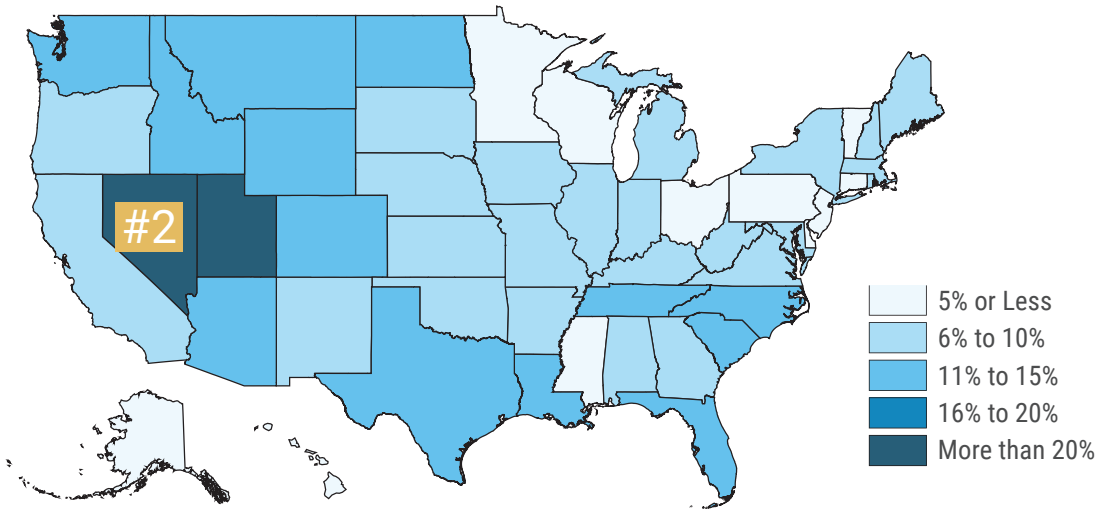
IMPACT	2015	2016	2017	2018	2019e	GROWTH SINCE 2015
EMPLOYMENT						
Direct	33,900	37,700	42,900	44,600	47,400	39.8%
Indirect	17,000	17,600	17,200	18,600	18,100	6.5%
Induced	17,700	19,200	20,900	22,600	23,300	31.6%
Total	**68,500**	**74,600**	**81,000**	**85,800**	**88,800**	**29.6%**
SALARIES AND WAGES						
Direct	$2.41 B	$2.70 B	$3.08 B	$3.38 B	$3.57 B	47.9%
Indirect	$0.81 B	$0.85 B	$0.84 B	$0.92 B	$0.90 B	10.6%
Induced	$0.77 B	$0.85 B	$0.93 B	$1.02 B	$1.06 B	38.5%
Total	**$4.00 B**	**$4.40 B**	**$4.86 B**	**$5.32 B**	**$5.53 B**	**38.5%**
ECONOMIC OUTPUT						
Direct	$7.22 B	$7.52 B	$7.50 B	$8.21 B	$9.06 B	25.3%
Indirect	$2.36 B	$2.48 B	$2.40 B	$2.60 B	$2.57 B	9.0%
Induced	$2.54 B	$2.80 B	$3.06 B	$3.35 B	$3.50 B	37.7%
Total	**$12.13 B**	**$12.80 B**	**$12.96 B**	**$14.16 B**	**$15.13 B**	**24.8%**

FUTURE GROWTH PROSPECTS

Beyond the historical contributions of the technology industry, the Silver State is expected to experience the second fastest rate of tech job growth in the nation through 2026. Similarly, the Las Vegas metro area is projected to benefit from the third fastest rate of growth among major cities in the United States. While today local technology employment ranks relatively modestly as the 37th largest tech employment contributor, according to CompTIA, Southern Nevada's growth prospects are expected to close the gap.

PROJECTED TECH **EMPLOYMENT GROWTH**

2018 to 2026



PROJECTED TECH **EMPLOYMENT GROWTH**

2018-2026

RANK	STATE	EMPLOYMENT GROWTH
1	**Utah**	21.8%
2	**Nevada**	**20.4%**
3	**South Carolina**	14.2%
4	**Colorado**	13.5%
5	**Texas**	13.3%
6	**Wyoming**	13.2%
7	**Idaho**	13.1%
8	**North Carolina**	12.2%
9	**Washington**	11.5%
10	**Montana**	11.3%

PROJECTED TECH **EMPLOYMENT GROWTH**

2018-2026

RANK	MSA	EMPLOYMENT GROWTH
1	**Austin**	20.2%
2	**Salt Lake City**	18.6%
3	**Las Vegas**	**16.9%**
4	**San Francisco**	16.0%
5	**Denver**	15.0%
6	**Nashville**	14.9%
7	**Raleigh**	14.1%
8	**Orlando**	13.4%
9	**San Antonio**	12.9%
10	**Charlotte**	12.2%

Source: Cyberstates 2019, CompTIA

FUTURE CONSIDERATIONS

Southern Nevada's tech industry has benefitted from forward-looking public policy decisions and timely private investments in recent years, laying a solid foundation for the industry for years to come. While it would be unrealistic to expect Southern Nevada to transform into the next Silicon Valley anytime soon, the region has established an environment where technology companies have the potential to thrive and where overall economic development is creating a robust market for technology workers in all industries. Below are some recommendations we believe will help Southern Nevada build on these trends and maximize opportunities in the technology space.

1. Close the Gap or Fall Behind

The number of technology jobs in Las Vegas ranks relatively low as the 37th largest tech employment base among major metro areas across the country. It is critical for Southern Nevada to close the gap to remain competitive from not only a technology perspective but an economic perspective. Third parties, including the Nevada Department of Employment, Training and Rehabilitation and CompTIA, suggest that Southern Nevada will expand its technology employment base by approximately 5,000 positions by 2026, ranking as the third fastest expanding market during that period. Shoring up this segment of the economy will be no small task; it requires a coordinated effort and specific strategies to remain competitive.

2. Be an Early Adopter, Take Risks, Accept Failures

Early adoption and a can-do attitude has helped position Nevada at the leading edge of emerging technology areas such as unmanned aerial systems, autonomous vehicles and data warehousing and infrastructure. It is also home to nascent transportation technologies, such as Virgin Hyperloop and The Boring Company's underground transit system, with the potential to change how people and goods are moved. The presence of tech companies in these areas provide opportunities to not only grow existing business but to also identify and grow support industries and suppliers that are part of the tech industry as well. Local tech companies also signal to the industry and the world that Southern Nevada is not afraid of innovation, but rather, is a partner in progress.

3. Leverage the Core Hospitality Industry

Southern Nevada is arguably the most advanced leisure and hospitality market in the world. Fortune 500 companies based in Las Vegas own and operate many of the largest hotels around the globe. In addition to the wide range of amenities and industry-leading customer service, technology plays a major role in the performance of these massive resorts. Leveraging the experience and expertise of local CTOs, software developers and other technology experts who already call Las Vegas home to identify opportunities to foster internal specializations or attract industry-specific providers to Southern Nevada is necessary. The process can be company-specific (internal) or perhaps more holistic with periodic industry meetings of key personnel to share ideas, identify needs and develop strategies to grow technology capacity within the resort industry locally.

4. Double Down on Workforce

Recruiting and retaining a qualified workforce is as important for the tech industry as any other. From computer programmers to audio-visual equipment technicians, occupations in the tech industry require specialized training and experience. Southern Nevada has successfully expanded its tech workforce in recent years to meet the needs of a growing tech industry, and future growth in the industry will only go as far as the workforce can take it. While qualified tech workers can be, and are being, imported from out of state, meeting the future needs of the industry in Southern Nevada will require the ongoing identification, development and training of home-grown talent. Consider adding coding in every classroom, and continuing to support training and education programs at the K-12 (STEM fields), community college and university levels will help provide the necessary workforce for the tech industry of the future. As students look to transition from education (regardless of attainment level) to the workforce, internship programs, technical academies and industry training programs will provide greater opportunities for individuals and the community.

5. Establish a Tech Association, Listen to Them

Other markets have technology associations or trade organizations dedicated to the advancement of the industry; a similar organization may be suitable for Southern Nevada. Key initiatives for an association of this nature may include a community leadership role in the expansion of the tech industry while providing tech leaders, innovators and entrepreneurs the resources they need to thrive.

6. Reinforce and Specialize Where Possible

Ensuring that Southern Nevada captures its fair share (or more) of an expanding and rapidly revolving technology industry is important. Communities that are aggressive in attracting, developing and retaining technology-related investments and businesses will be better for it in the long run. Shifts in the global economy, business climate and population will demand technologies not even conceived today. However, in addition to growing the pie, it will be critical for community and business leaders not to try and be everything to everyone. Maintaining specialization in selected segments of the tech industry can lead to achievable and quantifiable objectives. Being the best within a handful of market spaces has the potential to pay greater dividends than being good at countless more.

7. Two Opportunities: Healthcare and Technology

The healthcare industry remains one of the fastest growing segments of the broader economy, and Southern Nevada tends to lags other communities in providing the necessary resources and infrastructure. Innovation is also taking place at a record pace within the healthcare sector. According to Global Market Insights, telemedicine is expected to become a $130 billion global market by 2025. While the local market struggles to maintain a sufficient number of physicians given the region's pace of growth, finding ways for doctors to serve patients from outside Nevada may be a solution. Southern Nevada has an opportunity to kill two birds with one stone by moving aggressively into the healthcare technology realm to maximize opportunities in tech and cure shortcomings within the local healthcare space.

TECHNOLOGY IN SOUTHERN NEVADA

The rapidly evolving landscape of technology that is changing how the world communicates, travels, creates and does business is changing everyday life and commerce in Southern Nevada. It is also opening doors for business development, employment opportunities and greater economic diversification.

Signs of the region's developing technology sector are evident in the frequent news announcements that herald new keystone projects and investments from some of the industry's most influential firms. Online retailer Amazon has rapidly increased its Southern Nevada footprint as it builds out its warehouse and logistics network to make deliveries within hours rather than days. Homegrown data center company Switch is pioneering digital infrastructure and storage capabilities, while Virgin Hyperloop is developing technology with the potential to transform transportation.



Beyond the headline-making work of these well-known companies, thousands of local tech firms employ tens of thousands of workers throughout Southern Nevada, while thousands more tech employees work at non-tech companies, supporting the internal technology needs that are integral to modern-day business operations.

Southern Nevada's technology landscape has made remarkable strides in recent years, but the reality is that it still lags behind peer metro areas in the western United States. In just the past decade, foresight, preparation and execution have helped transform Southern Nevada's technology landscape and economy in ways few predicted. The opportunity to close the gap is here, thanks to forward-looking public policy, committed leadership and a growing wave of momentum in the regional technology arena.



Google is constructing a $600 million data center in Henderson and is expected to hire 50 full-time workers, who will be paid an average of $65,000. The project broke ground in July 2019 and has an expected completion date of December 2020. Henderson was also announced as a Google Cloud region, suggesting that the Henderson data center is geared towards improving service for Google Cloud customers in the Western United States.

PROFILE: COX



Home Solutions
- Gigabit Internet speeds
- **Contour2** with voice remote
- Whole-home, Panoramic WiFi
- HomeLife home automation

Business Solutions
- Fiber Internet up to **100 Gig** speeds
- Cloud Services – DaaS, IaaS, DRaaS
- Software defined networks
- Managed Services (phone, networks, WiFi)

Media Solutions
- TV, Tablet, Mobile and Computer Advertising
- Video, Audio and Display Creative Services
- Aggregated Marketing and Research Intelligence
- Customized Marketing Solutions

Network
- Digitally equipped self-healing
- **Triversity** 3- way redundancy
- Fiber deeper throughout the valley
- **$10B** nationwide investment

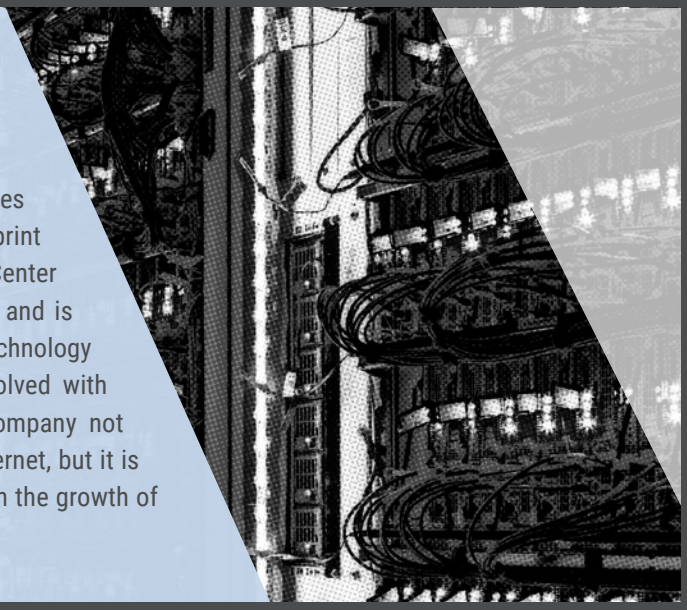
Arenas and Convention Space
- Allegiant Stadium – **Raiders**
- Las Vegas Convention Center
- T-Mobile Arena – **Vegas Golden Knights**
- UNLV Thomas & Mack Center
- Las Vegas Ball Park – **Aviators**

Smart Communities
- Curbside Management
- Asset Tracking
- Connected Fleet
- Smart Industries (healthcare, retail, Ag, energy)

How Cox Connects to the Community
- **Economic Impact** – **$1.8B** to Nevada
- **Jobs Creator** – **1,500** employees
- **Community Investment** - **$4M** annual giving by Cox Charities, employees, and company
- **Community Involvement** – **24,000** average annual employee volunteer hours
- **Supporting Education** – $9.95 broadband Internet for low-income families

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PROFILE: SWITCH

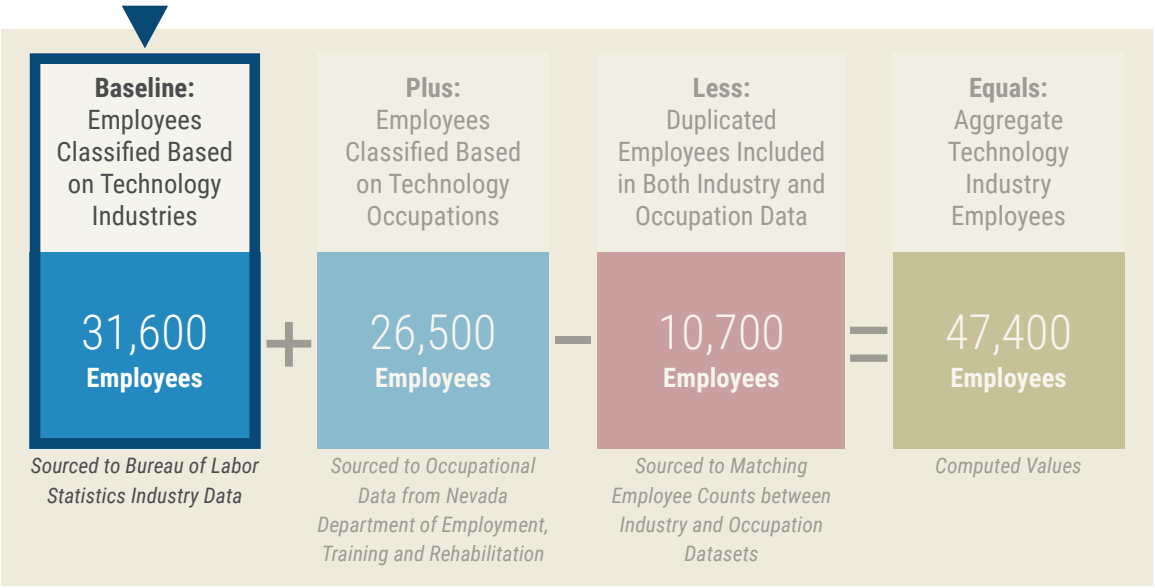


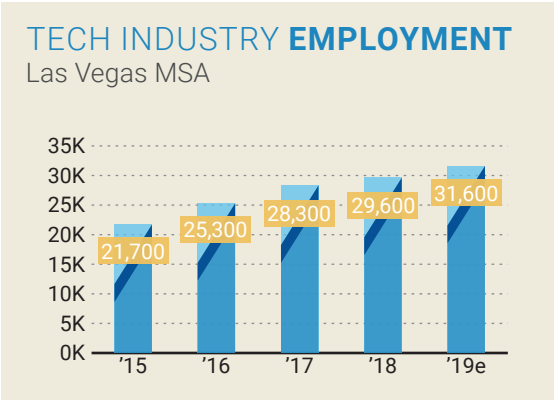
Switch represents one of the most notable tech-based companies embedded in Southern Nevada. The company has a strong footprint in Nevada, both in Northern Nevada at the Tahoe-Reno Industrial Center and in the Las Vegas Valley. The company was founded in 2000 and is headquartered in Las Vegas. Switch is self-described as a "technology infrastructure ecosystem corporation," and is fundamentally involved with the development, design and operation of data centers. The company not only provides ecosystems to support businesses reliant on the internet, but it is also chiefly concerned with designing data centers that will sustain the growth of the internet.

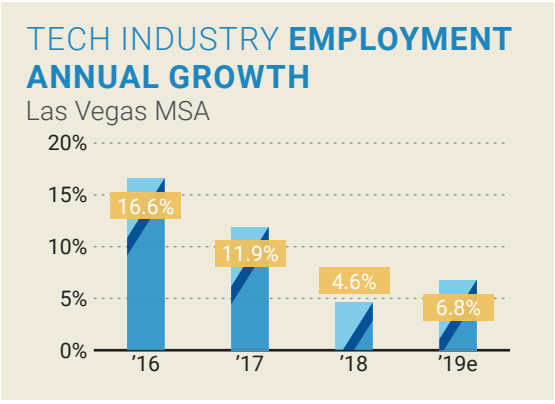
TRENDS BASED ON INDUSTRY DATA

The tech industry in Southern Nevada has experienced significant growth over the past five years. According to data from the U.S. Bureau of Labor Statistics, companies with defined technology industry classifications reported aggregate employment growth rising from 21,700 jobs in 2015 to 31,600, an addition of 9,900 jobs that equates to a growth rate of 45.6 percent over that timeframe. The employment growth rate for Southern Nevada's tech industry was nearly triple the regional growth rate of 13.1 percent for all industries over the same period and six times the national employment growth rate of 7.5 percent. Wages earned by workers for these companies reported a similar trend, climbing 59.3 percent from $1.6 billion in 2015 to $2.6 billion in 2019. The growth in employment and wages has translated into the tech industry gaining a larger share of both measures in the region. The growth trend for tech businesses has been positive, as well, with the number of establishments growing by 16.2 percent between 2015 and 2019.

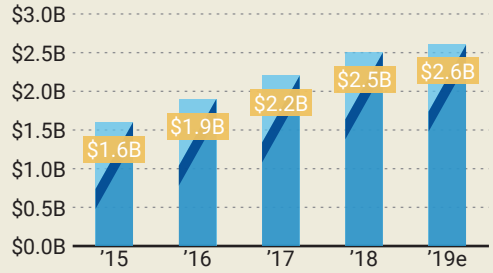
Over the same time period, the tech industry reporting the fastest job growth rate was software publishers, which expanded by more than 55 percent, while the computer system design services industry added the most jobs at 614. Computer training companies reported the second-fasted job growth since 2015, giving the sector the highest employment location quotient among all tech sectors in Southern Nevada. The sector's 2.57 location quotient means its employment concentration is two and a half times the U.S. average.



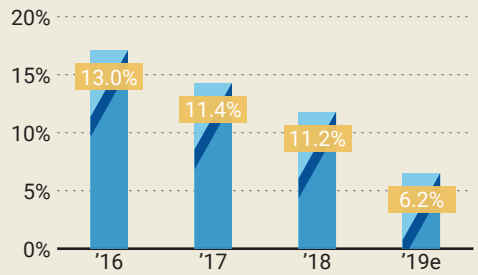




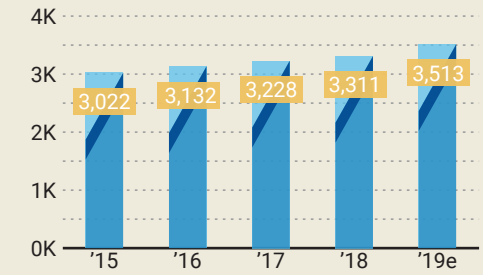
TECH INDUSTRY **TOTAL WAGES**
Las Vegas MSA



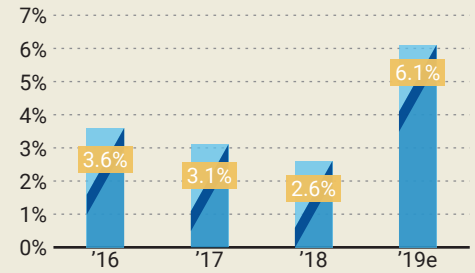
TECH INDUSTRY **TOTAL WAGES ANNUAL GROWTH**
Las Vegas MSA



TECH INDUSTRY **ESTABLISHMENTS**
Las Vegas MSA



TECH INDUSTRY **ESTABLISHMENTS ANNUAL GROWTH**
Las Vegas MSA



TOP 5 TECH INDUSTRIES **BY EMPLOYMENT GROWTH**
2015-2019 | Las Vegas MSA

INDUSTRY	GROWTH
Computer Systems Design Services	614
Custom Computer Programming Services	422
Software Publishers	405
Computer and Software Merchant Wholesalers	370
Data Processing, Hosting and Related Services	358

TOP 5 TECH INDUSTRIES **BY EMPLOYMENT GROWTH RATE**
2015-2019 | Las Vegas MSA

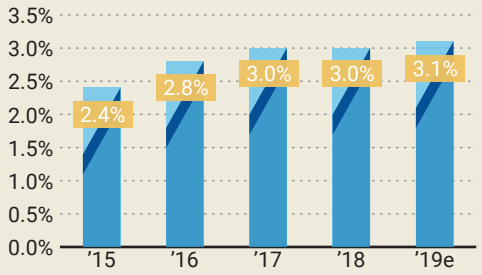
INDUSTRY	GROWTH RATE
Software Publishers	55.1%
Computer Training	47.6%
Other Computer Related Services	33.3%
Computer Systems Design Services	31.1%
Data Processing, Hosting and Related Services	29.1%

Source: U.S. Bureau of Labor Statistics, Applied Analysis

Note: Historical establishment data has been benchmarked to known values.

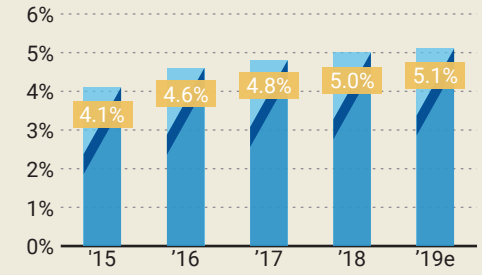
TECH INDUSTRY **EMPLOYMENT**

Share of All Employment
Las Vegas MSA



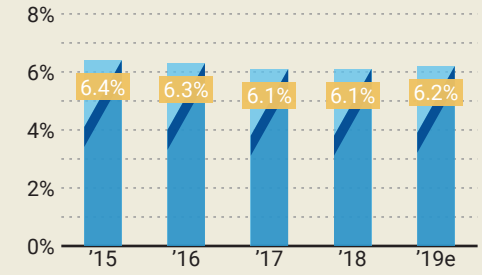
TECH INDUSTRY **WAGES**

Share of All Wages
Las Vegas MSA



TECH INDUSTRY **ESTABLISHMENTS**

Share of All Establishments
Las Vegas MSA



TOP 10 TECH INDUSTRIES **EMPLOYMENT LOCATION QUOTIENT**

2019 | Las Vegas MSA

INDUSTRY	LOCATION QUOTIENT
Satellite Telecommunications	2.29
Computer Training	1.15
Computer and Office Machine Repair	1.02
Telecommunications Resellers	0.90
Engineering Services	0.79
Other Electronic Equipment Repair	0.76
Testing Laboratories	0.76
Data Processing, Hosting and Related Services	0.69
Computer Facilities Management Services	0.67
Wired Telecommunications Carriers	0.60

BOTTOM 10 TECH INDUSTRIES **EMPLOYMENT LOCATION QUOTIENT**

2019 | Las Vegas MSA

INDUSTRY	LOCATION QUOTIENT
Computer Systems Design Services	0.37
Wireless Telecommunications Carriers (Except Satellite)	0.37
Other Computer Related Services	0.26
Computer and Software Merchant Wholesalers	0.25
Analytical Laboratory Instrument Mfg.	0.23
Audio and Video Equipment Manufacturing	0.20
All Other Telecommunications	0.13
Other Electronic Component Manufacturing	0.12
Broadcast and Wireless Communications Equip.	0.06
Electromedical Apparatus Manufacturing	0.01

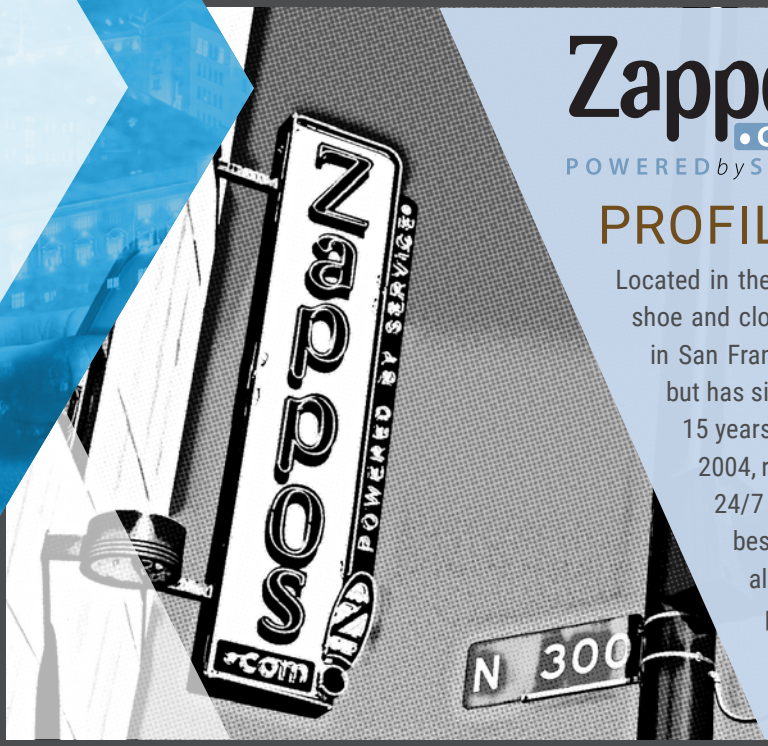
Source: U.S. Bureau of Labor Statistics, Applied Analysis



APTIV

PROFILE: APTIV

Aptiv develops and utilizes new software and hardware to make advances in the autonomous vehicle industry, specifically as it relates to the effective integration of technologies and products. The company is also involved with research and development related to vehicle connectivity, smart architecture and active safety. Aptiv is currently operating in the Southern Nevada market, working in conjunction with Lyft to provide automated taxi rides to the public using the ride-sharing application. Aptiv also made another significant contribution to the industry in 2017, supporting the longest autonomous drive via a coast-to-coast trip from San Francisco to New York City.



Zappos.com POWERED by SERVICE™

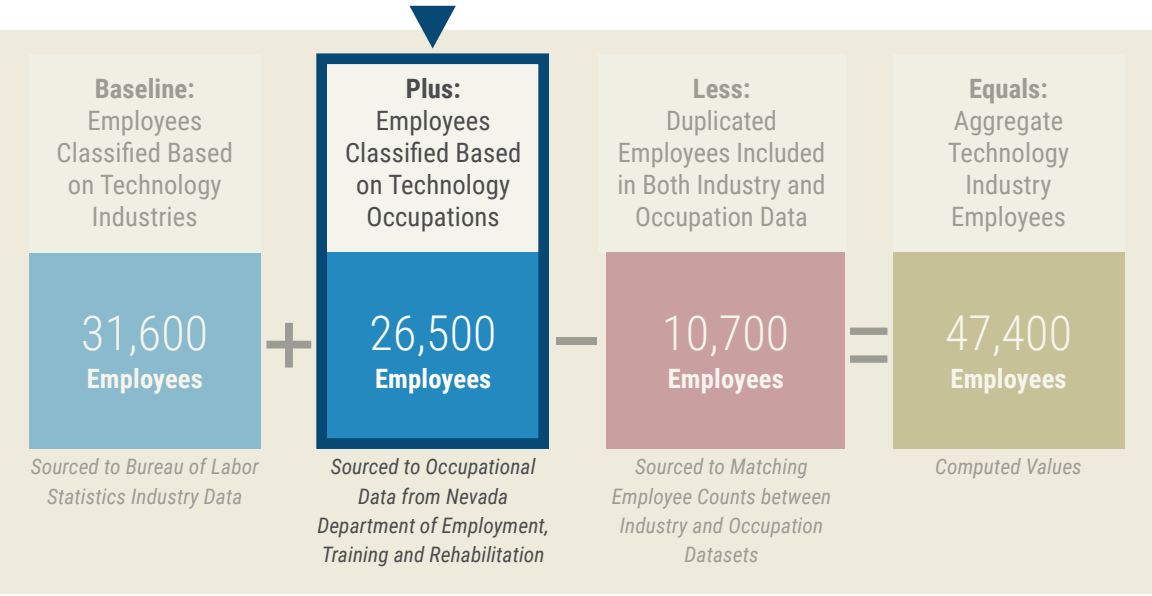
PROFILE: ZAPPOS

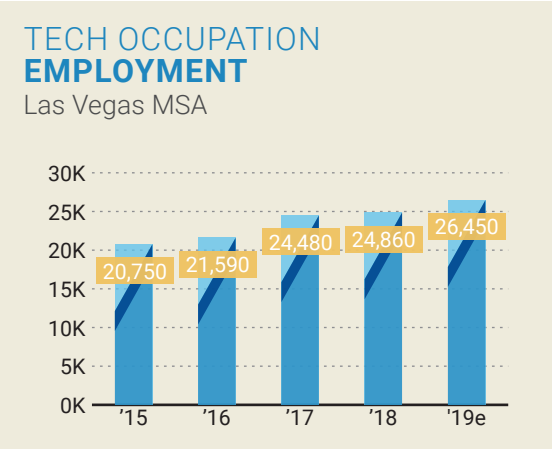
Located in the former Las Vegas City Hall building, Zappos is an online shoe and clothing retailer based in Southern Nevada. Founded in 1999 in San Francisco, the company was originally an online shoe retailer but has since expanded to clothing, handbags and accessories. After 15 years in business, the company relocated to Southern Nevada in 2004, recognizing the benefit of being located in a service-oriented, 24/7 city. The company prides itself on providing the absolute best service and experience for its customers. Zappos has also made it a priority to give back to the community through partnerships, donations to charitable causes and volunteer hours donated by employees.

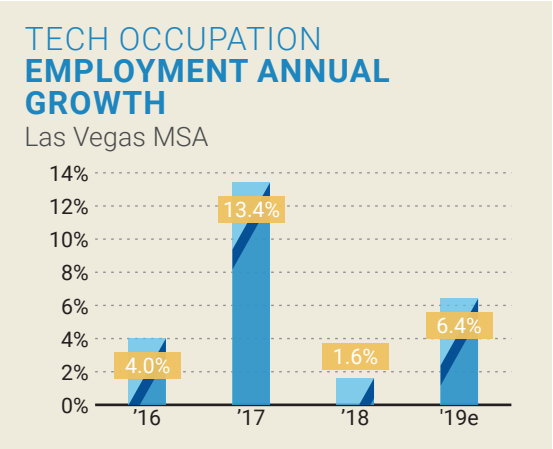
TRENDS BASED ON OCCUPATIONAL DATA

While Southern Nevada's tech industry has experienced notable job growth since 2015, so too has the number of tech occupations both inside and outside the industry. Federal data on Southern Nevada tech occupations (e.g., classified by occupation regardless of industry) exhibit trends that mirror broader industry growth patterns. Total occupational employment has grown from 20,800 in 2015 to 26,500 in 2019, equating to a 27.5 percent growth rate. Total wages for these occupations have trended similarly, expanding by a higher growth rate of 33.7 percent from $1.5 billion to $2.1 billion.

Growth in tech occupational employment reflects the need for qualified workers not only for tech-focused companies but also for non-tech companies whose reliance on technology in everyday operations is a reality of the world we live in today. To illustrate this reality, two of the top five industries with the most tech occupation employees are public administration (i.e., local, state and federal government) and accommodation and food services. Enterprises in these in these industries aren't in the business of technology, but technology plays an important role in their day-to-day operations and thus requires a tech workforce to their support their core mission; these industries also account for in excess of 300,000 jobs in Southern Nevada.



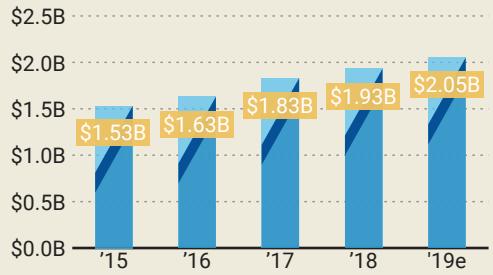




Source: Nevada Department of Employment, Training and Rehabilitation

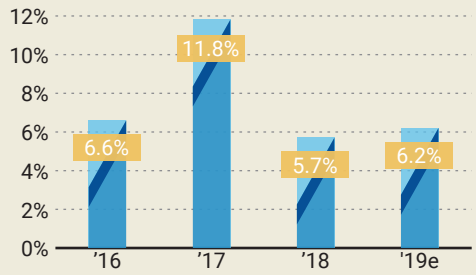
TECH OCCUPATION **TOTAL WAGES**

Las Vegas MSA



TECH OCCUPATION **WAGES ANNUAL GROWTH**

Las Vegas MSA



TOP 5 INDUSTRIES WITH THE **MOST TECH OCCUPATION EMPLOYMENT**

Las Vegas MSA

INDUSTRY	TOTAL EMPLOYMENT	TECH EMP.	TECH %
Professional and Technical Services	35,710	5,000	14.0%
Information	9,820	3,240	33.0%
Management of Companies and Enterprises	18,510	2,470	13.3%
Public Administration	40,490	1,500	3.7%
Accommodation and Food Services	259,780	1,280	0.5%

TOP 5 INDUSTRIES WITH THE **HIGHEST CONCENTRATION OF TECH OCCUPATION EMPLOYMENT**

Las Vegas MSA

INDUSTRY	TOTAL EMPLOYMENT	TECH EMP.	TECH %
Information	9,820	3,240	33.0%
Utilities	1,130	170	15.0%
Professional and Technical Services	35,710	5,000	14.0%
Management of Companies and Enterprises	18,510	2,470	13.3%
Manufacturing	21,020	1,220	5.8%

Source: Nevada Department of Employment, Training and Rehabilitation

TECH OCCUPATIONS WITH THE MOST **EMPLOYMENT**

Las Vegas MSA

OCCUPATION	EMPLOYMENT	% OF TECH EMP.
Software Developers, Applications	3,090	11.7%
Computer User Support Specialists	2,520	9.5%
Audio and Video Equipment Technicians	2,380	9.0%
Computer Occupations, All Other	2,030	7.7%
Telecommunications Equipment Installers & Repairer	1,380	5.2%
Computer Network Support Specialists	1,380	5.2%
Computer Systems Analysts	1,360	5.1%
Computer and Information Systems Managers	1,350	5.1%
Electrical and Electronic Engineering Technicians	1,080	4.1%
Network and Computer Systems Administrators	1,060	4.0%

TECH OCCUPATIONS WITH THE MOST **JOB GROWTH**

2015-2019 | Las Vegas MSA

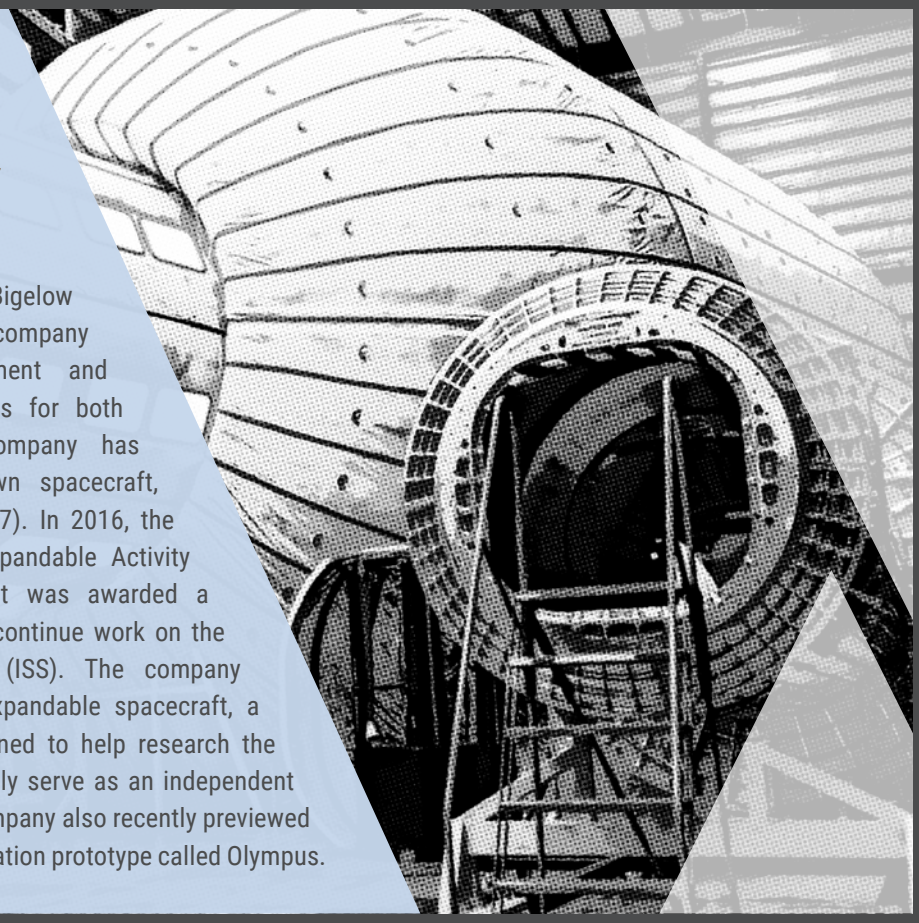
OCCUPATION	JOB GROWTH
Software Developers, Applications	1,400
Computer Support Specialists	1,110
Computer Network Support Specialists	840
Audio and Video Equipment Technicians	500
Computer and Information Systems Managers	400
Electrical and Electronics Engineering Technicians	380
Electrical and Electronic Equipment Assemblers	380
Computer Occupations, All Other *(includes videogame designer, business intelligence analyst, and others)*	350
Telecommunications Equipment Installers and Repairers, Except Line Installers	310
Aerospace Engineers	300

TECH OCCUPATIONS WITH THE HIGHEST **AVERAGE ANNUAL WAGE**

Las Vegas MSA

OCCUPATION	AVERAGE WAGE	EMPLOYMENT
Architectural and Engineering Managers	$145,100	500
Computer and Information Systems Managers	$138,410	1,350
Software Developers, Applications	$107,160	3,090
Biomedical Engineers	$103,750	20
Computer Network Architects	$103,460	490
Computer Hardware Engineers	$94,590	80
Software Developers, Systems Software	$94,330	810
Engineers, All Other	$93,260	340
Aerospace Engineers	$92,210	300
Database Administrators	$91,960	470

Source: Nevada Department of Employment, Training and Rehabilitation



PROFILE: BIGELOW AEROSPACE

Headquartered in North Las Vegas, Bigelow Aerospace, LLC is a space technology company specializing in the research, development and construction of habitable space structures for both government and private use. The company has successfully launched two scaled-down spacecraft, Genesis I (2006) and Genesis II (2007). In 2016, the company launched the Bigelow Expandable Activity Module (BEAM), and in 2017 it was awarded a mission extension by NASA to continue work on the International Space Station (ISS). The company also designed the B330 expandable spacecraft, a commercial habitat designed to help research the technology and eventually serve as an independent space station. The company also recently previewed a large-scale space station prototype called Olympus.



PROFILE: SCIENTIFIC GAMES

Scientific Games is a technology company involved with the research, development and application of gaming and lottery services for companies worldwide. The company relocated its headquarters from New York City to Southern Nevada in 2015 after acquiring Bally Technologies, Inc. in 2014. At the time, the move to Las Vegas brought an additional 200 jobs to the area, including employees from its headquarters and those working in research and development. The company maintains a strong footprint in Southern Nevada, where more than 30 percent of its total workforce is located.

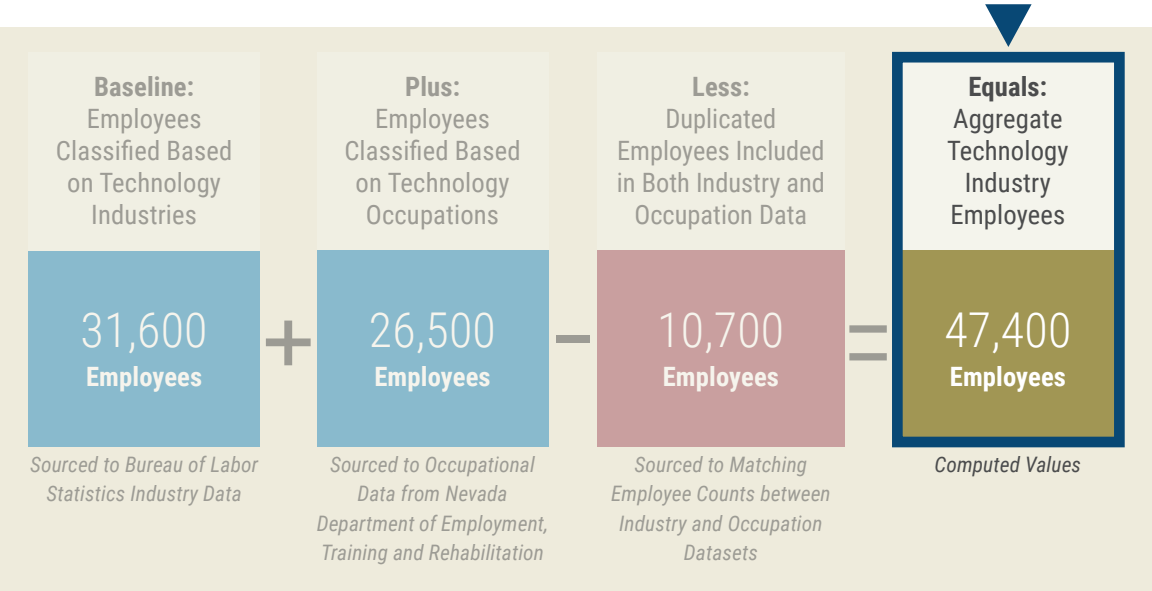
AGGREGATE TECH INDUSTRY

Technology is ubiquitous in today's business world, which creates a challenge in defining the tech industry in Southern Nevada. The method used in this report to quantify tech industry metrics relies on a three-pronged approach.

The first prong identifies a set of tech industries based on their industry classification codes. Companies such as Cox and Switch employ workers, those employees earn wages and that business generates economic activity. Employees of these types of companies employ both technology occupations (e.g., computer programmers) and support positions (e.g., human resources or finance staff). The employees of these industry-specific companies are sourced to the technology industry and are classified as such (they are referred to as "technology industry companies").

The second prong classifies tech workers based on their occupations. These occupations include computer programmers, database administrators and about 50 other occupational classifications. Employees included in this method span industries throughout the Southern Nevada economy. For example, MGM Resorts International employs technology personnel who are responsible for managing customer databases, developing web technologies or operating a complex web of servers, slot machines and software. Technology occupation employees working at MGM Resorts would not be included in the data collected in the first prong because the company is not classified as a tech company.

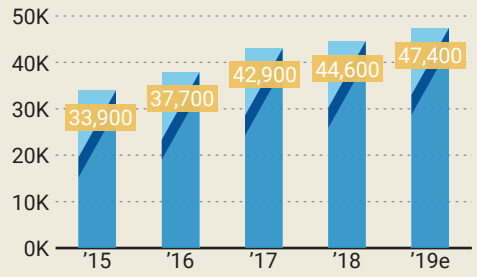
Not surprisingly, there are a number of technology occupation employees who are working at technology industry companies who would be included in both of the datasets above. To account for this overlap and avoid double counting employees, the third prong of the analysis identifies the number of people who are technology occupation employees working at technology industry companies and removes them from the total. This aggregate technology industry employment number represents all technology occupation employees regardless of company and all non-technology occupation employees working at a technology industry company.



The overall tech industry has demonstrated its ability to expand in response to demand within Southern Nevada. Since 2015, technology employment has grown by 39.7 percent, reaching approximately 47,400 in 2019. Perhaps more impressive is the rate at which salaries and wages within the industry have increased. In 2015, total wages within the technology industry stood at $2.4 billion. By 2019, total wages reached an estimated $3.6 billion, increasing by an impressive 47.9 percent, or a compound annual growth rate of 10.3 percent.

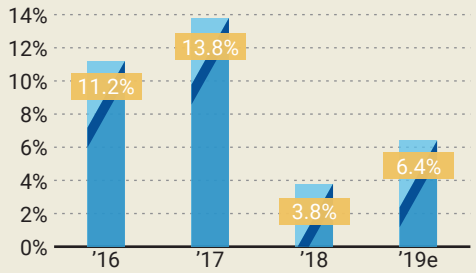
AGGREGATE TECH **EMPLOYMENT**

Las Vegas MSA



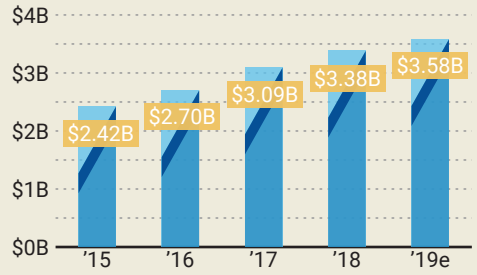
AGGREGATE TECH **EMPLOYMENT GROWTH**

Las Vegas MSA



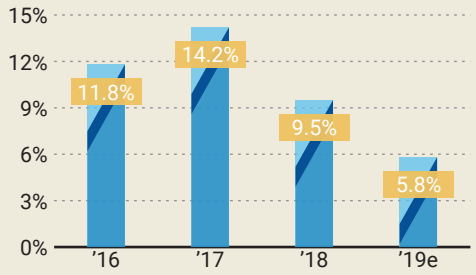
AGGREGATE TECH **WAGES**

Las Vegas MSA



AGGREGATE TECH **WAGE GROWTH**

Las Vegas MSA





McCarran International Airport has further embraced technology in recent years to streamline and enhance security and customer service functions. Innovations recently rolled out include holograms that give passengers directions and automated screening lanes that expedite the security process. Most recently, McCarran hosted a Transportation Security Administration trial of facial recognition technology, which was designed to test how accurately photos of passengers taken at checkpoints can be compared to identification documents.

ECONOMIC IMPACTS

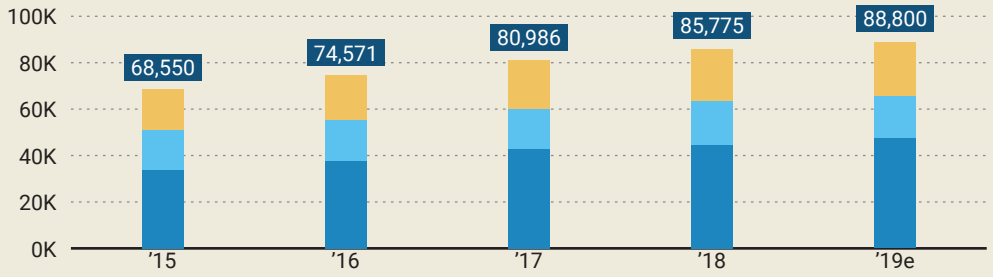
From paying employee wages to spending on vendor supplies and services, each dollar that a manufacturing or logistics company spends in operations ripples throughout the community, multiplying the economic benefits of that front-end output. The magnitude of those multiplier effects is estimated using IMPLAN, a nationally recognized model for projecting the total economic benefits of a business or industry. The model starts with a business's direct revenue and, based on the industry, estimates the ripple effects on overall economic activity, total employment and employee wages and benefits.

Those effects are categorized as direct, indirect or induced. Direct effects capture the economic output, jobs and labor income directly generated by the business. Indirect effects account for economic output, jobs and labor income produced through the purchase of goods and services from suppliers. Finally, induced effects reflect the economic activity and jobs produced by the earnings company workers spend in the community, for example shopping at the grocery store, going to the movies or visiting a doctor's office. The direct, indirect and induced effects are combined to determine the total economic impact a business has on the community.

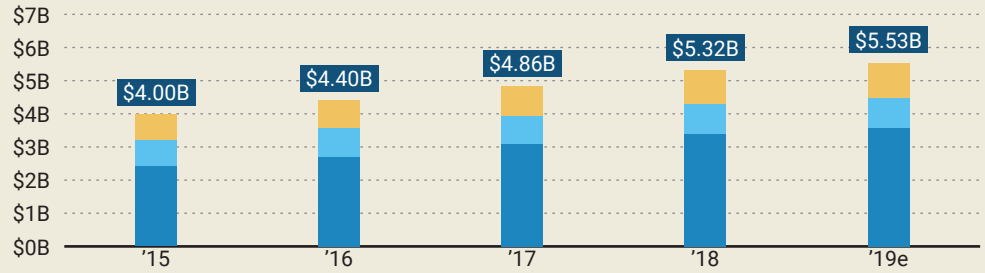
2019 ECONOMIC IMPACTS

Total Jobs 88,800 **EMPLOYMENT**	Total Wages and Salary $5.5B **LABOR INCOME**	Total Economic Activity $15.1B **ECONOMIC OUTPUT**
Direct 47,400	Direct $3.6 B	Direct $9.1 B
Indirect 18,100	Indirect $0.9 B	Indirect $2.6 B
Induced 23,300	Induced $1.1 B	Induced $3.5 B

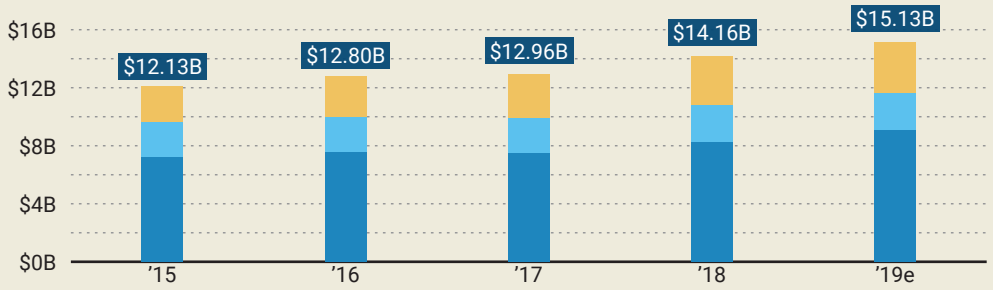
TOTAL TECH **EMPLOYMENT IMPACTS**



TOTAL TECH **LABOR INCOME IMPACTS**



TOTAL TECH **ECONOMIC OUTPUT IMPACTS**



Direct Effect Indirect Effect Induced Effect

Sources: IMPLAN, Applied Analysis, Bureau of Labor Statistics (dollars stated in year of expenditure).

Note: IMPLAN is 1 of 3 nationally recognized impact analysis software tools. It was developed by Minnesota IMPLAN Group, Inc. and used by more than 1,000 public and private institutions. IMPLAN is an input-output model that utilizes complex economic equations to explain how the "outputs" of one industry become the "inputs" of others, and vice versa. In economic impact modeling, the outputs of one industry become the inputs of others, and vice versa. This relationship is sometimes referred to as the "multiplier effect", illustrating how changes in one sector of the economy can affect other sectors. Generally speaking, these effects are segmented into direct impacts, indirect impacts and induced impacts.



GEOTAB®
management by measurement

PROFILE: GEOTAB, INC.

Geotab provides a fleet tracking platform and vehicle GPS for businesses to help collect and manage data from company vehicles. Geotab provides software that is scalable and customizable so businesses of all sizes can tailor the platform to their specific needs. The company, headquartered in Ontario, CA, decided to expand operations to Southern Nevada in 2019. The expansion will bring roughly 500 jobs to Southern Nevada.

ARISTOCRAT

PROFILE: ARISTOCRAT TECHNOLOGIES, INC.

Aristocrat Technologies has been operating in Nevada since the early 2000s, using creativity and innovation to develop and rollout new gaming technologies, including land-based and digital casino games. The company is actively developing online social and premium paid games through subsidiary companies such as Big Fish, a publisher of free-to-play mobile and desktop games. The company is heavily involved with developing new concepts and products, with over 1,265 patents granted, 3,099 trademarks and 130 copyrights.



COMPARATIVE ANALYSIS

SOUTHERN NEVADA AND THE NATION

Recent trends for Southern Nevada's tech industry have compared favorably with national trends, particularly in terms of growth. Tech industry employment growth in the region has topped the national rate in each of the past four years, and on a cumulative basis, Southern Nevada tech employment expanded by 45.6 percent between 2015 and 2019, outpacing the national rate of 9.5 percent. Regional establishment growth has been more in line with national trends, as Southern Nevada's cumulative growth rate of 16.2 percent trailed the national rate of 18.8 percent.

TECH INDUSTRY JOB GROWTH
2015-2019

9.5%
United States

45.6%
Southern Nevada

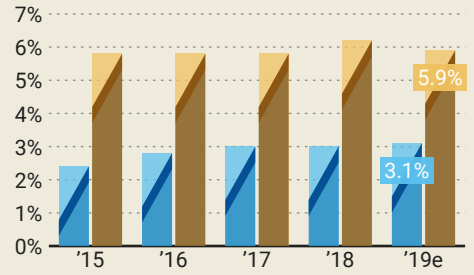
Compared to the rest of the nation, Southern Nevada has a slightly higher concentration of tech businesses, with tech establishments accounting for 6.2 percent of total establishments in the region versus the 5.7 percent national share. Although the national tech establishment share trails Southern Nevada's, the relative trend reverses in terms of tech employment shares. The share of tech industry employment in Southern Nevada has hovered at just 2.0 percent over the past five years, with a 2.3 percent share in 2019. By contrast, the national tech employment share has hovered near 6.0 percent with a 5.9 percent rate in 2019.

Beginning in 2018, the Regional Transportation Commission of Southern Nevada and INRIX began working together with a technology platform called Road Rules to digitally log infrastructure and its unique components such as speed limits, crosswalks and traffic signals in Southern Nevada. By using Road Rules, cities can prepare for the increased use of autonomous vehicles by digitizing their roadways and infrastructure. The technology is used by vehicles to help keep pedestrians and vehicles themselves safe while operating. Currently, this technology is only available in a few smaller areas like the Las Vegas Convention Center, but streetscape data will continue to be refined, with new areas being digitally mapped to prepare for this emerging industry.



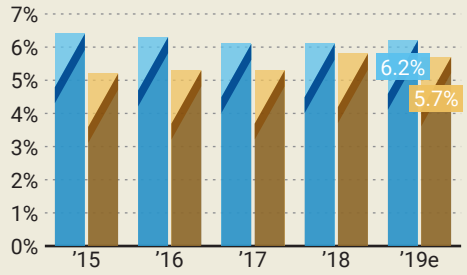
TECH INDUSTRY **SHARE OF EMPLOYMENT**

U.S. Comparison



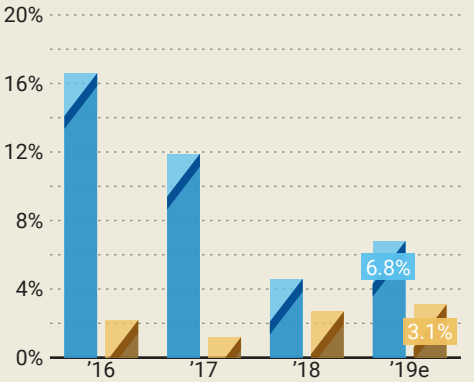
TECH INDUSTRY **SHARE OF ESTABLISHMENTS**

U.S. Comparison



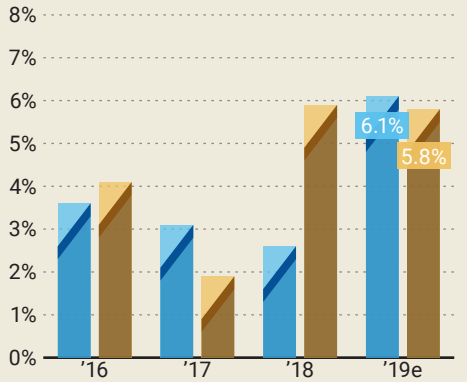
TECH INDUSTRY **EMPLOYMENT**

Annual Growth 2015 - 2019



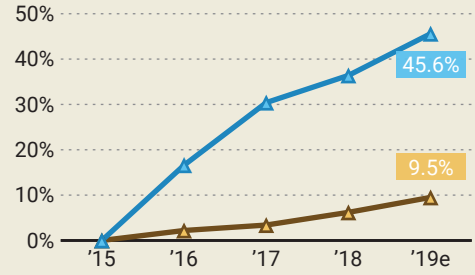
TECH INDUSTRY **ESTABLISHMENTS**

Annual Growth 2015 - 2019



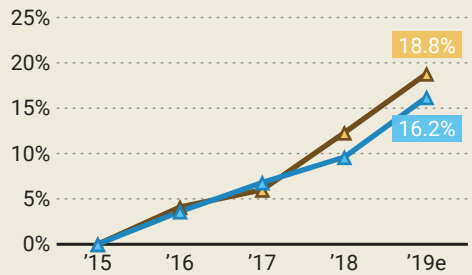
TECH INDUSTRY **EMPLOYMENT**

Cumulative Growth 2015 - 2019



TECH INDUSTRY **ESTABLISHMENTS**

Cumulative Growth 2015 - 2019



Las Vegas MSA U.S.

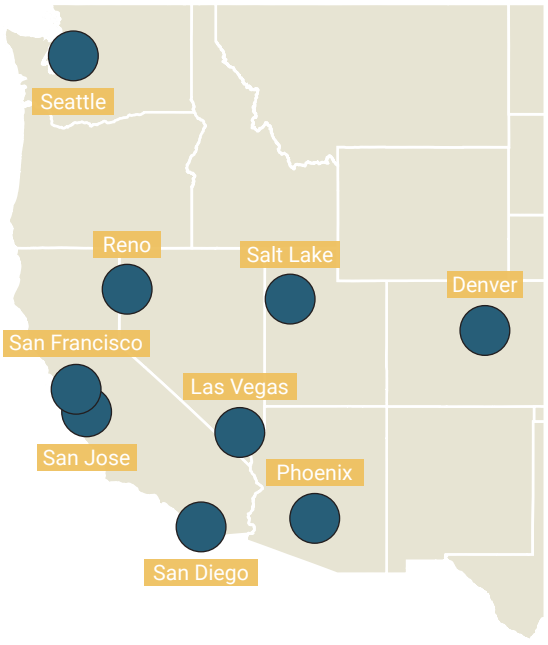
Source: U.S. Bureau of Labor Statistics

SOUTHERN NEVADA AND THE WEST

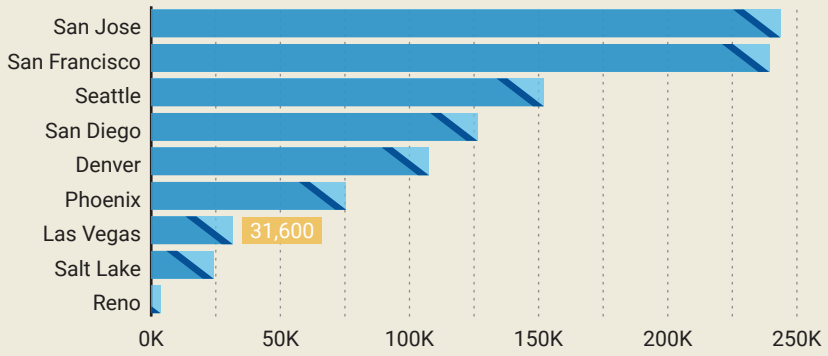
Industry Trends

In relation to comparable metropolitan areas throughout the western United States, Southern Nevada does not rank favorably for many measures of the tech industry. For measures of overall employment, wages and establishments, Southern Nevada registers lower marks than most other metro areas.

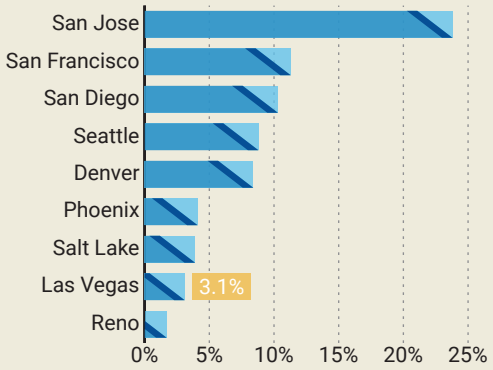
Southern Nevada's relative position in growth measures, as noted earlier in this report, improves markedly by comparison. The region ranked fourth highest for both industry employment growth and wage growth since 2015.



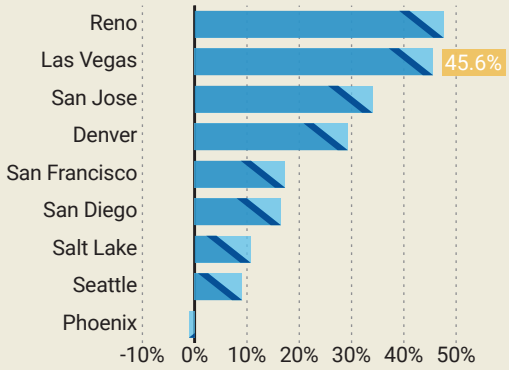
TECH INDUSTRY
EMPLOYMENT
MSA Comparison



2019 TECH INDUSTRY
SHARE OF EMPLOYMENT
MSA Comparison



TECH INDUSTRY
EMPLOYMENT GROWTH
2015 to 2019 | MSA Comparison



Source: U.S. Bureau of Labor Statistics

LVGEA



CASCADE FinTech

PROFILE: CASCADE FINANCIAL TECHNOLOGY

Cascade Financial Technology, which started as a prepaid card company, is now a program management company that provides a banking platform and related services to clients in the financial tech industry. The company made the move from Chatsworth, CA, to Nevada in 2016, moving all of its California-based jobs to Las Vegas. CEO Spencer Schmerling noted in a statement, "With a 24/7 call center, it is great to be in a 24/7 town that offers a well-trained workforce and convenient commuting options for employees." The company announced in 2018 plans to expand the business in Southern Nevada, bringing a projected total of 300 jobs to the area over a five-year span.

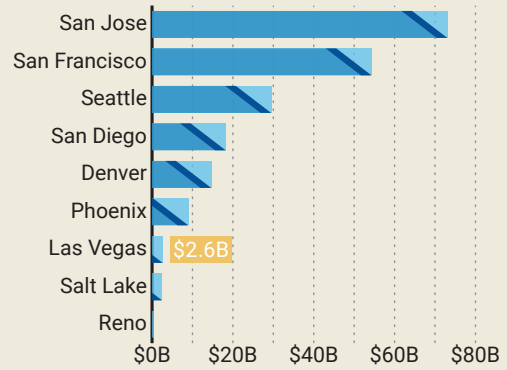
amazon

PROFILE: AMAZON

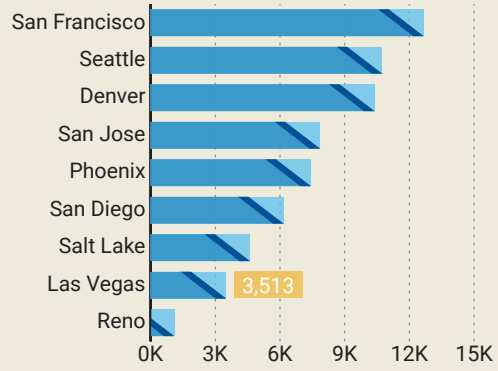
Amazon is a global giant in the technology world that focuses on digital media, e-commerce and artificial intelligence. Originally founded in Seattle, Washington, Amazon has expanded across the United States and around the world. The Amazon locations in Southern Nevada are focused on delivery and fulfillment of customer orders. In addition to several buildings in the Northgate Distribution Center, the tech giant has an 855,000-square-foot fulfillment center near the Las Vegas Motor Speedway. Furthermore, Amazon has another 600,000-square-foot fulfilment center under construction near the Henderson Executive Airport.



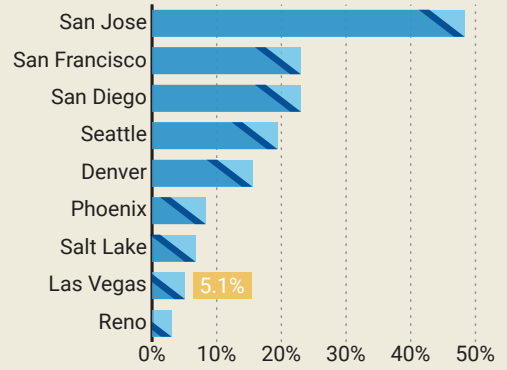
TECH INDUSTRY TOTAL WAGES
MSA Comparison



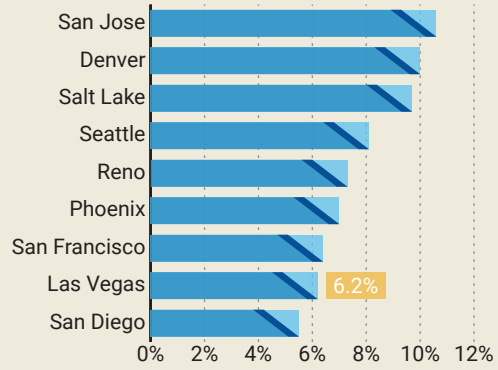
TECH INDUSTRY ESTABLISHMENTS
MSA Comparison



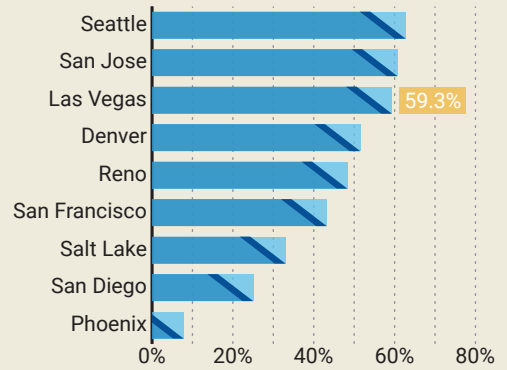
TECH INDUSTRY SHARE OF TOTAL WAGES
MSA Comparison



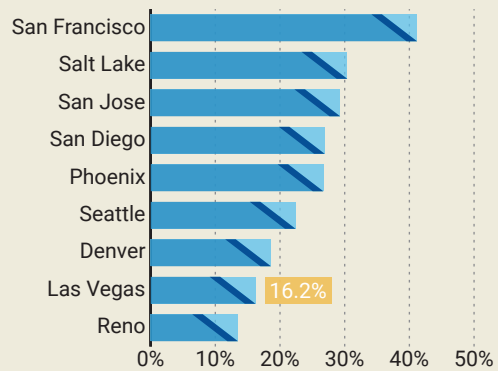
TECH INDUSTRY SHARE OF ESTABLISHMENTS
MSA Comparison



TECH INDUSTRY WAGES GROWTH RATE
2015 to 2019 | MSA Comparison



TECH INDUSTRY ESTABLISHMENTS GROWTH RATE
2015 to 2019 | MSA Comparison

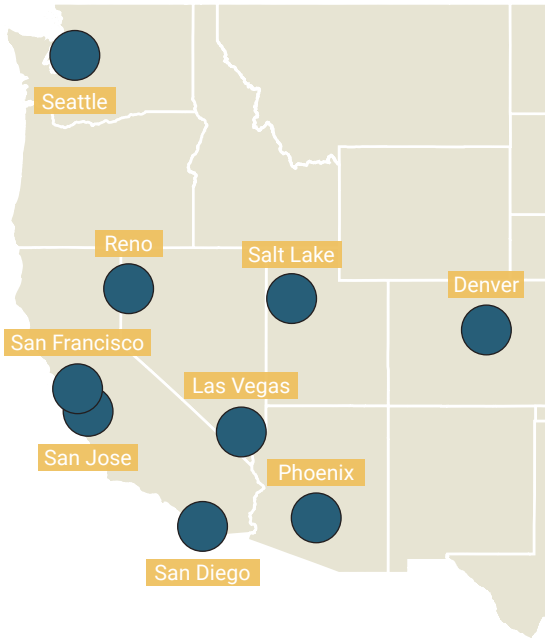


Source: U.S. Bureau of Labor Statistics

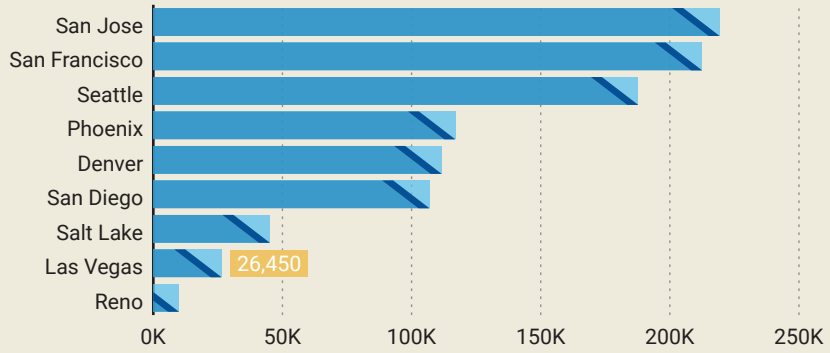
Occupational Trends

In addition to the noted trends in technology industry data by metropolitan area, occupational data trends reflected the same general rankings.

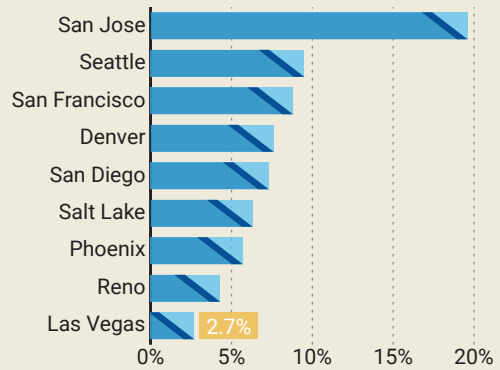
The Las Vegas metro area ranked relatively low in occupational employment relative to other markets within the western United States. Perhaps more important is where Southern Nevada ranks in terms of growth - demonstrating the ability to close the gap relative to other communities. Since 2015, technology occupational employment growth ranked as the third fastest growing metro area.



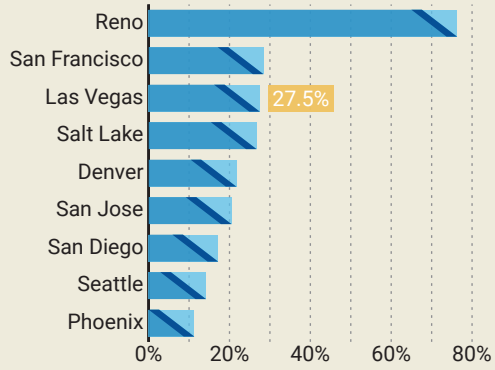
TECH OCCUPATIONAL **EMPLOYMENT** MSA Comparison



TECH OCCUPATIONAL **EMPLOYMENT AS SHARE OF TOTAL EMPLOYMENT** MSA Comparison

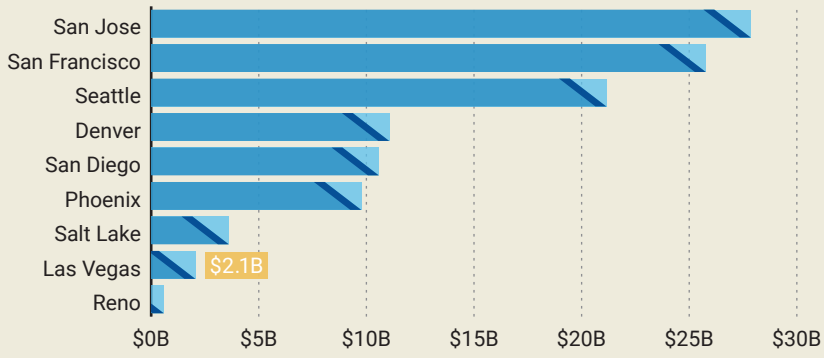


TECH OCCUPATIONAL **EMPLOYMENT GROWTH RATE** 2015 to 2019 | MSA Comparison

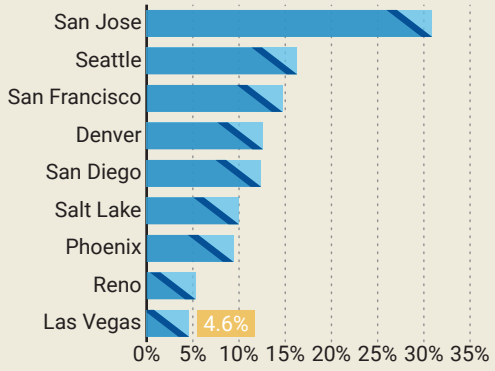


Source: U.S. Bureau of Labor Statistics

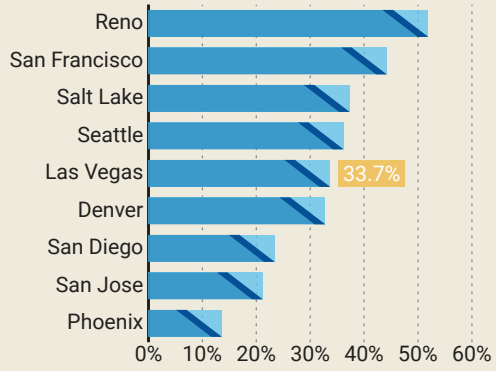
TECH OCCUPATION **WAGES**
MSA Comparison



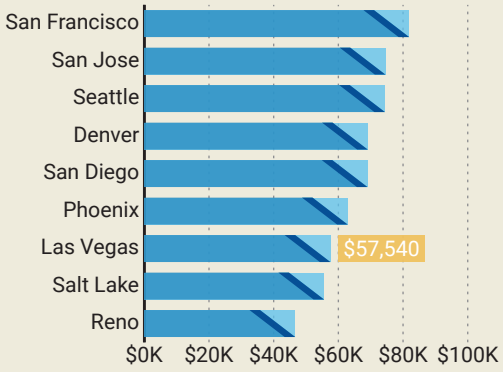
TECH OCCUPATION **WAGES AS SHARE OF TOTAL WAGES**
MSA Comparison



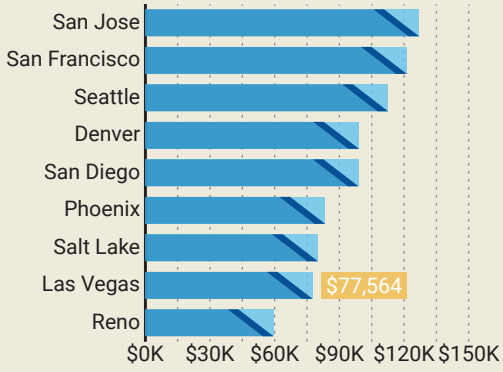
TECH OCCUPATION **WAGES GROWTH RATE**
2015 to 2019 | MSA Comparison



TECH OCCUPATIONS **MEDIAN WAGE**
MSA Comparison



TECH OCCUPATIONS **AVERAGE WAGE**
MSA Comparison



Source: U.S. Bureau of Labor Statistics

ALICE™ VIRTUAL RECEPTIONIST

PROFILE: WINTECH, LLC

Based in Las Vegas, WinTech is known for A.L.I.C.E. (A Live Interactive Customer Experience), the virtual receptionist technology. ALICE is a visitor management businesses solution that allows businesses to process visitors to their building more efficiently. WinTech has been located in Southern Nevada since 2011 and recently took steps to expand its operations in Las Vegas. The company has over 300 commercial and government clients both within and outside the United States.





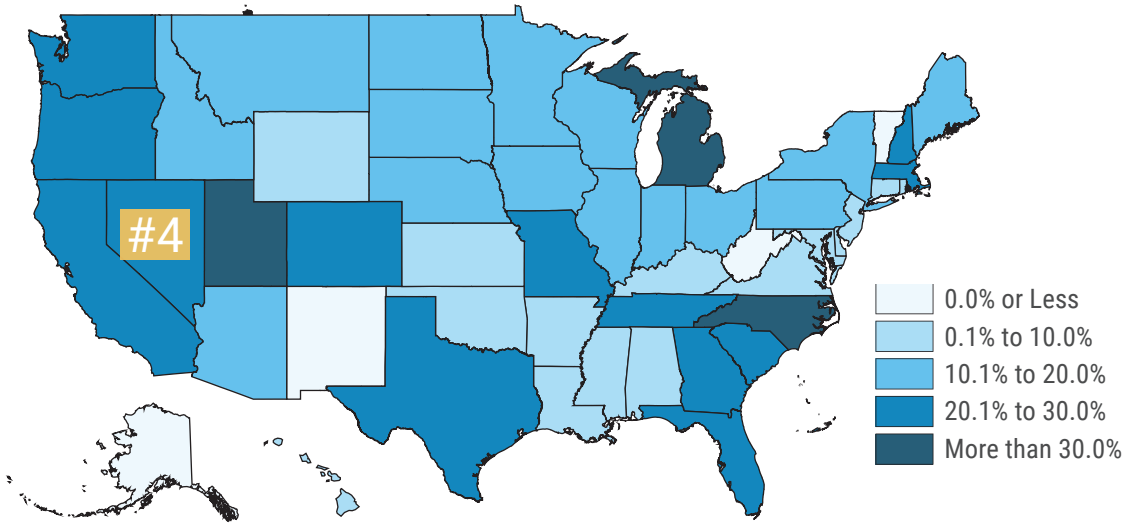


Happie Home

PROFILE: HAPPIE HOME, INC.

Establishing its headquarters in Southern Nevada in 2019, Happie Home Inc. is using digital technology to improve caregiving for the roughly 44 million people in the U.S. who provide caregiving services to family members. The company uses technology that allows caregivers to remotely monitor and support family members while also enhancing independence for those needing care. The technology provides caregivers with the hardware, software and artificial intelligence to provide better care remotely all in one package. Happie Home is also optimized to help loved ones independently monitor some of their own needs, such as tracking important events and medication information.

TECH EMPLOYMENT GROWTH (2010 TO 2018)



2010 - 2018 TECH **EMPLOYMENT GROWTH**

RANK	STATE	EMPLOYMENT GROWTH
1	Utah	39.4%
2	Michigan	36.4%
3	North Carolina	33.9%
4	**Nevada**	**28.6%**
5	Oregon	27.2%
6	South Carolina	26.9%
7	Washington	26.8%
8	California	25.4%
9	Georgia	23.2%
10	Colorado	23.1%

2010 - 2018 TECH **EMPLOYMENT GROWTH**

RANK	MSA	EMPLOYMENT GROWTH
1	San Francisco	62.4%
2	Raleigh	60.1%
3	Charlotte	48.2%
4	Austin	40.3%
5	San Jose	38.1%
6	Nashville	37.2%
7	Detroit	37.2%
8	Salt Lake City	31.9%
9	Seattle	31.5%
10	**Las Vegas**	**30.7%**

Source: Cyberstates 2019, CompTIA

INDUSTRY OUTLOOK

The outlook for Southern Nevada's technology industry remains strong, building on recent growth trends. Official state projections forecast the addition of 5,400 new jobs in tech-related occupations by 2026, with the most growth forecast for computer programmers. Other top-growing occupations cover a broad array of occupational specialties, including audio and video equipment technicians, electrical engineers, computer systems analysts and database administrators.

5,400
NEW JOBS
In Tech-Related Occupations (2018-2026)

Long-range employment projections published by computer industry trade group CompTIA forecast Nevada and Las Vegas to rank second and third, respectively, in tech industry job growth through 2026, positioning the Silver State at the forefront of opportunity to attract and develop its tech workforce.

MOST PROJECTED JOBS ADDED BY TECH OCCUPATION

2018 to 2026 | Las Vegas MSA

OCCUPATION TITLE	2018	2026	JOBS ADDED
Computer Programmers	450	1,491	1,041
Audio and Video Equipment Technicians	2,380	3,019	639
Computer-Controlled Machine Tool Operators, Metal	-	498	498
Security and Fire Alarm Systems Installers	750	1,211	461
Electrical and Electronic Engineering Technicians	1,080	1,514	434
Computer Systems Analysts	1,360	1,767	407
Electronic Home Entertainment Equipment Installers	-	333	333
Database Administrators	470	761	291
Web Developers	500	784	284
Architectural and Engineering Managers	500	777	277

Source: Nevada Department of Employment, Training and Rehabilitation

PROJECTED FASTEST-GROWING TECH OCCUPATIONS BY PERCENTAGE

2018 to 2026 | Las Vegas MSA

OCCUPATION TITLE	2018	2026	JOBS ADDED	% GROWTH
Computer Programmers	450	1,491	1,041	231.3%
Computer Operators	80	222	142	177.5%
Mechanical Engineering Technicians	30	72	42	140.0%
Industrial Engineers	140	288	148	105.7%
Computer Hardware Engineers	80	163	83	103.8%
Database Administrators	470	761	291	61.9%
Security and Fire Alarm Systems Installers	750	1,211	461	61.5%
Aerospace Engineers	300	483	183	61.0%
Web Developers	500	784	284	56.8%
Engineers, All Other	340	529	189	55.6%

Source: Nevada Department of Employment, Training and Rehabilitation



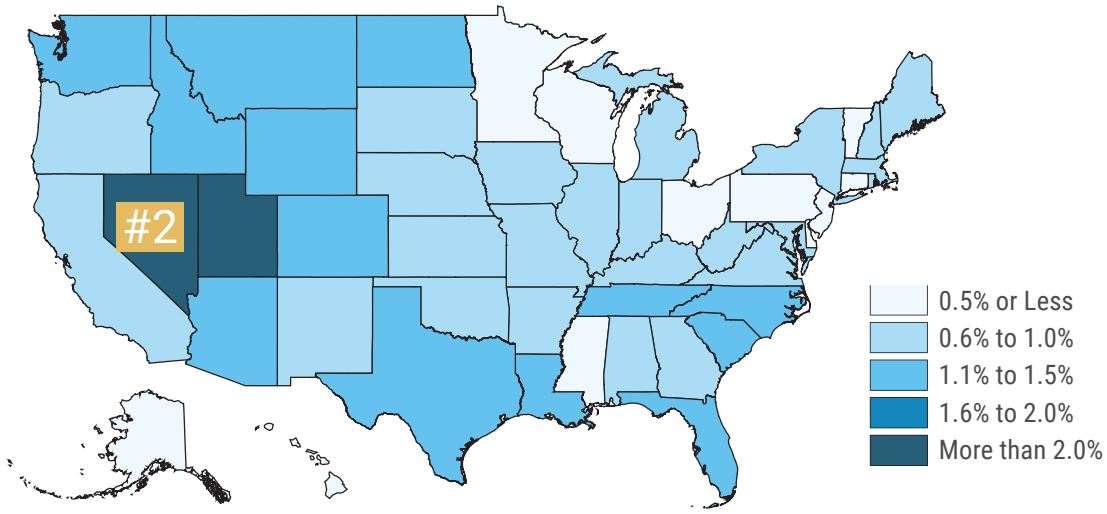
vadatech
THE POWER OF VISION

PROFILE: VADATECH

VadaTech designs and manufactures embedded computing solutions, including board-level products, chassis-level platforms and software. The company maintains expertise in various areas of technology and computing systems to serve customers in a number of fields, including industrial automation, medical, military and aerospace. VadaTech prides itself on bringing the newest technologies to their customers, deploying new products tailored to their clients to maximize efficiency and minimize costs, and manufacturing products in Southern Nevada.

PROJECTED TECH **EMPLOYMENT GROWTH**

2018 to 2026



PROJECTED TECH **EMPLOYMENT GROWTH**

2018-2026

RANK	STATE	EMPLOYMENT GROWTH
1	Utah	21.8%
2	Nevada	20.4%
3	South Carolina	14.2%
4	Colorado	13.5%
5	Texas	13.3%
6	Wyoming	13.2%
7	Idaho	13.1%
8	North Carolina	12.2%
9	Washington	11.5%
10	Montana	11.3%

PROJECTED TECH **EMPLOYMENT GROWTH**

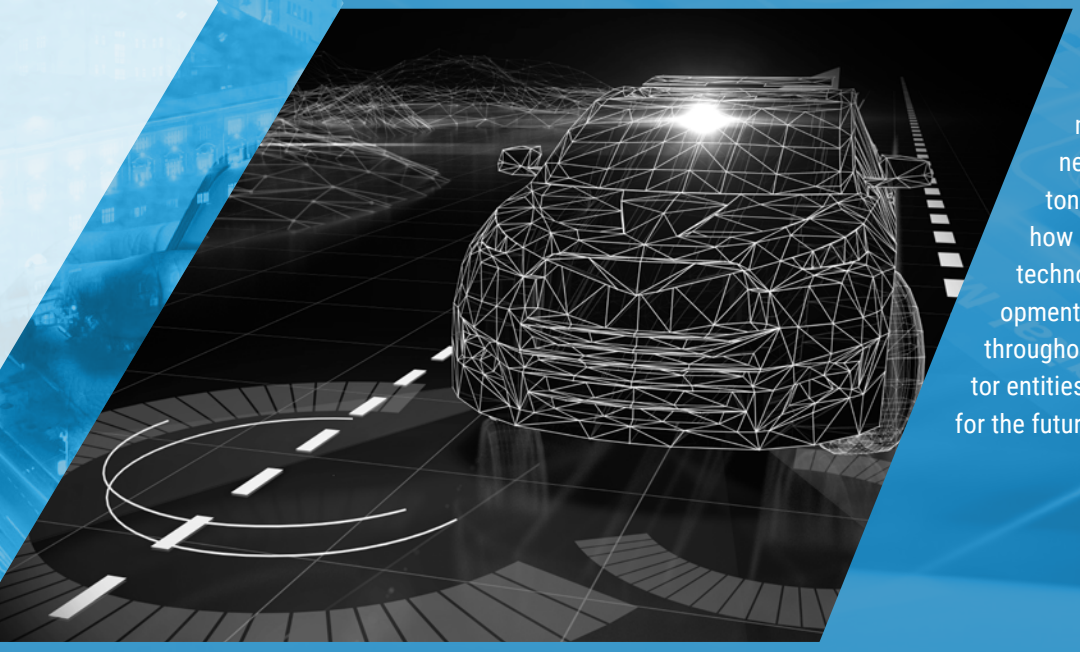
2018-2026

RANK	MSA	EMPLOYMENT GROWTH
1	Austin	20.2%
2	Salt Lake City	18.6%
3	Las Vegas	16.9%
4	San Francisco	16.0%
5	Denver	15.0%
6	Nashville	14.9%
7	Raleigh	14.1%
8	Orlando	13.4%
9	San Antonio	12.9%
10	Charlotte	12.2%

Source: Cyberstates 2019, CompTIA

EMERGING TECHNOLOGIES

Technology is an essential part of daily life and continually changes how people access information, communicate and go about their daily lives. The technology industry as a whole is expanding, adapting and evolving faster than ever before. More businesses are becoming tech companies and there will continue to be tremendous growth in the scope and function of technology in driving the economy. In preparation for these advancements, it will be necessary to consider how new tech applications will be utilized to shape the future workforce. There are several key areas in which the technology industry is expected to grow and develop new ways to use information and technology in the coming years. Taking advantage of these emerging technologies in Southern Nevada provides opportunities to strengthen the community's relative position within the broader tech landscape.



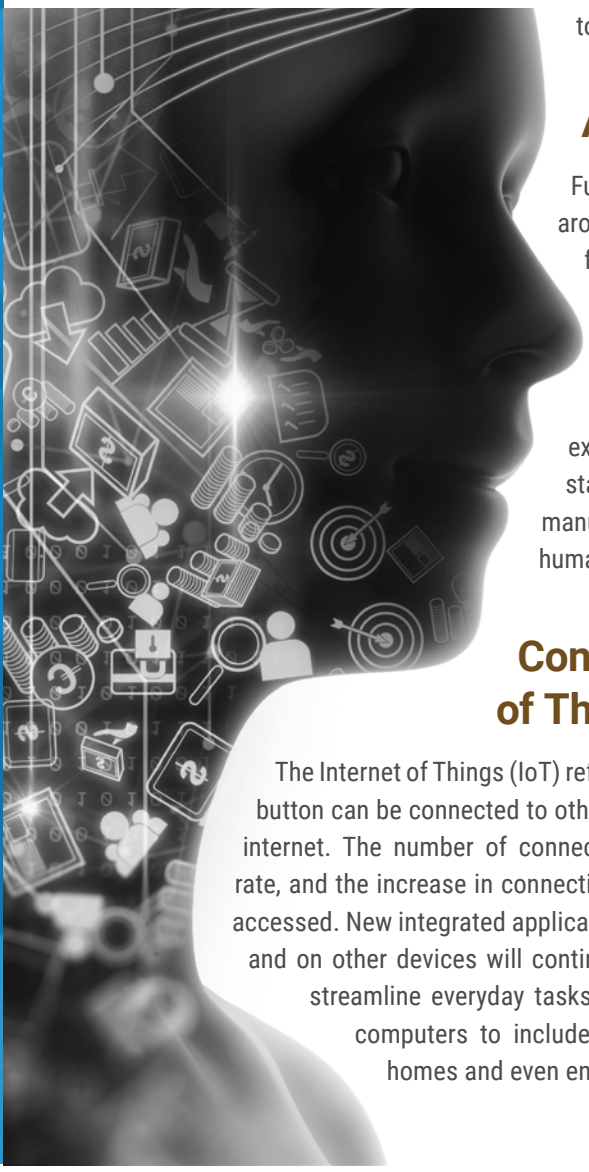
Autonomous Vehicles

The research and development of autonomous vehicles is at the visible forefront of new technology innovations. The use of autonomous vehicles will fundamentally change how people move and will require significant technological infrastructure investment. Development of this tech infrastructure is well underway throughout the country, with public and private-sector entities working in concert to build the foundation for the future of travel.



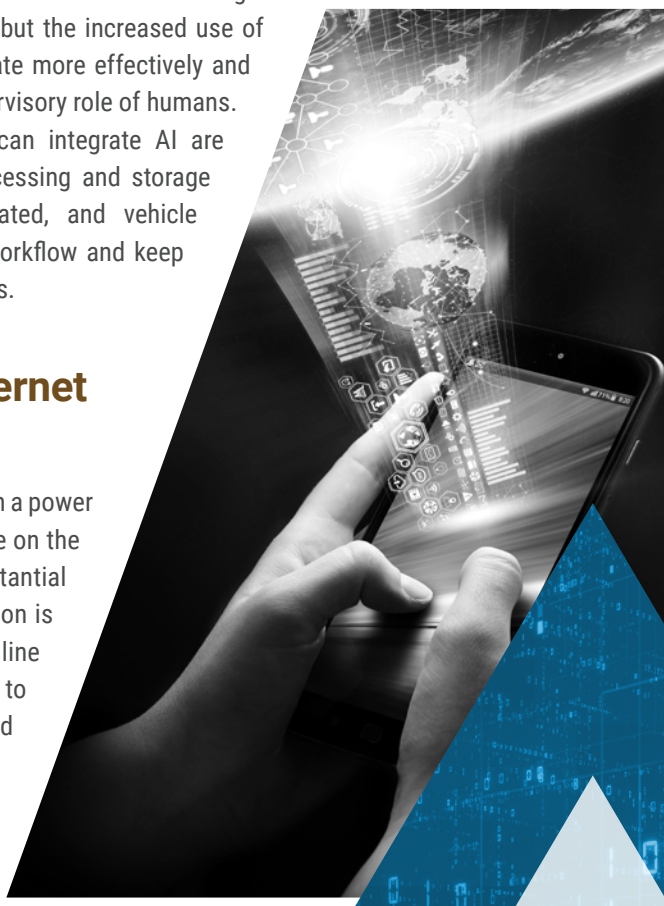
Aerospace and Defense

New technologies and innovations from the tech industry will continue to shape how national security is maintained and how space is explored. This will include expanding new technologies for combating cybercrime as well as enhancing established military technologies such as unmanned aircraft systems (UAS). Additionally, new solutions for more efficient means of space travel and operations are being researched and developed in the public and private sectors. Several private companies are exploring space travel solutions, as well as commercial space flights. The private sector is also progressing aerospace solutions to provide the first commercial flights to space.



Artificial Intelligence

Fully realizing the potential of new technologies will likely revolve around the ability to leverage the use of artificial intelligence (AI) for implementation. Some of the most innovative technologies still require human management, but the increased use of AI will allow businesses to operate more effectively and efficiently by minimizing the supervisory role of humans. For example, data centers that can integrate AI are expected to be able to manage processing and storage standards while being fully automated, and vehicle manufacturers can use AI to manage workflow and keep humans safe while working next to robots.



Connectivity and the Internet of Things (IoT)

The Internet of Things (IoT) refers to the concept that anything with a power button can be connected to other devices and information available on the internet. The number of connected devices is growing at a substantial rate, and the increase in connectivity has transformed how information is accessed. New integrated applications that leverage data available online and on other devices will continue to increase the use of devices to streamline everyday tasks. Connected devices extend beyond computers to include cars, wearable technology, smart homes and even entire cities.



Data Storage and Processing

With the growth in the IoT, massive amounts of data are created daily. It takes significant processing capability to make that data accessible for the end user. Large data centers are being designed to accommodate the needs of today while anticipating the future growth of the industry. Advancements in this industry will revolve around the need to effectively cool and power data centers while also pursuing green energy initiatives. Physical and cybersecurity measures will also continue to be a priority for data center businesses as they house sensitive and valuable information for their clients.



Automation in Manufacturing and Logistics

In order to make business operations more efficient, companies are increasing automation to manufacture products and provide services. This trend is expected to continue. Increased automation will shape the way workplaces are organized and operated. Automation is not just used to manufacture products. It can also be used to deliver them. Online retailers like Amazon are already using robots in warehouses to help fulfill purchase orders, and fully automated shipping operations are likely on the horizon.



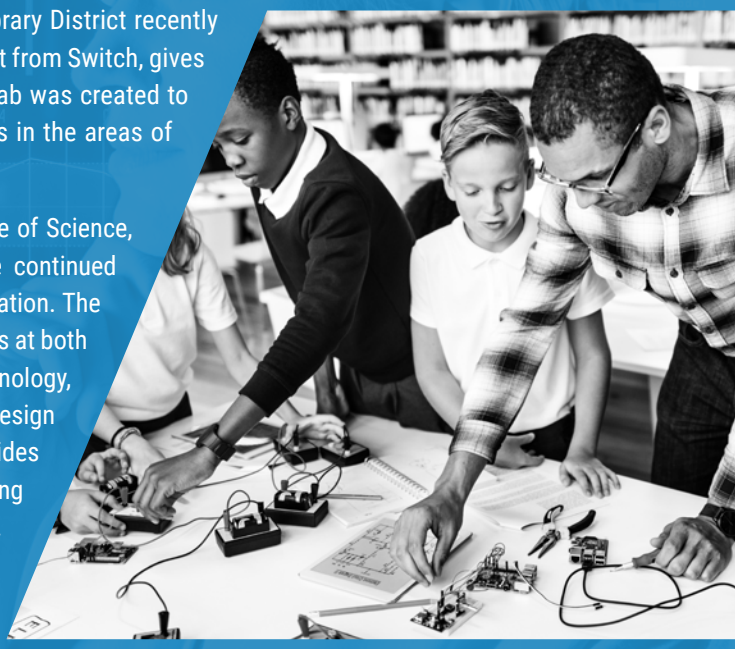
Telemedicine

Broad growth in both technology and healthcare has translated into innovative patient care delivery systems. According to Global Market Insights, the global telemedicine market was valued at over $38 billion in 2018, and the industry is expected to expand at a compound annual growth rate of 19.2 percent reaching a value of $130 billion by 2025. In the United States, the pace of expansion is even more staggering. Innovation in the healthcare and telemedicine industries is taking place on a daily basis; patient care will look much different five years from today.

THE NEXT TECH GENERATION

Preparing the next generation of Southern Nevadans for the tech industry of today and tomorrow is vital for the region's economic success. There are a number of programs and initiatives underway in Southern Nevada. The following highlights just a few that have the potential to help drive the pipeline of workers forward.

In a joint effort with the support of Switch, The Las Vegas-Clark County Library District recently opened the **Robot Lab Powered by Switch**. The lab, which is funded by a grant from Switch, gives users another space to experience science and technology products. The lab was created to further support the development of new learning environments for students in the areas of science and technology.



The **Engineering Fellows Program** supported by the Nevada Governor's Office of Science, Innovation & Technology was developed at the state level to support the continued growth and development of science and technology teaching in primary education. The program allows for 4th grade teachers to partner with engineering departments at both state universities in Reno and Las Vegas to integrate STEAM (Science, Technology, Engineering, Arts, Mathematics) concepts into existing curricula as well as design a kit with materials to help teach lessons during classes. This program provides primary educators with grade-specific guidance for teaching about engineering while also providing valuable tools necessary to facilitate classroom learning.

The Clark County School District has over 100 schools with a robotics program, giving students hands-on experience with designing, fabricating and operating robots. Teams from Cimarron-Memorial High School and Las Vegas Academy of the Arts have competed in the FIRST Robotics World Championships, an annual international robotics competition, with Cimarron's Team 987 awarded the Chairman's Award at the 2016 FIRST Robotics World Championship, the highest honor awarded at the competition. The award is given to teams that best exemplify sustained excellence and positive impact in the robotics community, serving as role models for other teams. Tesla awarded Cimarron with the first-ever Tesla Spark Inspiration Award for their efforts in robotics. The initiative includes a multi-year investment from Tesla, which started with a $1.5 million donation to schools in Nevada for the 2018-2019 school year.





UNLV is a leader in solar energy utilization through the efforts of the **Center for Energy Research**, leading a multi-institutional team that created innovative research in the solar-water nexus with the goal of generating solar energy without wasting precious water resources. UNLV has also received a Silver STARS (Sustainability, Tracking, Assessment and Rating System) rating by the Association for the Advancement of Sustainability in Higher Education (AASHE) for its campus-wide sustainability efforts.

The **UNLV Solar Decathlon Team** has produced good showings recently at the U.S. Department of Energy Solar Decathlon in 2013 and 2017 and looks for a strong finish again in 2020. The annual competition showcases solar powered homes that are designed and built by college students. In 2013, the UNLV entry finished first out of the American universities and second overall. In 2017, the UNLV entry was awarded the top prize in the innovation contest and finished eighth overall. UNLV is one of only 11 teams in the world that were selected to compete in 2020. The latest entry, Desert Bloom, is a 400- to 600-square-foot smart solar home designed specifically with military veterans in mind.



The **Black Fire Innovation Hub** is a 43,000 square foot hospitality and gaming technology lab. The lab houses replica resort settings (hotel rooms, casino floor, sports book, etc.) created by Intel, UNLV and Caesars Entertainment, which are used to study, develop, and test new hospitality industry ideas. The lab is located in UNLV's Harry Reid Research and Technology park that is developed in collaboration with the UNLV Research Foundation. The center maintains an emphasis on the student and helping them become tomorrow's innovators. In addition to mentorship and internship opportunities, UNLV will also hold hospitality and gaming classes at the site.



VirtualGuard
INTELLIGENT GUARDING SOLUTIONS

PROFILE: VIRTUAL GUARD

Virtual Guard provides video monitoring security services, specializing in integrating high-tech solutions for crime prevention for businesses. Virtual Guard's services are proactive, using state-of-the-art technology to protect businesses and prevent crime remotely, monitoring assets 24 hours a day, 7 days a week. Virtual Guard specializes in security services for businesses such as car dealerships, commercial buildings, construction sites, and warehouses. In 2018, the company relocated its corporate office from Los Angeles to Southern Nevada, bringing 125 new jobs to the area within five years.

Methodology and Assumptions

To evaluate the size of the "technology" or "tech" industry in Southern Nevada, a multi-phased approach to the analysis was completed. The analysis considered industry-specific data for companies that are classified within technology industries according to the Bureau of Labor Statistics. This component of the evaluation considered 55 NAICS (National American Industry Classification System) codes such as computer systems design services, custom computer programming services and software publishers. In addition, based on a review of known employers in the local market (Nevada Department of Employment, Training and Rehabilitation ("DETR") employer database), selected companies were manually re-classified into technology industries that are known predominantly as technology companies. This manual adjustment process accounts for reporting anomalies specific to Southern Nevada.

Following the industry-specific analysis, a secondary analysis of occupational wage data (sourced to DETR) was performed, and data for 49 occupations were aggregated. Occupations include a wide range of positions, including categories such as software developers, computer user support specialists and audio and video equipment technicians.

Finally, the two datasets (industry and occupation) were compared to one another, and any employees that would be included in both sets were eliminated to avoid double counting. The net effect of the calculations results in the aggregate tech industry data. It is also worth noting there are timing differences between data sets; both tend to lag. Both datasets reflect the latest available in 2019, and they have been shifted to better align for reporting purposes. Given the lag in the data releases, this shift likely results in conservative estimates in the reported years.



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