# Aligning Southern Nevada's K-16 Education-to-Workforce Pipeline for a New Economy

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# *Brief:* Aligning Southern Nevada's K-16 Education-to-Workforce Pipeline for a New Economy

*The following brief was written by CCEA and is provided as a supplement to the commissioned publication.*

During the latter half of 2022, the University of Nevada, Reno undertook a detailed, two-phase study of workforce development in Southern Nevada for the Clark County Education Association, particularly focusing on public K-16 education in the region that is provided by the Clark County School District (CCSD) and the Nevada System of Higher Education (NSHE). The first phase of the study, referred to as an "asset map", took inventory of the region's educational and supporting societal infrastructure; the second phase analyzed the accomplishments and challenges of CCSD and NSHE institutions in serving their student bodies and making use of the region's assets in order to form a progressive "education-to- workforce pipeline" leading to a more diversified economy in Southern Nevada.

This brief, written by CCEA, provides an introduction to the study along with summary recommendations for administrators, educators, and legislators; the two documents should be considered together. The following questions guided the report and brief:

1. What are the current and future workforce needs of a diversified Southern Nevada economy?
2. Does Southern Nevada's K-16 education-to-workforce pipeline align with occupations and industries that will lead to a more diversified economy?
3. What achievements, gaps, and obstacles currently exist in the Southern Nevada K-16 education-to-workforce pipeline?
4. What steps need to be taken to align and strengthen outcomes of that pipeline?

**1. Quantifying the Current and Future Workforce Needs**

Employment in Southern Nevada is forecasted to increase over 23% by 2030, which far outpaces the national employment forecast of 5.3%. Using data from the Nevada Department of Employment and Rehabilitation (DTER), UNR researchers examined occupations that are of particular economic importance locally: those that are already well developed, in which the region specializes, and those that show potential for future development. Good paying local occupations that are specialized compared to the nation and forecasted to increase at a high level are those within engineering, health, education, construction, computer science, and management fields (see Table 8 for specifics), of which 74% require post-secondary education as an entry into the profession. Occupations that are already growing strongly compared to the nation and expected to increase by 2030 are those within manufacturing, logistics, business, medical, and

data analytics (see Table 10 for specifics), of which 93% require post-secondary education as an entry into the profession.

Currently, Nevada is ranked 42nd in the nation for economic diversification (see Table 1) and despite its large size Clark County is ranked 5th in the state diversification owing to its reliance on gaming and hospitality (see Table 25). In 2022, the Las Vegas Global Economic Alliance (LVGEA) released its Workforce Blueprint which identified 100 occupations to be developed, which broadly matched those of DETR. The majority of targeted occupations identified by both LVGEA and DETR, which lead to a diversified economy, require post-secondary education. Thus, Southern Nevada's economic diversification hinges on the existence of a workforce with the advanced skills and knowledge needed to succeed in the diverse, targeted occupations.

**2. Aligning the K-16 Education-to-Workforce Pipeline**

The Clark County School District faces a checkerboard of economic situations in the Las Vegas urban core (Figures 3, 4, 5), where almost half of all 53 high schools are designated "Title I", meaning they also receive Federal funding to serve students from households below the poverty line. Federally funded Career and Technical Education (CTE) programs support both academic and practical career-oriented learning in high schools and propel motivated students to accelerate their progression into universities and colleges through dual enrollment (DE) options. As the name implies, DE allows high school students to take college classes for credit; conversely, some college classes may satisfy high school graduation requirements. CTE programs and DE at all high schools (quantified in Appendices 4 through 8) are important vehicles for economically disadvantaged students to achieve better economic circumstances for themselves and their families.

Central to the alignment of the K-16 education-to-workforce pipeline is the existence of both CTE programs and DE options that offer students a career pathway into occupations. The alignment of CTE programs with targeted occupations occurs with the guidance of the Nevada Department of Education (see Table 24). However, the mere presence of CTE programs and DE options does not equate to equal opportunity. CTE and dual enrollment opportunities are quantified in Appendices 4 through 8, and the alignment of Clark County's workforce demands by high school graduates supply is available in Table 24. For these and other reasons, the annual number of high school graduates in CTE programs falls far short of the annual demand estimated, about 50% of that identified by LVGEA and only 20% of that identified by DETR.

**3. Achievements, Gaps and Obstacles in the Pipeline**

To understand the impact of CTE programs on student outcomes, data was collected for every high school student who attended CCSD between the 2018-19 and 2021-22 school years. The CTE "completers", those who completed three or more courses in a CTE program of study,

consistently outperformed students who were not completers (see Table 15). The average ACT score for CTE completers was 21.37, compared to 16.83 for other students; and 92% of CTE completers graduated, compared to approximately 70% for other students. It is without question that students who complete CTE programs experience higher academic outcomes than those who did not complete them.

However, unfortunately, the pipeline is not equitably accessible to all in the CCSD student population. Approximately 20% of eligible high school students who become CTE completers are most likely to be white males, without an Individualized Education Plan (IEP), and not in need of English language support (Table 15). Aligning demographic indicators with student outcomes reveals three disturbing facts: (1) female students who complete a CTE program *score lower* than those who do not complete the CTE program; (2) nonwhite students who complete a CTE program *score lower* on their ACT than white students; and (3) students who need English language support also *score lower* on their ACT than those who do not need the support. Demographic indicators are also reflected in students' high school success and access to career pathways: (1) as the median household income increases for CTE completers, their average ACT scores increase (Figure 11); and (2) as household/population density increases for CTE completers, their ACT scores decrease (Figure 12). These data suggest an accessibility gap in the current K-16 education-to-workforce pipeline (see Table 9).

Not only is the accessibility of CTE programs in question, but the availability of quality programs is also a concern. Successful CTE programs (see Table 20) are considered those with an increased completer-to-participant ratio and improved student outcomes (e.g., GPA, ACT, graduation). Although variability occurs within CTE programs, Southern Nevada needs to identify programs that lead to improved outcomes for all students, including our most diverse and economically disadvantaged.

Two further conclusions are important to note: (1) when the percentage of CTE completers at a school increases, the *school's* average score on the ACT also increases (see Figure 7); and (2) when the number of CCR diplomas at a school increases, the *school's* average ACT scores again increases (Figure 9).

One aim of CCSD CTE programs is to matriculate students into NSHE to pursue degrees (e.g., certificates, associates, bachelors) in targeted occupations, which increasingly require post-secondary credentials. NSHE institutions award approximately 15,000 associate and bachelor's degrees annually; over half of the recipients are expected to stay in Nevada. Comparing the NSHE degrees with the in-demand occupations identified by DETR (Table 22) reveals that less than half the advanced workforce needs of Clark County (alone) for the current decade will be met in-state (Table 24). The remaining workforce positions will need to be filled by in-migration, causing more stress on housing, public support, and education. Once in the workforce (with or

without post-secondary education), workers may need to continue their education to upskill or reskill themselves for their occupations.

**4. Strengthening and Aligning the K-16 Education-to-Workforce Pipeline**

In order to strengthen Southern Nevada's economy, we must diversify it, which means in turn diversifying the education-to-workforce pipeline. Nevada cannot continue with the status quo, investing in fragmented components of the workforce pipeline and waiting for change. Our state must purposefully and systematically align K-16 education, workforce, and economic development in order to grow our state.

The impact of CTE programs on student outcomes is significant, but it is not equitably accessible to all in the CCSD student population. Aligning demographic indicators with student outcomes reveals three disturbing facts: female students who complete CTE programs score lower on their ACT than those who do not complete CTE programs; (2) nonwhite students who complete CTE programs score lower on their ACT than white students who complete CTE programs; and (3) students who need English language support also score lower on their ACT than those who do not need additional language support. This accessibility gap extends to students who are economically disadvantaged and live in densely populated geographic areas who score lower on their ACT than their counterparts. The accessibility gap must be addressed to strengthen the K-16 education-to-workforce pipeline.

The UNR studies make numerous worthwhile recommendations throughout. CCEA believes that implementing these recommendations successfully will depend first on taking bold policy actions regarding the state's K-16 educational infrastructure, reflecting the fact that workforce development and public education play an integral role in the economic development and diversification of the state. In essence, public education and workforce development are the *foundation* for economic development and diversification.

Nevada's present K-16 education-to-workforce pipeline is insufficient in meeting Nevada's – even Southern Nevada's –occupational needs. To address this urgent problem, we propose three policy actions:

**Action 1:** *Prioritize funding for Nevada's K-16 education-to-workforce pipeline to diversify and strengthen economic development.*

> Nevada, particularly Southern Nevada, lags behind in economic diversification, largely due to historic reliance on the leisure and hospitality sector. Nevada's workforce pipeline is fragmented. Nevada has components of the pipeline (e.g., CTE programs and dual enrollment; apprenticeships), but they are not sufficiently integrated to prepare our workforce.

**Action 2:** *Expansion of successful K-16 education-to-career pathways to all Nevada's students, regardless of economic and geographic location.*

CTE programs and DE options are offered unevenly across CCSD schools. Consequentially, student achievement outcomes, program quality, and opportunities in high-demand, high-pay occupations across different school zones and demographic groups has been uneven, as shown by the qualitative and quantitative analysis in this report. Successful career pathway programs are those which result in high academic outcomes and include an alignment of CTE programs and DE options with in-demand occupations, and they exist within Southern Nevada. Utilizing successful K-16 education-to-career pathways to expand offerings across Nevada will result in students entering post-secondary and workforce with the knowledge and skills needed to build a diverse workforce and economy.

**Action 3** *Designate a lead agency to coordinate and support K-16 education-to-workforce pipelines statewide.*

Nevada has had a decentralized economic and workforce development system which has caused fragmentation in efforts and insufficiency in outcomes. A variety of organizations (see Phase I report) are active in workforce issues, but it is not clear if or how these actors work together. A central agency will align resources, ensure accountability within and between other agencies, and make certain workforce outcomes align with Nevada's economic development needs.

# Executive Summary

This report is for the second phase of a study commissioned by the Clark County Education Association to review Nevada's workforce development. Nevada is one of the least economically diversified states in the U.S. Workforce development and public education play an important role in the economic development and diversification of the state. We are listing below some of the takeaways from the study:

**Southern Nevada Occupation Forecasts**

- Employment in Southern Nevada is forecasted to increase from 960,895 in 2020 to 1,183,513 by 2030.
- Employment in Southern Nevada is forecasted to grow by a little over 23%, far outpacing the national average of 5.3%.
- Southern Nevada is forecasted to have an annualized employment growth rate of 2.07% between 2020 and 2030.
- Some of the occupations with the fastest forecasted percentage growth are the Entertainment Attendants and Related Workers (52.54%) and Animal Care and Service Workers (52.35%). Given the aging of the Southern Nevada population, the Occupational Therapy and Physical Therapist Assistants and Aides occupation is forecasted to grow by 51.10%.
- Southern Nevada occupations forecasted to have the two largest numeric increases from 2020 to 2030 are the Food and Beverage Serving Workers occupation with an increase of 18,369 and the Material Moving Workers occupations with an increase of 16,042.
- Similar to national trends, Southern Nevada is forecasted to have one of the smallest increases in occupations for Office and Administrative Support Occupations with 148 employees over ten years. Only two occupations are forecasted for negative growth from 2020 to 2030, these occupations are: (1) religious workers are decreasing by eight employees; and (2) communication equipment operators are decreasing by five employees.

- Five of the occupations within the top twenty of occupations by highest average annual wage are in the health sector. These top twenty occupations make up only 4.27% of total Southern Nevada employment.
- Most occupations that make up the lowest twenty by average annual salary are in the accommodations and food service sector. These twenty low average annual salaries makeup 15.53 % of total Southern Nevada employment.

**Targeted Occupation Analysis for Southern Nevada**

- LVGEA and its partners commissioned a third Workforce Blueprint working with the State of Nevada Governor's Office on Economic Development and Southern Nevada partners. The LVGEA Workforce Blueprint (2022) identified 100 occupations to be targeted in order to meet the labor force needs of the targeted industries.
- For many traditional economic development researchers and practitioners, regional economic analysis has meant examining only industrial strengths and weaknesses and developing strategies to replace declining industries and enhance county economic competitiveness.
- Recently, regional competitiveness has become increasingly dependent upon local knowledge bases and worker quality. Economic development activities that target occupations provide a different angle in formulating development targets. For instance, a computer programmer in one economic sector could transfer to another economic sector if needed.
- Workers who perform similar tasks can easily move between industries with minimal training, strategies that target sole industries may overlook occupation-based opportunities across industries. For this reason, economic development practitioners need to pay attention to the functions that local workers perform as to the output they produce.
- Using procedures outlined by Michael Porter for economic clustering, the 2022 Workforce Blueprint for Southern Nevada 100 occupations were clustered as Stars, Mature, Emerging, and Transforming occupations.
- Star occupations of the LVGEA 100 are characterized as occupations that have concentrated in Southern Nevada in 2020 and are forecasted to increase their

concentration in the area by 2030. Commercial pilots, civil engineers, and teachers in elementary and middle schools are examples of Star occupations.

- Mature occupations of the LVGEA 100 are characterized as occupations that have concentrated in Southern Nevada in 2020 but are forecasted to decrease their concentration by 2030. Financial managers, registered nurses, and surveyors are examples of Mature occupations.
- Emerging occupations of the LVGEA are characterized as occupations that have less concentration in Southern Nevada in 2020 but their concentration is forecasted to increase in 2030. Electrical engineers, mechanical engineers, and secondary school teachers are examples of Emerging occupations.
- Transforming occupations of the LVGEA 100 are characterized as occupations that have less concentration in Southern Nevada in 2020 and their concentration is forecasted to decrease by 2030. Lawyers, veterinarians, and general operations managers are examples of Transforming occupations.

**K-12 Education System in Clark County, 2019-2022:**

- The Federal CTE initiative provides substantial, recurring [annually >$12 million] funds for both secondary and post-secondary education in Nevada, which can be broadly directed to the State's particular economic development purposes.
- Within the State, CTE programs can be tailored to create a common path for both original workforce skilling in high schools, and subsequent re-skilling in community colleges on a continuing basis.
- Dual Enrollment between secondary and post-secondary institutions is an important feature of CTE programs, which can help guide Nevada high school students into NSHE and at the same time address teacher shortages in our high schools
- Improved data collection and reporting systems in support of CTE programs are needed to track/support students between Nevada high schools and NSHE institutions; persistent, common identifiers for both students and course offerings is essential

- The CTE Career Cluster framework provides a cogent and stable alternative to NAICS and SOC systems for planning workforce development; cross-walks back from those systems to the clusters will allow economic progress to be tracked via regular statistics

**Quantitative Analysis of K-12 Education Outcomes, 2019-2022**

Results from a quantitative analysis of the Career and Technical Education (CTE) programs in the Clark County School District are presented in this section. The School District is made up of 36 school zones. For this analysis, 168,471 students were pooled from the Clark County School District for the years 2019-2022. Sixty-six CTE programs were used in the analysis. Some takeaways from this section are:

- The average ACT score for the data on all students is 17.42 points with the range from 1 to 36. The average GPA at graduation is 2.739.
- The average amount of dual credits earned per 100 students is 2.74. Note that 165,519 students had zero dual credits. Only 2,886 students reported positive credits that ranged between 1 and 11. For those students, the average amount of dual credits are about 1.6 per student.
- Only 13,652 students (about 8% of total students) completed a CTE program. Out of those that completed CTE, 2,824 students (about 21% of total) completed more than one CTE program.
- About 12% of students have a college and career ready diploma. About 18% have a college and career ready or advanced diploma.
- 10.6% of the students received an individualized education and about 13% needed English language support.

We found significant differences between CTE completers and other students in terms of education outcomes and other demographic indicators. The notable differences are:

- The average ACT score for CTE completers is 21.37 compared to 16.83 for other students.

- The average GPA at graduation for CTE completers is 3.334 compared to 2.625 for other students.
- The average amount of dual credits per 100 students for CTE completers is 8.44 which is almost four times the credits for other students.
- There is also a big difference between the two groups in terms of college and career ready (or advanced) diplomas. 69.4% of CTE completers had college and career ready diplomas compared to only 7.32% of other students.
- CTE completers are also less likely to have received individualized education or need of English language support. They are also less likely to be nonwhite compared to those who did not complete a CTE program.
- In terms of other school zone control variables, CTE completers are more likely to be from a zone with higher median household income and lower population and housing density.
- The relationship between average ACT score and the estimated effect (regression coefficient) of the CTE program on ACT scores in school zones is estimated. There is a negative correlation between the variables. Those school zones with low average ACT scores tend to have bigger impact from CTE programs. One explanation of this could be because those low-performing school zones have more room to grow and benefit more from the CTE participation and the variety of CTE programs.
- There is even a higher positive correlation between average ACT score and the percent share of career and college ready diplomas in the school zones. There is also a similar positive correlation if Advanced Diplomas are added to the diploma share variable. Those students who have received career and college ready or advanced diplomas tend to have significantly higher ACT scores.

A regression analysis was completed using the full student dataset from the CCSD with ACT score as the dependent variable and CTE program completion and other indicators used as explanatory variables.

- The results show a consistently positive and statistically significant regression coefficient for the CTE completion variable. The estimated coefficient ranges from

0.858 to 2.513. Those students who have completed a CTE program have higher ACT scores by about 0.9-2.5 points.

- Students with college and career ready diplomas have higher ACT scores by about 4.3 to almost 5 points.
- Results show that nonwhite students have significantly lower ACT scores than others but those that have completed a CTE program have done better than those that did not participate in the CTE.
- Female students who have participated in CTE have even lower ACT scores compared to those that did not complete a CTE program.
- The CTE completers subsample was used to see if more STEM oriented CTE programs made a difference. Of interest, female students who have participated in the CTE have done better than those that did not.
- Within the CTE completers, students who have received a college and career ready diploma and earned dual credits have significantly higher ACT scores compared to other students.

A separate regression analysis for CTE program completion estimated for each school zone with other student indicators was also completed. Some of the key findings are:

- The school zones with the highest estimated coefficients (indicating greatest association between CTE and ACT score) are for Western, Cheyenne, and those schools that serve students countywide (County).
- The ones with the lowest estimated coefficients are Green Valley, Spring Valley, and Desert Oasis. For those three school zones, the estimated coefficients are negative indicating a negative association between CTE and ACT score. Note that there is a negative relationship between CTE coefficients and ACT scores, which were already pointed out earlier.

**Workforce Gaps**

- Based on both official DETR figures as well as those offered by the LVGEA, Southern Nevada's most obvious high-demand, high-paying jobs fall within three

CTE career clusters: Education & Training, Health Science, and Information Technology.

- Jobs in the Science, Technology, Engineering & Math (STEM) career cluster are high-paying but much less abundant.
- Conversely, the Hospitality & Tourism career cluster, which includes food service, gaming, and hotel management, is an important sector of long-standing and high employment in Nevada; but suffers from relatively low wages and recurrent booms-and-bust cycles, as well as being subject to increasing automation.
- Similarly, the Transportation, Distribution & Logistics career cluster, which includes warehousing and shipping, also long-established in Nevada, provides somewhat better wages but no particular future.

**Determining the Impact of Digital Technology on Occupations**

- Southern Nevada's workforce demands are minimally supported by the high school graduate supply. Exacerbating the deficient workforce pipeline that currently exists in Southern Nevada is the looming impact of digital technology on current occupations.
- Impacts of digitalization of the labor force will be destructive and transformative. The destructive effects of digitalization is that it seeks to substitute human labor while the transformative effects complement labor. Potential impacts of new digital technologies on the 100 occupations targeted by the LVGEA are Digital Rising Stars, Digital Machine Terrain, Digital Human Terrain, and Digital Collapsing occupations.
- Digital Rising Stars are occupations where transformation has a high impact, but these occupations do not lead to replacement or the risk of destruction is low. Medical, computer, and engineering field occupations are examples of Digital Rising Star occupations. In the future, these occupations must have continuous training to employ the latest computer and digital techniques. These occupations are critical to Nevada's new economy.
- Machine Terrain occupations have the double impact of being highly destructive and transformational. Engineering technicians, management analyst, and cost estimators whose jobs can be digitized are examples of Machine Terrain occupations.

- Human Terrain occupations are rather unlikely to be replaced by machines because of a low destructive effect but also a low transformative influence. Employees in these occupations possess skills that currently cannot be performed by machines and there is little need for human-machine interactions. Medical, and education occupations are examples of Human Terrain occupations. All education levels, primary, middle, and high school are human terrain occupations.
- Collapsing occupations are faced with high destruction and their activities may be replaced by machines. These occupations may be completely different in their activities and skills in the future. Surveyors; Installation, Maintenance, and Repair Workers; and Market Research Analyst and Marketing Specialists are examples of Collapsing occupations.

# I. Introduction

Workforce development is a key component of an economic development strategy, and it begins with the K-12 public education system. In a recent report by the Urban Institute, Eyster and Briggs (2016) highlight the importance of collaboration between state workforce and economic development activities. The authors discuss the role of government agencies and present the Nevada Governor's Office of Economic Development (GOED) as one of the cases where the direction of economic development is centralized under the Governor of a state. GOED and other state agencies and stakeholders also highlight workforce development as a particularly important part of Nevada's economic diversification strategy (Mauro, 2011; The Lincy Institute and Brookings Mountain West, 2022). Economic diversification is really important for Nevada as it is considered one of the least diversified states in the U.S. (see Table 1.1.). Hence, it is imperative to understand the gaps or weaknesses in our state workforce assets, which we examine in this study.

Clark County Education Association (CCEA) commissioned two studies from the College of Business at the University of Nevada, Reno to complete a review of Nevada's workforce development. The first phase of this study completed an asset map of the workforce in Southern Nevada. Assets related to the workforce included human capital, financial capital, industries, legal and regulatory environments, physical structure, and quality of life components. These assets were collected and listed in the Phase I report by Harris, Tosun, Hastings, Scavacini, Bowers, & Olesinski (2022). The goal of the Clark County Education Association's Phase II study is to identify gaps or weaknesses associated with the Southern Nevada workforce assets.

Phase II will:

1. Discuss the forecasted changes in economic activity and occupational demands in Southern Nevada for 2020-through 2030 to understand the demand side of the workforce.

2. Review the Clark County School District's involvement in Career and Technical Education (CTE) programs and the Nevada System of Higher Education (NSHE) to understand the supply side of the workforce.
3. Discuss educational programs to address these occupational demands within higher education to estimate any shortages of occupational supply in the future.
4. Understand the impact of digital technology on current occupations in Southern Nevada to strategically plan for the workforce of 2030.

This report is structured as follows. In the next section (section 2), we are discussing the K-16 to workforce pipeline in Nevada. In sections 3 and 4, we discuss employment, output and occupation outlook and forecast for Nevada and Southern Nevada, setting the stage for the workforce environment we are examining in this report. In this section, we are providing the demand side of the workforce through current and future employment in industries and occupations. We then turn to the supply side which is an overview and analysis of the education and training for those jobs. Section 5 provides a broader picture of the Clark County School District in terms of the geographic data and CTE analysis followed by a quantitative analysis of the CTE programs in Section 6 to show the relationship between CTE participation and student educational outcomes. Section 7 presents the discrepancies between future employment needs by career cluster categories and corresponding CTE completion. In section 8, we provide an analysis on the impact of digital technology on occupations, which is followed by our concluding remarks in section 9.

## Economic Diversification in Nevada

When investigating economic and occupational development in the state of Nevada, education and economic development professionals need to be aware of the economic diversity and how the lack of economic diversity impacts future economic and occupational development in the state of Nevada. A popular measure of economic diversity is the Hachman Index.[1] The Hachman

[1] The Hachman Index is calculated as the inverse of the weighted sum of the location quotients, by industry for each study area under analysis, across all industries. A location quotient (LQ) is the fraction of an area's employment in a particular industry divided by the fraction of the reference area's employment in the same industry. The LQs are weighted by the share of the area's employment in a particular industry. For example, counties with a large share of

Index was developed by Frank Hachman at the Bureau of Economic Research at the University of Utah. The Hachman index provides a measure of economic diversity using payroll and employment data (Tauer, 2022). The index measures how closely the employment distribution of the analysis region resembles that of the reference region, usually the U.S.

The closer the analysis region's employment mix matches the reference region's mix, the higher the value of the Hachman Index. The index has a maximum value of one – meaning the analysis area's employment mix is exactly the same as the reference region's mix of industry employment.

Table 1 shows the Hachman Index for all fifty states. It shows Nevada as one of the eleven states with a Hachman Index below 75.0. The other ten states include Hawaii (74.4), Oklahoma (70.3), Delaware (64.9), New Mexico (63.2), South Dakota (61.2), West Virginia (50.8), District of Columbia (49.6), Alaska (39.3), North Dakota (37.4), and Wyoming (33.9). States such as Oklahoma, New Mexico, South Dakota, West Virginia, Alaska and North Dakota have low economic diversity as they rely heavily on mining (particularly coal, oil and natural gas). Both Nevada and Hawaii have low diversity due to their reliance on leisure and hospitality sector.

Nevada also has the lowest Hachman index among states contiguous to Nevada. Those states include Arizona (95.9), California (93.2), Idaho (81.2), Oregon (92.9), and Utah (95.5). States with larger employment base tend to have more diverse economies due to a larger variety of economic opportunities and the presence of a wider range of economic sectors.[2]

employment in only a few key industries, which differ substantially from the share of employment for those industries nationwide, will have a relatively large weighted sum of LQs and subsequently a relatively low Hachman Index value (since it is the inverse of the weighted LQs). Conversely, counties which more closely reflect the statewide employment distribution will have relatively small weighted LQs and a relatively high Hachman Index value. The equation for the Hachman Index is shown in Taylor and Williams (2020).

[2] In a similar vein, Olesinski and Tosun (2021) examined Nevada's community resilience to external shocks during the COVID-19 pandemic. Using data from the U.S. Census Bureau's Community Resilience Estimates, they show that Nevada communities have lower resilience than all other Western states. They also show that Clark County has one of the highest share of high-risk communities in Nevada.

In this study, we are focusing on the economic diversity of Nevada, and specifically Clark County. Targeting occupations would be easier for a diverse economy, but an economy like the state of Nevada that is not diverse makes occupational targeting difficult.

**Table 1: Hachman Index Scores for States, 2022**

| State | Hachman Index | Rank | State | Hachman Index | Rank |
|---|---|---|---|---|---|
| Missouri | 97.4 | 1 | Massachusetts | 89.1 | 27 |
| Georgia | 97.1 | 2 | Minnesota | 89.1 | 28 |
| Illinois | 96.3 | 3 | Rhode Island | 89 | 29 |
| Arizona | 95.9 | 4 | Arkansas | 87.6 | 30 |
| Pennsylvania | 95.5 | 5 | Maryland | 87.6 | 31 |
| Utah | 95.5 | 6 | Mississippi | 87.3 | 32 |
| North Carolina | 95.1 | 7 | Texas | 86.3 | 33 |
| New Hampshire | 94.8 | 8 | Idaho | 81.2 | 34 |
| New Jersey | 94.5 | 9 | Indiana | 79.1 | 35 |
| Colorado | 94.2 | 10 | Iowa | 78.7 | 36 |
| California | 93.2 | 11 | Montana | 77.9 | 37 |
| Oregon | 92.9 | 12 | Washington | 77.7 | 38 |
| South Carolina | 92.7 | 13 | Nebraska | 77 | 39 |
| Tennessee | 92.4 | 14 | New York | 76.3 | 40 |
| Michigan | 92.1 | 15 | Hawaii | 74.4 | 41 |
| Ohio | 92.0 | 16 | **Nevada** | **73.8** | **42** |
| Wisconsin | 91.6 | 17 | Oklahoma | 70.3 | 43 |
| Kansas | 91.4 | 18 | Delaware | 64.9 | 44 |
| Maine | 91.4 | 19 | New Mexico | 63.2 | 45 |
| Alabama | 91.2 | 20 | South Dakota | 61.2 | 46 |
| Florida | 90.8 | 21 | West Virginia | 50.8 | 47 |
| Vermont | 90.7 | 22 | District of Columbia | 49.5 | 48 |
| Virginia | 90.6 | 23 | Alaska | 39.3 | 49 |
| Connecticut | 90.1 | 24 | North Dakota | 37.4 | 50 |
| Kentucky | 89.8 | 25 | Wyoming | 33.9 | 51 |
| Louisiana | 89.4 | 26 | | | |

Source: EMSI data presented by the Nevada Governor's Office of Economic Development (GOED).

## Data Sources

As one would expect, this is a data intensive study. The data for this study came from or through six sources: Nevada Department of Education (NDE), Nevada System of Higher Education (NSHE), Clark County School District (CCSD), College of Southern Nevada (CSN), Nevada Department of Employment, Training and Rehabilitation (DETR), and Proximity One (Table

1.2). The sources are treated as primary, although we are aware that some of the data they supplied came in-turn from others.[3]

**Table 2: Study Data by Source**

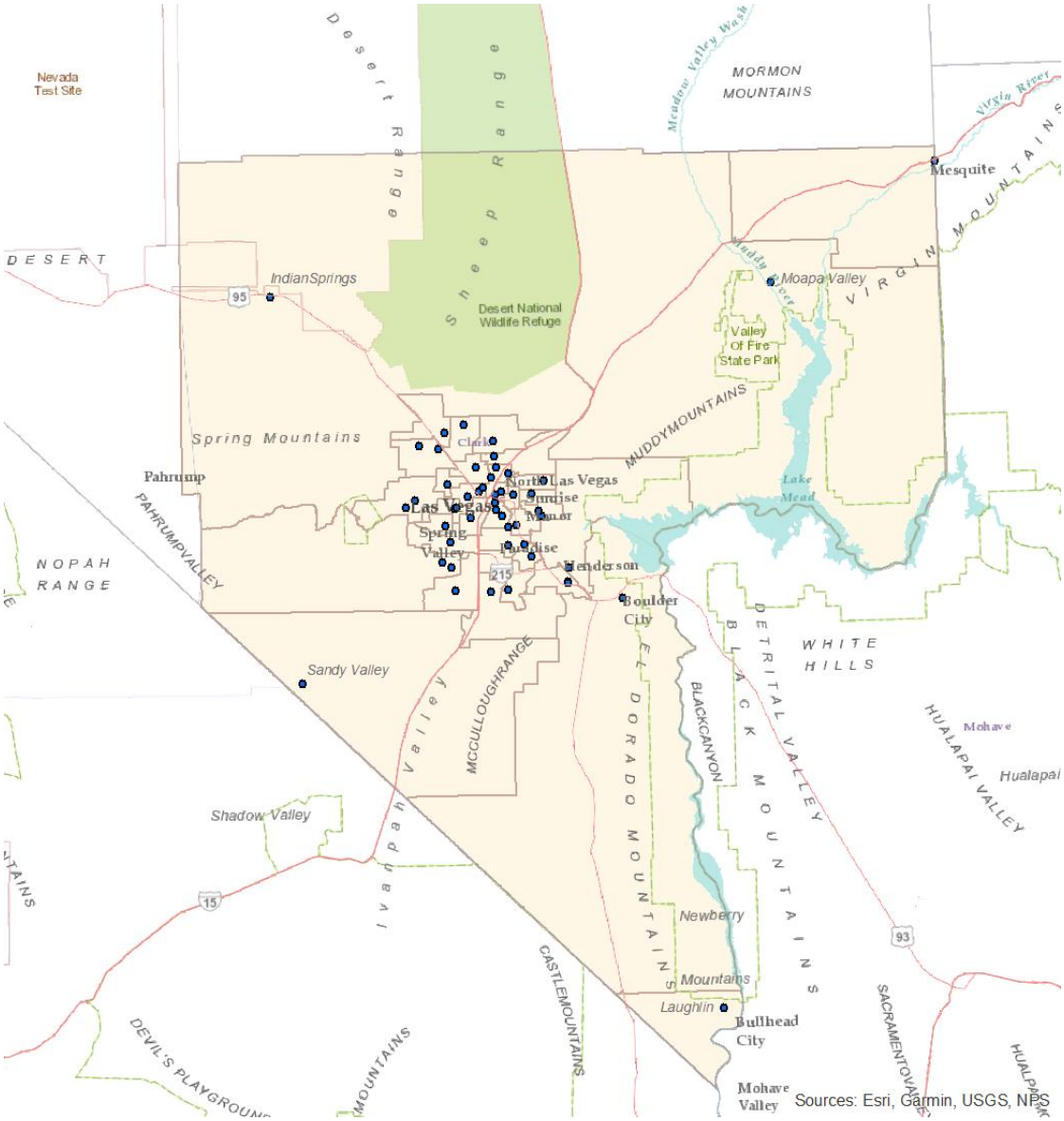
| Source | Data Supplied |
|---|---|
| NDE | Annual list of student achievement, attendance, and CTE enrollment by individual school. |
| NSHE | Annual dual enrollment data by school and enrollment/graduation numbers by degree. |
| CSN | Annual list of dual and concurrent enrollment by CCSD school and course. |
| CCSD | Annual list of (de-identified) students in attendance at each high school at end of year, together with measures of their academic performance that year, including GPA, ACT score, graduation status, diploma type, CTE programs completed.<br><br>Depiction of the geographic locations (longitude & latitude points) of high schools and their associated attendance zones (polygons) |
| DETR | Detailed workforce estimates (in 2020) and projections (to 2030) for Clark County in 6-digit SOC categories, together with anticipated workforce shrinkage (exits and out-transfers) from those categories over the decade |
| Proximity One | Census demographics (persons, in age/sex cohorts and race/ethnicity groups) and socio-economics (educational attainment, housing arrangements, household income, etc.) for Clark County at the block-group level |

[3] See Appendix 1 for more on data procedures used in the study.

## II. Southern Nevada Workforce Pipeline

Clark County, Nevada is coterminous with both the Las Vegas-Henderson-Paradise SMSA and the Clark County School District (CCSD), which simplifies data collection, analysis, and mapping in many ways. Figure 1 presents a site map of the study area.

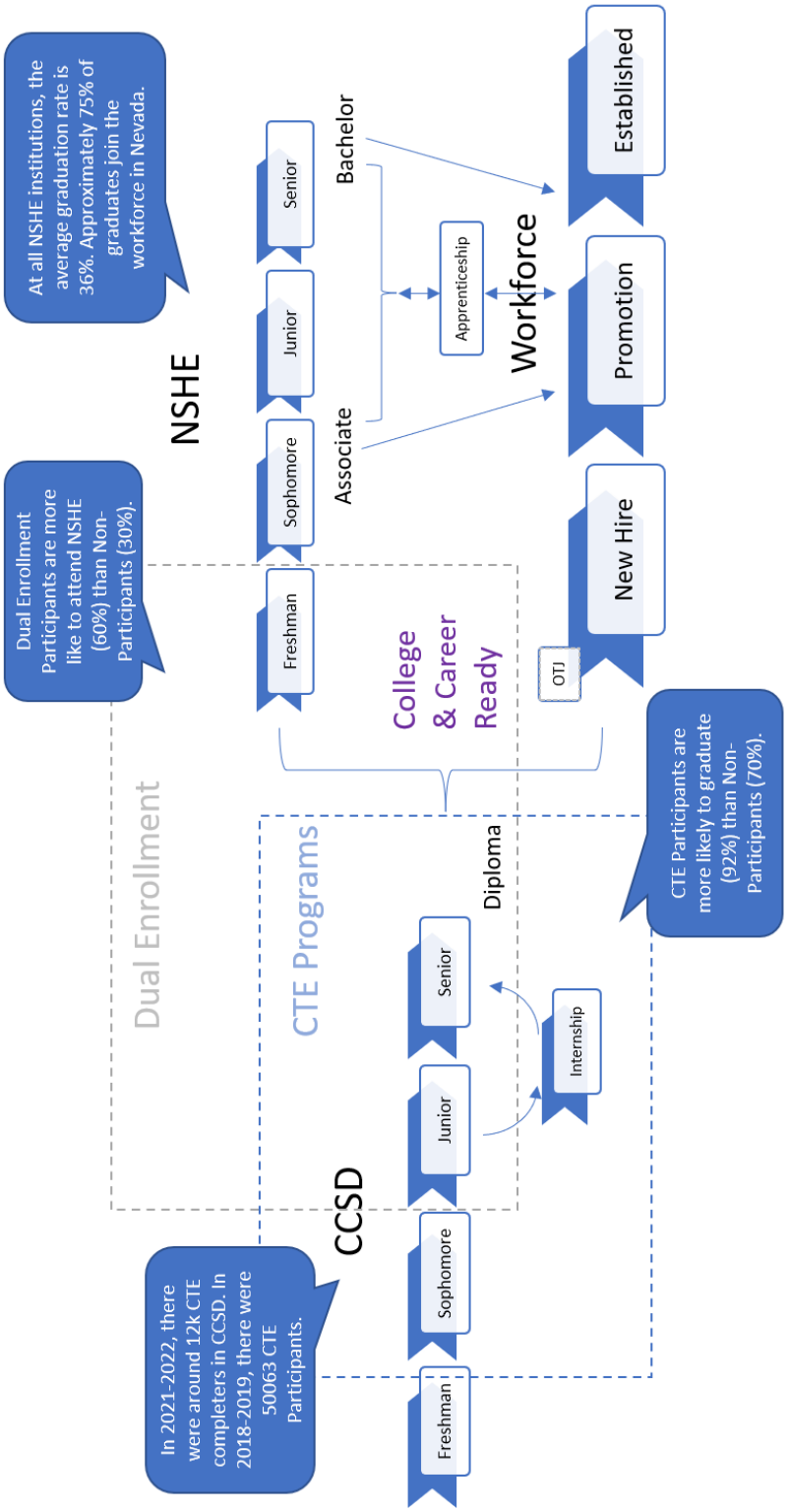
**Figure 1: Study area, showing CCSD attendance zones (brown outlines) and secondary schools (blue dots)**



This study focuses on the accomplishments and challenges of CCSD in readying its students for post-secondary education and/or the local workforce. Integral to the district's plan and progress are Career and Technical Education (CTE) programs in both its regular high schools and its specialized Career Technology Academies (CTA). Importantly, CTE programs also engage with the Nevada System of Higher Education (NSHE) community colleges and universities in so-called Dual Enrollment mechanisms, which provide students the opportunity to earn NSHE credits concurrently with CCSD credits in their junior and senior years. Thus, the education process extends continuously from Kindergarten through high school to two- and four-year colleges, increasingly referred to as K-16. Figure 2 sketches this overall educational and workforce "pipeline".

In the K-16 education to workforce pipeline, students start with CTE program enrollment in their freshman year in high school. In their sophomore year, students enroll in the second level of their CTE program. Students do additional CTE coursework or take dual credit courses in their junior and senior years. Students also take their ACT in their junior year. Note that CTE participants are more likely to graduate, with graduation rate of 92.1%, than non-CTE participants with 69.8% graduation rate. After graduating from high school, students can enter the workforce or continue with post-secondary education. 60% of those students who have completed dual credit courses continue with NSHE institutions, whereas only 30% of those without dual credit courses continue their education with NSHE institutions. While graduation rates in NSHE institutions vary widely from 16% to 62%, 75% of those students that graduate with a Bachelor's degree enter the workforce in Nevada. We should also note that in many occupations, continuing education is needed for upskilling or reskilling.

**Figure 2: Nevada Workforce Pipeline**



## III. Southern Nevada Occupation Forecasts

This section of the Phase II report examines current and future trends in employment and occupation for Southern Nevada. The national and state trends sections of the report rely substantially on data provided by the United States Bureau of Labor Statistics (Kevin S. Dubina, Lindsey Ice, Hanie-Lynn Kim, and Michael J. Rieley, "Projections Overview and Highlights, 2020-30") and the Nevada Department of Employment, Training, and Rehabilitation (DETR, 2022). Insights from this section of the report can help inform economic development and occupational training policy decision makers as well as help to identify potential business, industrial, employment, and occupational opportunities in the Southern Nevada.

### Southern Nevada Occupational Trends

Occupational forecasts for Southern Nevada were provided from the State of Nevada Department of Employment, Training, and Rehabilitation (2022). Tables 3, 4, and 5 examine trends in Southern Nevada occupations including the largest percentage increases, largest numeric job increases, and largest job decreases in occupations. Many of these values reflect current trends while others reflect longer-term macroeconomic transformations. Each section below provides a brief survey of each of the following tables.

Table 3.1 shows the top twenty Southern Nevada occupations with the largest percentage increase in jobs from 2020 to 2030 in addition to their average annual openings (as of 2020). These trends reflect longer term structural changes to the Nevada and Southern Nevada workforce, such as a transition to include more technology related roles in addition to the growing demand of the healthcare industry due to an aging population.

- Jobs in mathematical, science, and health related occupations are also set to increase substantially over the next decade but are lower ranked due to low base year values for many occupations related to leisure and hospitality.
- Healthcare services, occupational therapy aides and physical therapist assistants and aides are predicted to increase by 46%.

**Table 3: Top Southern Nevada Occupations for 2030**

| SOC Code | SOC Title | 2020 | 2030 | Change | Change (%) 2020-2030 | Annualized Percentage Growth | Avg. Annual Openings |
|---|---|---|---|---|---|---|---|
| 393 | Entertainment Attendants and Related Workers | 20,584 | 31,398 | 10,814 | **52.54%** | 4.31% | 5,293 |
| 392 | Animal Care and Service Workers | 1,219 | 1,845 | 626 | **51.35%** | 4.23% | 287 |
| 312 | Occupational Therapy and Physical Therapist Assistants and Aides | 863 | 1,304 | 441 | **51.10%** | 4.21% | 174 |
| 391 | Supervisors of Personal Care and Service Workers | 4,908 | 7,298 | 2,390 | **48.70%** | 4.05% | 885 |
| 272 | Entertainers and Performers, Sports and Related Workers | 3,795 | 5,590 | 1,795 | **47.30%** | 3.95% | 717 |
| 396 | Baggage Porters, Bellhops, and Concierges | 2,214 | 3,162 | 948 | **42.82%** | 3.63% | 441 |
| 359 | Other Food Preparation and Serving Related Workers | 19,120 | 26,725 | 7,605 | **39.78%** | 3.41% | 4,898 |
| 152 | Mathematical Science Occupations | 440 | 609 | 169 | **38.41%** | 3.30% | 53 |
| 352 | Cooks and Food Preparation Workers | 29,251 | 40,319 | 11,068 | **37.84%** | 3.26% | 6,314 |
| 351 | Supervisors of Food Preparation and Serving Workers | 8,632 | 11,863 | 3,231 | **37.43%** | 3.23% | 1,783 |
| 274 | Media and Communication Equipment Workers | 3,854 | 5,233 | 1,379 | **35.78%** | 3.11% | 569 |
| 395 | Personal Appearance Workers | 5,189 | 7,011 | 1,822 | **35.11%** | 3.06% | 825 |
| 537 | Material Moving Workers | 49,554 | 65,596 | 16,042 | **32.37%** | 2.84% | 9,492 |
| 353 | Food and Beverage Serving Workers | 57,290 | 75,659 | 18,369 | **32.06%** | 2.82% | 14,681 |
| 399 | Other Personal Care and Service Workers | 10,281 | 13,472 | 3,191 | **31.04%** | 2.74% | 2,024 |

| SOC Code | SOC Title | 2020 | 2030 | Change | Change (%) 2020-2030 | Annualized Percentage Growth | Avg. Annual Openings |
|---|---|---|---|---|---|---|---|
| 536 | Other Transportation Workers | 3,679 | 4,743 | 1,064 | **28.92%** | 2.57% | 710 |
| 372 | Building Cleaning and Pest Control Workers | 36,823 | 47,372 | 10,549 | **28.65%** | 2.55% | 6,628 |
| 516 | Textile, Apparel, and Furnishings Workers | 3,678 | 4,728 | 1,050 | **28.55%** | 2.54% | 619 |
| 113 | Operations Specialties Managers | 8,792 | 11,269 | 2,477 | **28.17%** | 2.51% | 987 |
| 253 | Other Teachers and Instructors | 6,728 | 8,602 | 1,874 | **27.85%** | 2.49% | 1,055 |

Table 3 shows that employment for Southern Nevada is forecasted to increase from 960,895 in 2020 to 1,183,513 by 2030. Employment in Southern Nevada is forecasted to grow by a little over 23%, far outpacing the national average of 5.3 %. Table 4 also shows that the occupations with some of the largest forecasted numeric growths are Food and Beverage Serving Workers and Material Moving Workers occupations. Food Preparation and Services related occupations are projected to experience the largest increase of 18,369 jobs over the decade between 2020 and 2030, which is also similar to the broader occupational trends in the state of Nevada.

Table 5 shows the top twenty Southern Nevada occupations with the smallest numeric increase between 2020 and 2030 in addition to their average annual openings (as of 2020). Only two occupations are forecasted to decline which shows the dynamic growth forecasted for Southern Nevada.

- Religious workers and communication equipment operators are forecasted for declining employment from 2020 to 2030.
- Extraction occupations are forecasted to have low growth. Southern Nevada does not have mineral deposits of gold and lithium whereas the Balance of State should see increases in this occupation.

**Table 4: Top Twenty Southern Nevada Occupations with Largest Numerical Increase**

| SOC Code | SOC Title | 2020 | 2030 | Change | Change (%) 2020-2030 | Annualized Percentage Growth | Avg. Annual Openings |
|---|---|---|---|---|---|---|---|
| 353 | Food and Beverage Serving Workers | 57,290 | 75,659 | 18,369 | **32.06%** | 2.82% | 14,681 |
| 537 | Material Moving Workers | 49,554 | 65,596 | 16,042 | **32.37%** | 2.84% | 9,492 |
| 472 | Construction Trades Workers | 52,356 | 64,941 | 12,585 | **24.04%** | 2.18% | 6,777 |
| 352 | Cooks and Food Preparation Workers | 29,251 | 40,319 | 11,068 | **37.84%** | 3.26% | 6,314 |
| 393 | Entertainment Attendants and Related Workers | 20,584 | 31,398 | 10,814 | **52.54%** | 4.31% | 5,293 |
| 372 | Building Cleaning and Pest Control Workers | 36,823 | 47,372 | 10,549 | **28.65%** | 2.55% | 6,628 |
| 412 | Retail Sales Workers | 62,090 | 71,543 | 9,453 | **15.22%** | 1.43% | 11,257 |
| 359 | Other Food Preparation and Serving Related Workers | 19,120 | 26,725 | 7,605 | **39.78%** | 3.41% | 4,898 |
| 291 | Healthcare Diagnosing or Treating Practitioners | 34,321 | 41,040 | 6,719 | **19.58%** | 1.80% | 2,444 |
| 119 | Other Management Occupations | 27,391 | 33,621 | 6,230 | **22.74%** | 2.07% | 3,035 |
| 499 | Other Installation, Maintenance, and Repair Occupations | 19,207 | 24,366 | 5,159 | **26.86%** | 2.41% | 2,617 |
| 434 | Information and Record Clerks | 44,330 | 49,342 | 5,012 | **11.31%** | 1.08% | 6,255 |
| 339 | Other Protective Service Workers | 21,949 | 26,747 | 4,798 | **21.86%** | 2.00% | 3,951 |
| 131 | Business Operations Specialists | 29,860 | 34,511 | 4,651 | **15.58%** | 1.46% | 3,221 |
| 292 | Health Technologists and Technicians | 16,255 | 20,143 | 3,888 | **23.92%** | 2.17% | 1,663 |
| 252 | Preschool, Elementary, Middle, Secondary, and Special Education Teachers | 18,970 | 22,813 | 3,843 | **20.26%** | 1.86% | 1,915 |

| SOC Code | SOC Title | 2020 | 2030 | Change | Change (%) 2020-2030 | Annualized Percentage Growth | Avg. Annual Openings |
|---|---|---|---|---|---|---|---|
| 111 | Top Executives | 15,576 | 18,840 | 3,264 | **20.96%** | 1.92% | 1,721 |
| 351 | Supervisors of Food Preparation and Serving Workers | 8,632 | 11,863 | 3,231 | **37.43%** | 3.23% | 1,783 |
| 533 | Motor Vehicle Operators | 22,537 | 25,738 | 3,201 | **14.20%** | 1.34% | 3,040 |
| 399 | Other Personal Care and Service Workers | 10,281 | 13,472 | 3,191 | **31.04%** | 2.74% | 2,024 |

**Table 5: Top Twenty Southern Nevada Occupations with Smallest Numerical Increase**

| SOC Code | SOC Title | 2020 | 2030 | Change | Change (%) 2020-2030 | Annualized Percentage Growth | Avg. Annual Openings |
|---|---|---|---|---|---|---|---|
| 212 | Religious Workers | 214 | 206 | (8) | **-3.74%** | -0.38% | 21 |
| 432 | Communications Equipment Operators | 1,192 | 1,187 | (5) | **-0.42%** | -0.04% | 128 |
| 518 | Plant and System Operators | 670 | 688 | 18 | **2.69%** | 0.27% | 66 |
| 475 | Extraction Workers | 210 | 248 | 38 | **18.10%** | 1.68% | 31 |
| 191 | Life Scientists | 395 | 439 | 44 | **11.14%** | 1.06% | 36 |
| 394 | Funeral Service Workers | 234 | 284 | 50 | **21.37%** | 1.96% | 36 |
| 192 | Physical Scientists | 601 | 667 | 66 | **10.98%** | 1.05% | 65 |
| 193 | Social Scientists and Related Workers | 922 | 999 | 77 | **8.35%** | 0.81% | 81 |
| 171 | Architects, Surveyors, and Cartographers | 715 | 818 | 103 | **14.41%** | 1.35% | 70 |
| 254 | Librarians, Curators, and Archivists | 987 | 1,096 | 109 | **11.04%** | 1.05% | 140 |
| 397 | Tour and Travel Guides | 629 | 746 | 117 | **18.60%** | 1.72% | 120 |
| 436 | Secretaries and Administrative Assistants | 15,750 | 15,898 | 148 | **0.94%** | 0.09% | 1,704 |
| 517 | Woodworkers | 851 | 1,002 | 151 | **17.74%** | 1.65% | 107 |
| 332 | Firefighting and Prevention Workers | 1,072 | 1,231 | 159 | **14.83%** | 1.39% | 104 |
| 299 | Other Healthcare Practitioners and Technical Occupations | 693 | 856 | 163 | **23.52%** | 2.13% | 70 |
| 152 | Mathematical Science Occupations | 440 | 609 | 169 | **38.41%** | 3.30% | 53 |
| 452 | Agricultural Workers | 1,720 | 1,920 | 200 | **11.63%** | 1.11% | 305 |
| 195 | Occupational Health and Safety Specialists and Technicians | 1,001 | 1,203 | 202 | **20.18%** | 1.86% | 97 |
| 194 | Life, Physical, and Social Science Technicians | 1,462 | 1,669 | 207 | **14.16%** | 1.33% | 208 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 473 | Helpers, Construction Trades | 1,439 | 1,771 | 332 | **23.07%** | 2.10% | 220 |

## Southern Nevada Occupations by Average Annual Wage

Table 6 shows the top twenty occupations for Southern Nevada by average annual wage. Probably not surprising, five of the top twenty occupations with the highest annual wage are in the medical field. However, these top twenty occupations make up only 4.27% of total Southern Nevada employment.

**Table 6: Top Twenty Occupations for Southern Nevada by Average Annual Wage, 2020.**

| Occupation | Average Annual Wage | Employment |
|---|---|---|
| Chief Executives | $239,870 | 605 |
| Airline Pilots, Copilots, and Flight Engineers | $238,320 | 1,640 |
| Dentists, General | $188,590 | 656 |
| Judges, Magistrate Judges, and Magistrates | $159,900 | 113 |
| Marketing Managers | $143,900 | 1,554 |
| Computer and Information Systems Managers | $136,690 | 1,566 |
| Lawyers | $133,940 | 3,576 |
| General and Operations Managers | $127,450 | 14,230 |
| Air Traffic Controllers | $126,380 | 197 |
| Physician Assistants | $125,930 | 447 |
| Pharmacists | $122,800 | 1,827 |
| Compensation and Benefits Managers | $122,300 | 103 |
| Financial Managers | $120,300 | 4,369 |
| Human Resources Managers | $119,930 | 724 |
| Chemical Engineers | $119,830 | 36 |
| Medical and Health Services Managers | $117,940 | 1,956 |
| Education Administrators, Postsecondary | $115,250 | 402 |
| Natural Sciences Managers | $115,190 | 122 |
| Advertising and Promotions Managers | $115,050 | 196 |
| Physical Therapists | $113,950 | 1,129 |

Table 7 shows the top twenty occupations by lowest average annual wage. Most of the occupations in the lowest paid occupations are in the Accommodation and Food Service Sectors. Of interest, childcare workers have the fourth lowest average annual wage. This is an issue that may need to be addressed for increased participation of the female workforce. These are the

twenty lowest occupations by wage; however, their proportionate share of total Southern Nevada employment is 15.53%.

**Table 7: Lowest Twenty of Southern Nevada Occupations by Average Annual Wage, 2020**

| Occupation | Average Annual Wage | Employment |
|---|---|---|
| Gaming Dealers | $18,790 | 19,585 |
| Hairdressers, Hairstylists, and Cosmetologists | $21,520 | 2,400 |
| Cooks, Fast Food | $22,130 | 9,396 |
| Childcare Workers | $22,170 | 2,697 |
| Lifeguards, Ski Patrol, and Other Recreational Pro | $22,200 | 1,600 |
| Ushers, Lobby Attendants, and Ticket Takers | $22,930 | 2,978 |
| Amusement and Recreation Attendants | $23,730 | 3,596 |
| Packers and Packagers, Hand | $23,780 | 3,082 |
| Nonfarm Animal Caretakers | $24,140 | 1,063 |
| Dining Room and Cafeteria Attendants and Bartender | $24,280 | 12,968 |
| Cashiers | $24,280 | 26,828 |
| Waiters and Waitresses | $24,330 | 30,084 |
| Recreation Workers | $24,390 | 2,701 |
| Cleaners of Vehicles and Equipment | $24,590 | 3,386 |
| Manicurists and Pedicurists | $24,710 | 319 |
| Pressers, Textile, Garment, and Related Materials | $24,720 | 507 |
| Laundry and Dry-Cleaning Workers | $25,280 | 3,528 |
| Automotive and Watercraft Service Attendants | $25,330 | 899 |
| Textile Cutting Machine Setters, Operators | $25,850 | 48 |
| Gaming and Sports Book Writers and Runners | $26,080 | 1,134 |

## Most Salient Points of Southern Nevada Occupation Forecasts

- Employment in Southern Nevada is forecasted to increase from 960,895 in 2020 to 1,183,513 by 2030.
- Employment in Southern Nevada is forecasted to grow by a little over 23%, far outpacing the national average of 5.3%.
- Southern Nevada is forecast to have an annualized employment growth rate of 2.07% between 2020 and 2030.
- Some of the occupations forecasted for the fastest percentage growth are the Entertainment Attendants and Related Workers (52.54%) and Animal Care and Service

Workers (52.35%). Given the aging of the Southern Nevada population, the Occupational Therapy and Physical Therapist Assistants and Aides occupation is forecasted to grow by 51.10%.

- The two Southern Nevada occupations forecasted to have the largest numeric increases from 2020 to 2030 are the Food and Beverage Serving Workers occupation with increase of 18,369 and the Material Moving Workers occupations with an increase of 16,042.
- Similar to national trends, Southern Nevada is forecasted to have one of the smallest increases in occupations for Office and Administrative Support Occupations with 148 employees over ten years. Only two occupations are forecasted for negative growth from 2020 to 2030, these occupations are: (1) religious workers are decreasing by 8 employees; and (2) communication equipment operators are decreasing by five employees.
- Five occupations that make up the top twenty of occupations by highest average annual wage are in the health sector. These top twenty occupations make up only 4.27% of total Southern Nevada employment.
- Most occupations that make up the lowest twenty by average annual salary are in the accommodations and food service sector. These twenty low average annual salaries makeup 15.53 % of total Southern Nevada employment.

## IV. Targeted Occupation Analysis for Southern Nevada

Southern Nevada economy has recently realized extreme business cycles with the 2018 financial crisis and in 2020 with the COVID-19 pandemic closures of many businesses, especially in the casino industry. Southern Nevada has rebounded from these economic cycles and administrative closures while recognizing that there exists an evolving workforce need across industries and economic sectors. In 2021 the Las Vegas Global Economic Alliance (LVGEA) adopted a new Comprehensive Economic Development Strategy (CEDS) which outlined a five-year plan.

With new economic sectors identified, LVGEA and its partners commissioned a third Workforce Blueprint working with the State of Nevada Governor's Office on Economic Development and Southern Nevada partners. The LVGEA Workforce Blueprint (2022) identified 100 occupations to be targeted in order to meet the labor force needs of the targeted industries.

### Why Occupational Targeting?

For many traditional economic development researchers and practitioners, regional economic analysis has meant examining only industrial strengths and weaknesses and developing strategies to replace declining industries and enhance county economic competitiveness. In short, industrial sector analysis has dominated any approaches to economic development.

With the research of Thompson and Thompson (1985), the trend for economic development is changing. Researchers and economic development practitioners have begun to pay attention to occupations as well as industries. Recently, regional competitiveness has become increasingly dependent upon local knowledge bases and worker quality. Economic development activities that target occupations provide a different angle in formulating development targets. For example, although the mining and casino industries produce completely different products, software engineers in the two sectors often perform similar and interchangeable tasks. Because workers who perform similar tasks can easily move between industries with minimal training, strategies that target sole industries may overlook occupation-based opportunities across industries. For this reason, economic development practitioners need to pay attention to the functions that local workers perform as to the output they produce (Feser, 2003).

For successful occupational targeting, education leaders, state and local lawmakers, and economic development practitioners need to be aware of the concentration of current occupations and those projected in the future. The degree of concentration in the Southern Nevada economy is determined by calculating location quotients (LQ) for individual occupations. Location quotients indicate the economic importance of each regional occupation relative to the same occupation at the national level. The primary focus of location quotients is to identify the occupations that are either more important or less important locally, than nationally. The more occupations in a study area that have higher location quotients, the more diverse is the study area's economy. On the other hand, extremely low location quotients represent occupations that are underdeveloped and may offer an opportunity for future development.

## Occupational Location Quotients of the 100 Targeted Occupations

Projections for occupations in the Las Vegas-Henderson-Paradise (Clark County) SMSA were obtained from the State of Nevada Department of Employment. Training, and Rehabilitation (2022). Occupational projections are driven by occupation growth, labor force exits, occupational transfers, and occupational openings.[4] For this study, the number of years in between the base year (2020) and the forecasted year (2030) is ten. Using procedures outlined by Michael Porter (2000) for economic clustering and targeting, results of the location quotient calculations are divided into four tables. Table 4.1 shows results of occupations that are classified as STAR. STAR occupations are those occupations with 2030 location quotient value greater than one and whose change in location quotient value from 2020 to 2030 is positive. STAR occupations are specialized compared to the nation and from 2020 to 2030 and their specialization is forecasted to increase. Table 4.2 shows results of occupations that are classified as Mature. Mature occupations are those whose occupations with 2030 location quotient values

[4] First, occupation growth is the difference between the employment in a given occupation in the Forecast Year (2030) to the Base Year (2020). Second, labor force exits occur when a worker leaves an occupation, creating a vacancy for another worker to fill. Third, occupational transfers are when an employee takes a job in another occupation which creates an occupation projection. Fourth, occupational openings or annual openings are the sum of occupational growth, exits, and transfers. The average annual openings are the total openings divided by the number of years in forecast.

greater than one but are decreasing in value from 2020 to 2030. Mature occupations are still specialized compared to the nation but for the forecasted next ten years their specialization within Southern Nevada is forecasted to decrease. Table 4.3 shows results of the occupations that are classified as Emerging. Emerging occupations are those whose 2030 location quotient value is less than one but their location quotient value from 2020 to 2030 is increasing. Emerging occupations are less specialized in 2020 compared to the nation, however, during the forecasted ten years their specialization is increasing. Some of the Southern Nevada occupations that are Emerging may become more specialized in the future. Table 4.4 shows results of the occupations that are classified as Transforming. Transforming occupations are those Southern Nevada 2030 occupations with location quotient values less than one and whose location quotient value over the forecasted ten years will be decreasing. These Southern Nevada occupations are less specialized, and their specialization is declining. The Transforming occupations are unlikely to become specialized in the future and may need workforce training for changing occupational skills of workers in these occupations.

The format heading of these four tables shows the occupation type, location quotient value in 2020, location quotient value in 2030, average annual salary for 2020, forecasted annual openings, typical entry level education for each occupation, work experience in related occupation, and type of on-the-job training for each occupation. Table 8 shows the results of the location quotient analysis for Star occupations of the 100 occupations targeted by LVGEA in Southern Nevada. The occupation with the highest location quotient is Commercial Pilots with a location quotient of 2.43. This means the proportionate share of employment in Southern Nevada for Commercial Pilots is 2.43 times of the national proportionate share. From Table 8, Elementary School Teachers, Except Special Education and Middle School Teachers, Except Special and Career/Technical Education occupations are Star occupations and are linked to the new economy. All occupations in the Star category require a High School Diploma or Equivalent or higher for typical entry level education. Forecasted annual openings in the Star occupation category are estimated to make up 32.09% of total study area annual openings. As mentioned earlier, this analysis is restricted to the 100 occupations targeted by LVGEA, however, using all occupations in Southern Nevada, the occupation with the largest location

quotient is the Gaming Dealer occupation with a location quotient of 30.32. Nine of the top location quotient sectors in the Star category are in the gaming sector. This shows the impact of the gaming industry and will remain a major role in the area's economic development goals.

**Table 8: Star Occupations of the 100 Targeted Occupations by LVGEA in Southern Nevada 2020-2030**

| Occupation | LQ 2020 | LQ 2030 | Average Annual Salary | Annual Openings | Typical Entry-Level Education | Work Experience in a Related Occupation | Typical on-the-job Training |
|---|---|---|---|---|---|---|---|
| Civil Engineers | 1.08 | 1.09 | $ 85,850 | 170 | Bachelor's Degree | None | None |
| Respiratory Therapists | 1.81 | 1.93 | $ 75,670 | 113 | Associate's Degree | None | None |
| Computer-User Support Specialists | 1.13 | 1.16 | $ 50,200 | 405 | Some college, no degree | None | Moderate-term |
| Environmental Science and Protection Technicians, Including Health | 2.00 | 2.07 | $ 41,970 | 56 | Associate's Degree | None | None |
| Construction Manager | 1.79 | 1.93 | $ 87,430 | 486 | Bachelor's Degree | None | Moderate-term |
| Computer Network Support Services | 1.20 | 1.45 | $ 62,430 | 152 | Associate's Degree | None | Moderate-term |
| Occupational Therapists | 1.04 | 1.04 | $ 105,440 | 64 | Master's Degree | None | None |
| Electrical and Electronic Engineering Technologists and Technicians | 1.67 | 1.70 | $ 69,530 | 99 | Associate's Degree | None | None |
| Elementary School Teachers, Except Special Education | 1.09 | 1.10 | $ 55,080 | 713 | Bachelor's Degree | None | None |
| Sales Manager | 1.04 | 1.06 | $ 112,930 | 276 | Bachelor's Degree | Less than 5 years | None |
| Electricians | 1.58 | 1.69 | $ 63,610 | 823 | High School diploma or equivalent | None | Apprenticeship |

| Occupation | LQ 2020 | LQ 2030 | Average Annual Salary | Annual Openings | Typical Entry-Level Education | Work Experience in a Related Occupation | Typical on-the-job Training |
|---|---|---|---|---|---|---|---|
| Middle School Teachers, Except Special and Career/Technical Education | 1.03 | 1.04 | $ 59,380 | 300 | Bachelor's Degree | None | None |
| First-Line Supervisors of Mechanics, Installers, and Repairers | 0.99 | 1.03 | $ 71,820 | 323 | High School diploma or equivalent | Less than 5 years | None |
| Plumbers, Pipefitters, and Steamfitters | 1.52 | 1.63 | $ 55,430 | 486 | High School diploma or equivalent | None | Apprenticeship |
| Commercial Pilots | 2.20 | 2.43 | $ 102,620 | 81 | Postsecondary non-degree award | None | Moderate-term |
| First-Line Supervisors of Construction Trades and Extraction Workers | 1.31 | 1.38 | $ 67,560 | 615 | High School diploma or equivalent | 5 years or more | None |
| Environmental Engineering Technologists and Technicians | 1.00 | 1.01 | $ 50,530 | 9 | Associate's Degree | None | None |
| Installation, Maintenance, and Repair Workers, All Other | 1.54 | 1.54 | $ 48,740 | 188 | High School diploma or equivalent | None | Moderate-term |
| Cost Estimators | 1.31 | 1.41 | $ 63,200 | 160 | Bachelor's Degree | None | Moderate-term |

Table 9 shows the location quotient results of the 100 targeted occupations by the LVGEA in Southern Nevada that are classified as Mature. The highest location quotient in Mature occupations is the Airline Pilots, Copilots, and Flight Engineers Occupation with a location quotient of 3.10 forecasted in 2030. This means this occupation in Southern Nevada has a local proportionate share that is 3.10 times the nation. However, the location quotient is forecasted to decline from 3.30 in 2020 to 3.10 in 2030. The Mature occupations are a combination of manufacturing, airline transportation, and medical sector occupations. For the Mature occupations, all 15 occupations have typical entry-level education at High School diploma or equivalent and above. Forecasted annual openings in the Mature occupation category are estimated to make up 18.08% of total study area annual openings.

Table 10 shows the location quotient results of occupations in Southern Nevada that are classified as Emerging. The highest location quotient in the Emerging occupations was the Transportation, Storage, and Distribution Managers occupation with a location quotient value of 0.98. The study area's location quotient is slightly lower than the nation's proportionate share but the location quotient value increased from 2020 to 2030. The Emerging occupations cover occupations in manufacturing, logistics, business, medical, and data analytics. Additionally, the Secondary School Teachers, Except Special and Career/Technical Education occupation are classified as an Emerging occupation. This occupation will be an important factor as the Las Vegas-Henderson-Paradise SMSA targets the new economy. Of the fifteen Emerging occupations, all Emerging occupations require an entry education level of a High School level or equivalent or above. Forecasted annual openings in the Emerging occupation category are estimated to take up 11.54% of total annual openings.

Table 11 shows the location quotient results of occupations in Southern Nevada that are classified as Transforming. The highest location quotient in the Transforming occupations was the Lawyers occupation with a location quotient value in 2030 of 0.98. For the twenty-nine Transforming occupations, all Transforming occupations in Southern Nevada require entry education of a high school education or equivalent and above. With the new economy, many of the occupations in the Transforming occupations may disappear or skills required may rapidly changes. These workers would be candidates for change inoccupation education in the future.

**Table 9: Mature Occupations of the 100 Targeted Occupations by LVGEA in Southern Nevada, 2020-2030**

| Occupation | LQ 2020 | LQ 2030 | Average Annual Salary | Annual Openings | Typical Entry-Level Education | Work Experience in a Related Occupation | Typical on-the-job Training |
|---|---|---|---|---|---|---|---|
| Airline, Copilots, and Flight Engineering | 3.30 | 3.10 | $ 317,441 | 183 | Bachelor's Degree | Less than 5 years | Moderate-term |
| Veterinary Assistants, and Laboratory Animal Caretakers | 2.27 | 2.16 | $ 27,880 | 245 | High School diploma or equivalent | None | Short-term |
| Health and Safety Engineers, Except Mining Safety Engineers and Inspectors | 1.93 | 1.89 | $ 81,190 | 19 | Bachelor's Degree | None | None |
| Surgical Technologists | 1.63 | 1.56 | $ 62,890 | 81 | Postsecondary nondegree award | None | None |
| Aircraft Mechanics and Service Technicians | 1.57 | 1.55 | $ 84,020 | 110 | Postsecondary nondegree award | None | None |
| Architectural and Civil Drafters | 1.45 | 1.45 | $ 53,000 | 85 | Associate's Degree | None | None |
| Civil Engineering Technicians | 1.44 | 1.42 | $ 53,570 | 52 | Associate's Degree | None | None |
| Pharmacists | 1.29 | 1.26 | $ 128,950 | 111 | Doctoral or professional degree | None | None |
| Construction and Building Inspectors | 1.16 | 1.15 | $ 77,790 | 94 | High School diploma or equivalent | 5 years or more | Moderate-term |

| Occupation | LQ 2020 | LQ 2030 | Average Annual Salary | Annual Openings | Typical Entry-Level Education | Work Experience in a Related Occupation | Typical on-the-job Training |
|---|---|---|---|---|---|---|---|
| Registered Nurses | 1.16 | 1.13 | $ 87,960 | 1340 | Bachelor's Degree | None | None |
| Surveyors | 1.11 | 1.11 | $ 83,600 | 28 | Bachelor's Degree | None | Internship/ Residency |
| Environmental Engineers | 1.09 | 1.05 | $ 91,730 | 21 | Bachelor's Degree | None | None |
| Physical Therapists | 1.07 | 1.06 | $ 99,670 | 99 | Doctoral or professional degree | None | None |
| Training and Development Specialists | 1.07 | 1.04 | $ 54,600 | 225 | Bachelor's Degree | Less than 5 years | None |
| Financial Managers | 1.02 | 1.01 | $ 103,930 | 416 | Bachelor's Degree | 5 years or more | None |

**Table 10: Emerging Occupations of the 100 Targeted Occupations by LVGEA in Southern Nevada, 2020-2030**

| Occupation | LQ 2020 | LQ 2030 | Average Annual Salary | Annual Openings | Typical Entry-Level Education | Work Experience in a Related Occupation | Typical on-the-job Training |
|---|---|---|---|---|---|---|---|
| Electrical Engineers | 0.42 | 0.43 | $ 85,940 | 34 | Bachelor's Degree | None | None |
| Logisticians | 0.36 | 0.37 | $ 61,760 | 55 | Bachelor's Degree | None | None |
| Transportation, Storage, and Distribution Managers | 0.91 | 0.98 | $ 82,720 | 82 | High School diploma or equivalent | 5 years or more | None |
| Mechanical Engineers | 0.38 | 0.38 | $ 90,390 | 44 | Bachelor's Degree | None | None |
| Marketing Research Analysts and Marketing Specialists | 0.66 | 0.67 | $ 55,680 | 394 | Bachelor's Degree | None | None |
| Computer Network Architects | 0.49 | 0.49 | $ 98,000 | 35 | Bachelor's Degree | 5 years or more | None |
| Speech-Language Pathologists | 0.87 | 0.88 | $ 80,010 | 76 | Master's Degree | None | Internship/ Residency |
| Network and Computer Systems Administrators | 0.62 | 0.62 | $ 83,300 | 90 | Bachelor's Degree | None | None |
| Secondary School Teachers, Except Special and Career/Technical Education | 0.87 | 0.87 | $ 57,090 | 425 | Bachelor's Degree | None | None |
| Marketing Managers | 0.81 | 0.82 | $ 106,080 | 154 | Bachelor's Degree | 5 years or more | None |
| Licensed Practical and Licensed Vocational Nurses | 0.63 | 0.78 | $ 59,710 | 295 | Postsecondary nondegree award | None | None |
| Purchasing Managers | 0.76 | 0.82 | $ 111,390 | 31 | Bachelor's Degree | 5 years or more | None |
| Physical Therapist Assistants | 0.70 | 0.77 | $ 61,400 | 71 | Associate's Degree | None | None |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Human Resources Managers | 0.73 | 0.75 | $ 103,330 | 71 | Bachelor's Degree | 5 years or more | None |
| Graphic Designers | 0.84 | 0.85 | $ 50,940 | 128 | Bachelor's Degree | None | None |

**Table 11: Transforming Occupations of the 100 Targeted Occupations by LVGEA in Southern Nevada, 2020-2030**

| Occupation | LQ 2020 | LQ 2030 | Average Annual Salary | Annual Openings | Typical Entry-Level Education | Work Experience in a Related Occupation | Typical on-the-job Training |
|---|---|---|---|---|---|---|---|
| Veterinarians | 0.91 | 0.87 | $ 97,130.00 | 26 | Doctoral or professional degree | None | None |
| Electronics Engineers, Except Computer | 0.71 | 0.70 | $ 103,220.00 | 35 | Bachelor's degree | None | None |
| Environmental Scientists and Specialists, Including Health | 0.48 | 0.48 | $ 70,200.00 | 25 | Bachelor's degree | None | None |
| General and Operations Manager | 0.95 | 0.95 | $ 103,290.00 | 1643 | Bachelor's degree | 5 years or more | None |
| Nurse Practitioners | 0.79 | 0.76 | $ 118,440.00 | 123 | Master's degree | None | None |
| Computer Network Analysts | 0.49 | 0.47 | $ 87,890.00 | 123 | Bachelor's degree | None | None |
| Architects, Except Landscape and Naval | 0.32 | 0.31 | $ 82,100.00 | 18 | Bachelor's degree | None | Internship/ residency |
| Architectural and Engineering Managers | 0.64 | 0.62 | $ 125,520.00 | 53 | Bachelor's degree | 5 years or more | None |
| Medical and Health Services Managers | 0.87 | 0.84 | $ 111,690.00 | 273 | Bachelor's degree | Less than 5 years | None |
| Physician Assistants | 0.91 | 0.85 | $ 134,120.00 | 64 | Master's degree | None | None |
| Computer and Information Systems Managers | 0.54 | 0.53 | $ 118,780.00 | 154 | Bachelor's degree | 5 years or more | None |

| Occupation | LQ 2020 | LQ 2030 | Average Annual Salary | Annual Openings | Typical Entry-Level Education | Work Experience in a Related Occupation | Typical on-the-job Training |
|---|---|---|---|---|---|---|---|
| Medical Scientists, Except Epidemiologists | 0.17 | 0.16 | $ 87,220.00 | 11 | Doctoral or professional degree | None | None |
| Compliance Officers | 0.99 | 0.91 | $ 70,410.00 | 156 | Bachelor's degree | None | Moderate term |
| Veterinary Technologists and Technicians | 0.64 | 0.60 | $ 48,360.00 | 42 | Associate's Degree | None | None |
| Engineers, All Other | 0.73 | 0.71 | $ 80,030.00 | 47 | Bachelor's degree | None | None |
| Operations Research Analysts | 0.27 | 0.24 | $ 66,930.00 | 14 | Bachelor's degree | None | None |
| Lawyers | 1.02 | 0.98 | $ 121,030.00 | 295 | Doctoral or professional degree | None | None |
| Management Analysts | 0.79 | 0.73 | $ 73,180.00 | 429 | Bachelor's degree | Less than 5 years | None |
| Natural Sciences Managers | 0.28 | 0.25 | $ 109,160.00 | 9 | Bachelor's degree | 5 years or more | None |
| Dietitians and Nutritionists | 0.86 | 0.86 | $ 66,510.00 | 30 | Bachelor's degree | None | Internship/ residency |
| Zoologists and Wildlife Biologists | 0.30 | 0.23 | $ 67,070.00 | 2 | Bachelor's degree | None | None |
| Atmospheric and Space Scientists | 0.67 | 0.49 | $ 99,750.00 | 2 | Bachelor's degree | None | None |

| Occupation | LQ 2020 | LQ 2030 | Average Annual Salary | Annual Openings | Typical Entry-Level Education | Work Experience in a Related Occupation | Typical on-the-job Training |
|---|---|---|---|---|---|---|---|
| Dentists, General | 0.92 | 0.85 | $ 184,750.00 | 23 | Doctoral or professional degree | None | None |
| First-Line Supervisors of Non-Retail Sales Workers | 1.02 | 0.96 | $ 63,150.00 | 199 | High School diploma or equivalent | Less than 5 years | None |
| Diagnostic Medical Sonographers | 0.62 | 0.60 | $ 79,510.00 | 27 | Associate's Degree | None | None |
| Family Medicine Physicians | 0.87 | 0.80 | $ 198,870.00 | 18 | Doctoral or professional degree | None | Internship/ residency |
| Chemists | 0.23 | 0.23 | $ 79,580.00 | 12 | Bachelor's degree | None | None |
| Radiologic Technologists and Technicians | 0.73 | 0.68 | $ 71,940.00 | 69 | Associate's Degree | None | None |
| First-Line Supervisors of Landscaping Lawn Service | 0.79 | 0.73 | $ 54,150.00 | 98 | High School diploma or equivalent | Less than 5 years | None |

## Most Salient Points of Targeted Occupation Analysis for Southern Nevada

- LVGEA and its partners commissioned a third Workforce Blueprint working with the State of Nevada Governor's Office on Economic Development and Southern Nevada partners. The LVGEA Workforce Blueprint (2022) identified 100 occupations to be targeted in order to meet the labor force needs of the targeted industries.
- For many traditional economic development researchers and practitioners, regional economic analysis has meant examining only industrial strengths and weaknesses and developing strategies to replace declining industries and enhance county economic competitiveness.
- Recently, regional competitiveness has become increasingly dependent upon local knowledge bases and worker quality. Economic development activities that target occupations provide a different angle in formulating development targets. For instance, a computer programmer in one economic sector could transfer to another economic sector if needed.
- Workers who perform similar tasks can easily move between industries with minimal training. Strategies that target sole industries may overlook occupation-based opportunities across industries. For this reason, economic development practitioners need to pay attention to the functions that local workers perform as to the output they produce.
- Using procedures outlined by Michael Porter for economic clustering, the 2022 Workforce Blueprint for Southern Nevada 100 occupations were clustered as Stars, Mature, Emerging, and transforming occupations.
- Star occupations of the LVGEA 100 are characterized as occupations that have concentrated in Southern Nevada in 2020 and are forecasted to increase their concentration in the area by 2030. Commercial pilots, civil engineers, and teachers in elementary and middle schools are examples of Star occupations.
- Mature occupations of the LVGEA 100 are characterized as occupations that have concentrated in Southern Nevada in 2020 but are forecasted to decrease their concentration by 2030. Financial managers, registered nurses, and surveyors are examples of Mature occupations.

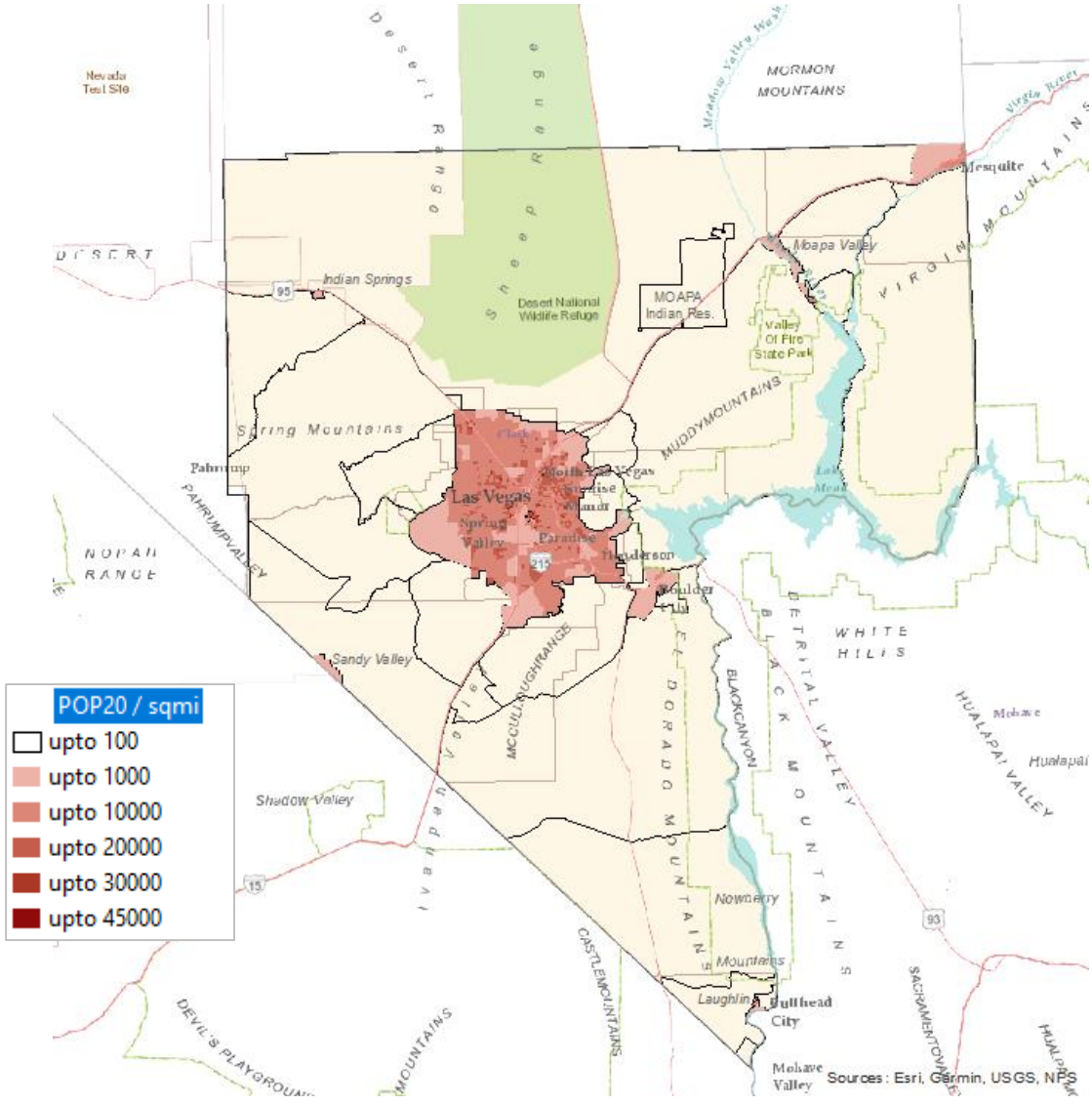
- Emerging occupations of the LVGEA are characterized as occupations that have less concentration in Southern Nevada in 2020 but their concentration is forecasted to increase in 2030. Electrical engineers, mechanical engineers, and secondary school teachers are examples of Emerging occupations.
- Transforming occupations of the LVGEA 100 are characterized as occupations that have less concentration in Southern Nevada in 2020 and this concentration is forecasted to decrease by 2030. Lawyers, veterinarians, and general operations managers are examples of Transforming occupations.

## V. K-12 School System in Clark County, 2019-2022

The Clark County School District is conterminous with Clark County, which is geographically large and unevenly settled (Fig 3). CCSD operates over 700 schools at primary, intermediate, and secondary levels, organized in 36 school zones (brown outlines on Figure 3), which vary greatly in size between the rural outskirts and Las Vegas metro area.

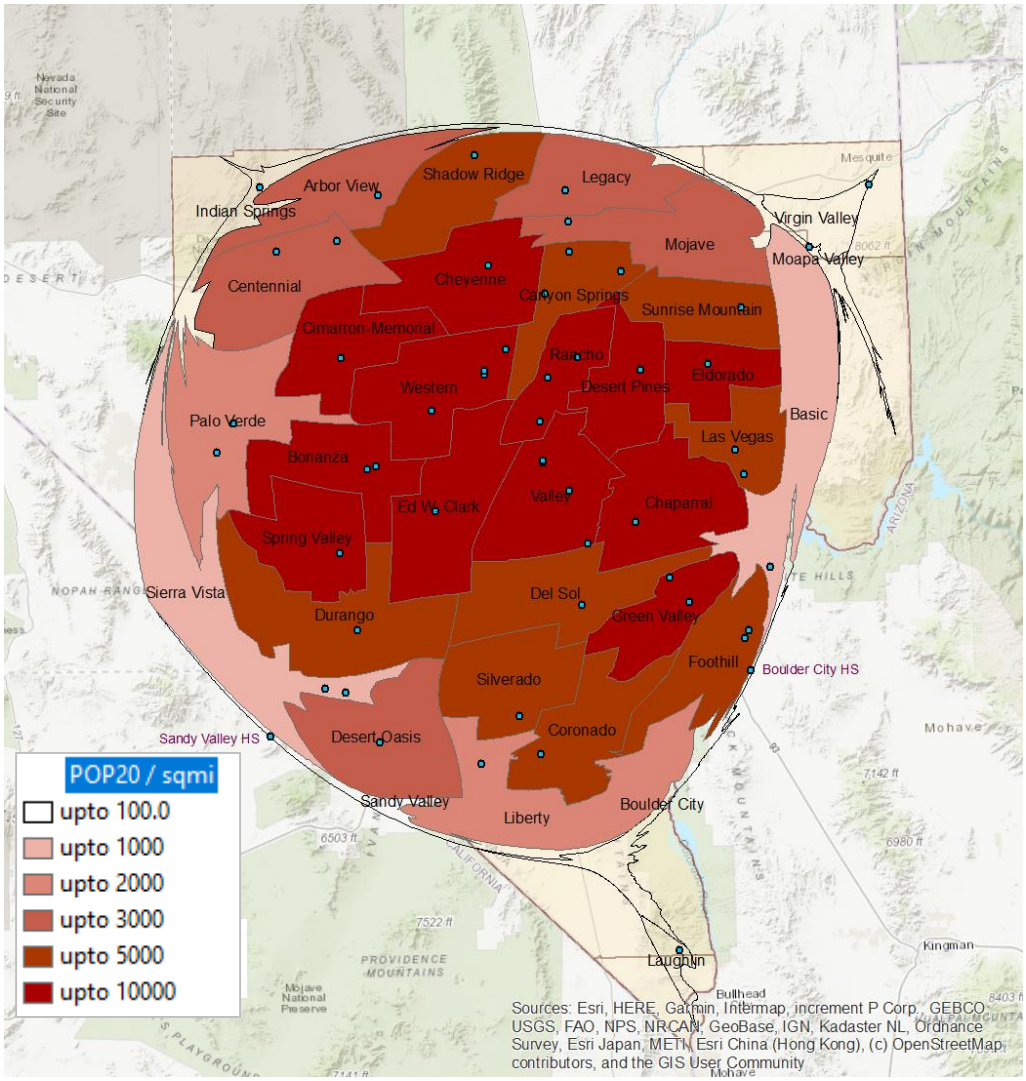
(Source: 2020 Census; brown outlines are CCSD zones; black outlines delineate rural block-groups)

**Figure 3: Map of Population density across Clark County**



CCSD's 53 high schools (Table 12) are the focus of this study, all but five of which are metro areas.[5] To reveal more detail within the Las Vegas urban core while still showing all of Clark County, for the CCSD attendance zones in particular, a cartogram process (Gastner & Newman, 2004) is used. Specifically, throughout this study, the attendance zones are sized according to their total population (a proxy for students at all grade levels) while retaining the zones shapes as much as possible (Figure 4).

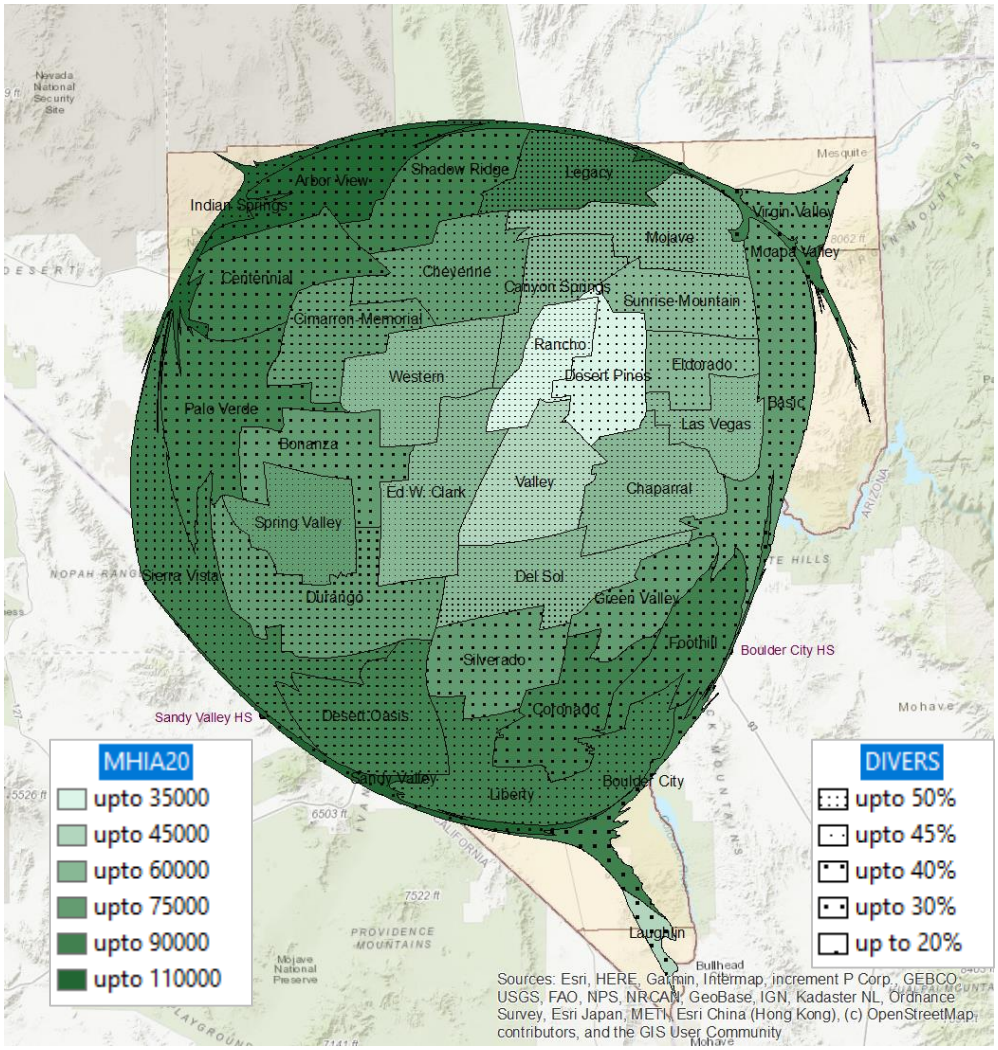
**Figure 4: Cartogram of CCSD Attendance Zones sized by total population**




[5] The five schools that are in non-metro areas are: Laughlin, Sandy Valley, Indian Springs, Moapa Valley, and Virgin Valley.

The essential demographics of the Las Vegas metro area are summarized in Figure 5, which combines Median Household Income, and Ethnic Diversity (Jensen et al. 2021) both based on 2020 (5-year) American Community Survey data, the block-group level, the smallest geography made publicly available. The coinciding of high density with low income and ethnic diversity is obvious.

**Figure 5: Cartogram of Median Household Income and Ethnic Diversity in CCSD attendance zones**

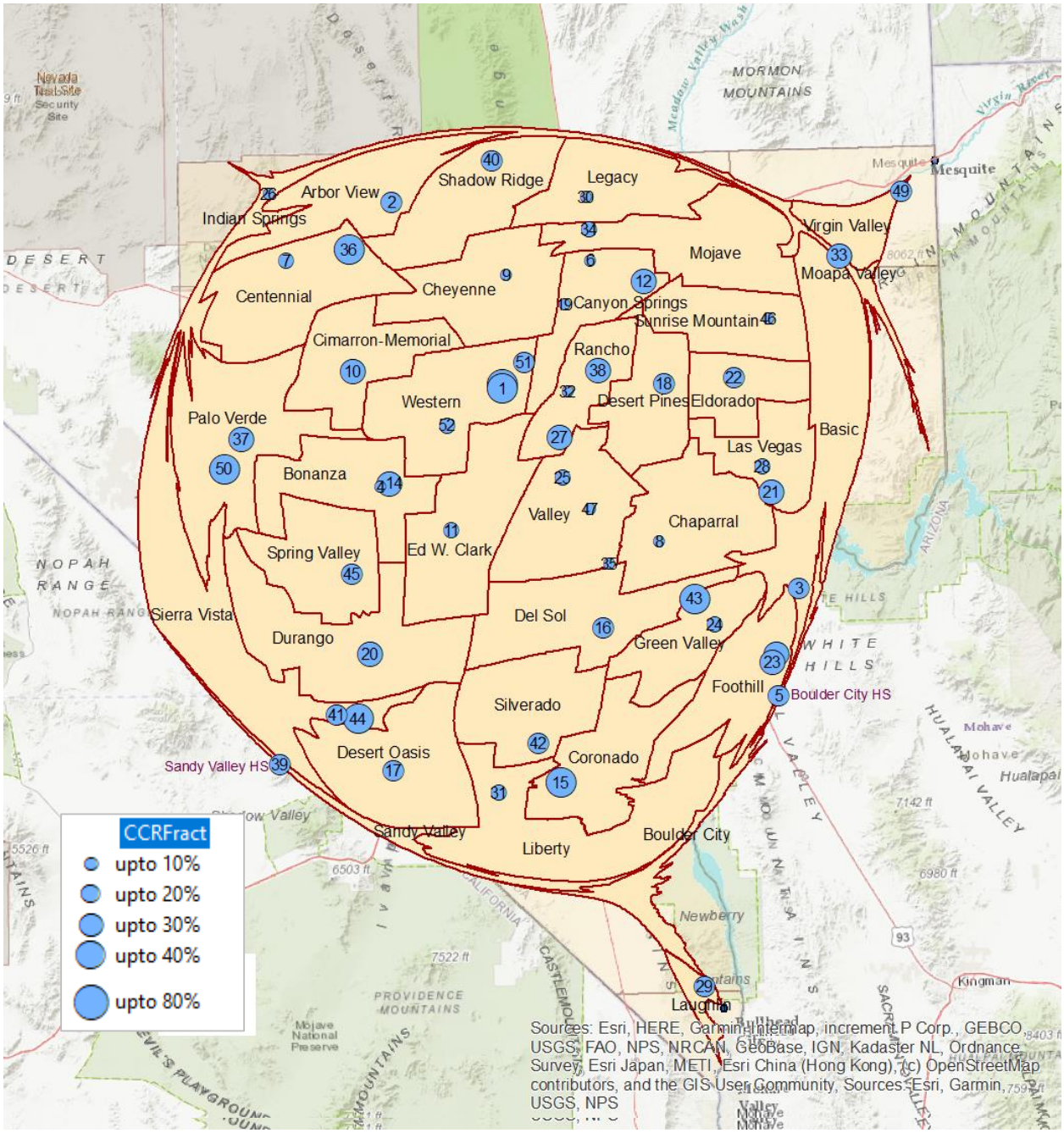



CCSD deals with these realities every day. Over half of its metro schools have Title I designations, i.e., receiving supplemental Federal financial support for students, teachers, and administration. Within the Title I schools, nine have Magnet designations, specializing, often practical, subjects beyond the basic district-wide curriculum, which may capture students'

attention. A student who is admitted to a Magnet program may attend the school irrespective of their regular attendance zone; inter-zone transportation is still a barrier in many cases.

Two important measures of CCSD high school student achievement are their ACT Score, generally taken in the Junior year, and earning a College & Career Ready (CCR) diploma. Because the ACT test is administered nationally, and treated consequentially in college applications, it is widely considered a better metric than GPA, which varies across schools, districts, and years. A CCR diploma further stipulates that a student has earned a minimum 18 points on the English portion of the ACT and 22 points on the Math portion. Average CCSD student achievements in the ACT and CCR metrics over the four academic years 2019-2022 are shown in Figure 5 and Figure 6 respectively. A more detailed view of CCSD student achievement and CTE participation is included in Appendices 2 and 3.

**Figure 6: Average ACT-Composite scores of graduates of CCSD high schools by zone (2019-2022)**




Number next to symbol indexes to high school in Table 5.1.

**Table 12: CCSD High Schools, Designations, and Attendance Zones; Rurals italicized**

| School Code | School Name | Magnet | Title | Zone |
|---|---|---|---|---|
| 1 | A-Tech | Entire School | | Western |
| 2 | Arbor View High School | | | Arbor View |
| 3 | Basic Academy of International Studies | Within a School | Title I | Basic Academy |
| 4 | Bonanza High School | | Title I | Bonanza |
| 5 | Boulder City High School | | | Boulder City |
| 6 | Canyon Springs High School | Within a School | Title I | Canyon Springs |
| 7 | Centennial High School | | | Centennial |
| 8 | Central Technical Training Academy | Entire School | | Valley |
| 9 | Chaparral High School | | Title I | Chaparral |
| 10 | Cheyenne High School | | Title I | Cheyenne |
| 11 | Cimarron-Memorial High School | | Title I | Cimarron-Memorial |
| 12 | Clark High School | Within a School | Title I | Ed W. Clark |
| 13 | CSN High School - East | | | Canyon Springs |
| 14 | CSN High School - South | | | Foothill |
| 15 | CSN High School - West | | | Bonanza |
| 16 | Coronado High School | | | Coronado |
| 17 | Del Sol Academy of the Performing Arts | Within a School | Title I | Del Sol |
| 18 | Desert Oasis High School | | | Desert Oasis |
| 19 | Desert Pines High School | Within a School | Title I | Desert Pines |
| 20 | Desert Rose High School | | | Canyon Springs |
| 21 | Durango High School | | Title I | Durango |
| 22 | East CTA | Entire School | Title I | Las Vegas |
| 23 | Eldorado High School | Within a School | Title I | Eldorado |
| 24 | Foothill High School | | | Foothill |
| 25 | Green Valley High School | | | Green Valley |
| 26 | Global Community High School | | Title I | Valley |
| *27* | *Indian Springs High School* | | *Title I* | *Indian Springs* |
| 28 | Las Vegas Academy of the Arts | Entire School | | Rancho |

| School Code | School Name | Magnet | Title | Zone |
|---|---|---|---|---|
| 29 | Las Vegas High School | Entire School | Title I | Las Vegas |
| *30* | *Laughlin Junior/ Senior High School* | | *Title I* | *Laughlin* |
| 31 | Legacy High School | | Title I | Legacy |
| 32 | Liberty High School | | | Liberty |
| 33 | Mission High School | | Title I | Rancho |
| *34* | *Moapa Valley High School* | | | *Moapa Valley* |
| 35 | Mojave High School | | Title I | Mojave |
| 36 | Nevada Learning Academy at CCSD | | | Valley |
| 37 | Northwest CTA | Entire School | | Centennial |
| 38 | Palo Verde High School | | | Palo Verde |
| 39 | Rancho High School | Within a School | Title I | Rancho |
| *40* | *Sandy Valley Junior/ Senior High School* | | *Title I* | *Sandy Valley* |
| 41 | Shadow Ridge High School | | | Shadow Ridge |
| 42 | Sierra Vista High School | | Title I | Sierra Vista |
| 43 | Silverado High School | | | Silverado |
| 44 | Southeast CTA | Entire School | | Green Valley |
| 45 | Southwest CTA | Entire School | | Sierra Vista |
| 46 | Spring Valley High School | Within a School | Title I | Spring Valley |
| 47 | Sunrise Mountain High School | | Title I | Sunrise Mountain |
| 48 | Valley High School | Within a School | Title I | Valley |
| 49 | Veterans Tribute CTA | Entire School | | Western |
| 50 | Virgin Valley High School | | | Virgin Valley |
| 51 | West CTA | Entire School | | Palo Verde |
| 52 | West Prep High School | | Title I | Western |
| 53 | Western High School | | Title I | Western |

## Career and Technical Education (CTE)

"Career Technical Education (CTE) provides students of all ages with the academic and technical skills, knowledge, and training necessary to succeed in future careers and to become lifelong learners. In total, about 12.5 million high school and college students are enrolled in CTE across the nation. CTE prepares these learners for the world of work by introducing them to workplace competencies and makes academic content accessible to students by providing it in a hands-on context. In fact, the high school graduation rate for CTE concentrators is about 90 percent – 15 percentage points higher than the national average.

"The National Career Clusters Framework serves as an organizing tool for Career Technical Education (CTE) programs, curriculum design and instruction. There are 16 Career Clusters in the National Career Clusters Framework, representing 79 Career Pathways to help learners navigate their way to greater success in college and career. The framework also functions as a useful guide in developing programs of study bridging secondary and postsecondary systems and for creating individual student plans of study for a complete range of career options. As such, it helps learners discover their interests and their passions, and empowers them to choose the educational pathway that can lead to success in high school, college and career."

Below are the 16 nationally recognized Career Clusters:

- Agriculture, Food & Natural Resources
- Architecture & Construction
- Arts, A/V Technology & Communications
- Business Management & Administration
- Education & Training
- Finance
- Government & Public Administration
- Health Science

- Hospitality & Tourism
- Human Services
- Information Technology
- Law, Public Safety, Corrections & Security
- Manufacturing
- Marketing
- Science, Technology, Engineering & Mathematics
- Transportation, Distribution & Logistics

Based on both official Nevada Department of Employment, Training, and Rehabilitation figures as well as those offered by the Las Vegas Global Economic Alliance, three top sectors in the region for high-demand, high-pay jobs are Education & Training, Health Science, and Information Technology. Hospitality & Tourism, which includes food service, gaming, and hotel accommodation, and is another important sector of long-standing in Nevada; but it suffers from chronically low wages and offers no meaningful career paths. Similarly, Transportation, Distribution & Logistics (warehousing and shipping) is an established business sector, with somewhat better wages but little future. The other Career Clusters offer no strong need or comparative advantage to Nevada students over those in other states.

### Most Salient Points of the K-12 School System in Clark County are:

- The Federal CTE initiative provides substantial, recurring [annually >$12 million] funds for both secondary and post-secondary education in Nevada, which can be broadly directed to the State's particular economic development purposes.
- Within the State, CTE programs can be tailored to create a common path for both original workforce skilling in high schools, and subsequent re-skilling in community colleges on a continuing basis

- Dual Enrollment between secondary and post-secondary institutions is an important feature of CTE programs, which can help guide Nevada high school students into NSHE and at the same time address teacher shortages in our high schools
- Improved data collection and reporting systems in support of CTE programs are needed to track/support students between Nevada high schools and NSHE institutions; persistent, common identifiers for both students and course offerings is essential
- The CTE Career Cluster framework provides a cogent and stable alternative to NAICS and SOC systems for planning workforce development; cross-walks back from those systems to the clusters will allow economic progress to be tracked via regular statistics

## VI. Quantitative Analysis of K-12 School System Outcomes 2019-2022

In this part of the report, we are presenting results from a quantitative analysis of the Career and Technical Education (CTE) programs in the Clark County School District. The School District is made up of 36 school zones which are listed in Table 13 together with land area, total population, population density (population per square mile), housing density (number of housing units per square mile) and median household income. Appendix 4 provides a list of 66 CTE programs used in the analysis.

For our analysis, we pooled data on 168,471 students from the Clark County School District for the years ending from 2019 to 2022. Table 14 provides descriptive statistics on our dataset. Some of the noteworthy statistics are as follows:

- The average ACT score for the data on all students is 17.42 points with the range from 1 to 36. The average GPA at graduation is 2.739.
- The average dual credits earned per 100 students is 2.74. Note that 165,519 students had zero dual credits. Only 2,886 students reported positive credits that ranged between 1 and 11. For those students, the average dual credits is about 1.6 per student.
- About 12% of students have a college and career ready diploma. About 18% have a college and career ready or advanced diploma.
- 10.6% of the students received an individualized education and about 13% needed English language support.
- 48.8% of the students are female. 75.4% of students are non-white, broken down as 46.8% Hispanic, 13.5% Black and the rest are Asian or Pacific Islander, Indigenous, or multiracial students.
- Average median household income in the school zones was $65,758 in 2020 with 4,333 population per square mile and 1,720 housing units per square mile.

**Table 13: School Zone Names and Descriptive Information**

| Zone Id | School Zone Name | Land Area | Total Population | Population Density | Housing Density | Median Household Income |
|---|---|---|---|---|---|---|
| 1 | Laughlin | 112.28 | 8,934 | 79.57 | 50.90 | 36,883 |
| 2 | Sandy Valley | 710.29 | 8,466 | 11.92 | 4.63 | 109,178 |
| 3 | Liberty | 82.20 | 99,894 | 1,215.21 | 547.37 | 86,892 |
| 4 | Coronado | 16.50 | 68,070 | 4,125.08 | 1,813.65 | 89,320 |
| 5 | Foothill | 21.85 | 70,775 | 3,239.56 | 1,315.00 | 82,364 |
| 6 | Desert Oasis | 39.35 | 92,029 | 2,338.72 | 852.55 | 86,761 |
| 7 | Silverado | 14.76 | 68,761 | 4,660.03 | 2,073.06 | 71,573 |
| 8 | Green Valley | 9.63 | 54,861 | 5,699.26 | 2,431.96 | 70,588 |
| 9 | Del Sol | 18.38 | 71,713 | 3,902.09 | 1,905.42 | 52,004 |
| 10 | Durango | 26.04 | 101,853 | 3,910.93 | 1,766.26 | 72,659 |
| 11 | Boulder City | 1,386.63 | 18,766 | 13.53 | 7.10 | 76,803 |
| 12 | Spring Valley | 9.60 | 66,034 | 6,877.11 | 2,856.38 | 67,062 |
| 13 | Chaparral | 12.12 | 87,137 | 7,190.41 | 2,909.60 | 48,000 |
| 14 | Sierra Vista | 396.63 | 105,061 | 264.88 | 101.11 | 89,462 |
| 15 | Valley | 10.19 | 75,122 | 7,371.26 | 3,791.02 | 44,523 |
| 16 | Bonanza | 11.57 | 67,366 | 5,822.07 | 2,424.47 | 60,950 |
| 17 | Las Vegas | 12.12 | 40,863 | 3,372.76 | 1,062.18 | 55,920 |
| 18 | Ed W. Clark | 14.80 | 79,096 | 5,343.46 | 2,735.77 | 51,875 |
| 19 | Eldorado | 7.19 | 43,871 | 6,102.50 | 1,901.23 | 48,387 |
| 20 | Western | 10.38 | 80,916 | 7,798.46 | 2,788.67 | 46,615 |
| 21 | Rancho | 5.56 | 41,293 | 7,423.49 | 2,738.71 | 34,270 |
| 22 | Desert Pines | 6.05 | 59,553 | 9,845.77 | 3,453.04 | 34,963 |
| 23 | Palo Verde | 49.45 | 94,715 | 1,915.31 | 890.69 | 86,161 |
| 24 | Sunrise Mountain | 12.29 | 52,146 | 4,244.07 | 1,396.87 | 47,997 |
| 25 | Cimarron-Memorial | 9.42 | 68,262 | 7,243.65 | 3,037.55 | 60,413 |
| 26 | Canyon Springs | 9.37 | 45,459 | 4,851.11 | 1,526.44 | 48,086 |
| 27 | Basic | 218.43 | 100,305 | 459.20 | 187.38 | 66,838 |
| 28 | Cheyenne | 14.78 | 78,380 | 5,304.23 | 1,861.76 | 63,750 |
| 29 | Centennial | 31.57 | 81,863 | 2,592.80 | 1,021.06 | 86,975 |
| 30 | Mojave | 35.12 | 79,320 | 2,258.32 | 748.30 | 58,207 |
| 31 | Shadow Ridge | 21.79 | 74,561 | 3,422.30 | 1,264.16 | 86,345 |
| 32 | Legacy | 31.97 | 65,222 | 2,040.08 | 692.64 | 75,738 |
| 33 | Arbor View | 33.98 | 71,822 | 2,113.67 | 762.04 | 95,204 |
| 34 | Virgin Valley | 394.98 | 21,427 | 54.25 | 29.16 | 63,406 |
| 35 | Indian Springs | 2,270.44 | 14,308 | 6.30 | 1.67 | 106,133 |
| 36 | Moapa Valley | 1,994.09 | 7,238 | 3.63 | 1.52 | 77,410 |

**Table 14: Descriptive Statistics for CCSD Student Dataset (All Student Data, 2019-2022)**

| Variables | (1) Number of obs. | (2) Mean | (3) Standard deviation | (4) Min | (5) Max |
|---|---|---|---|---|---|
| ACT Score | 103,637 | 17.42 | 4.945 | 1 | 36 |
| GPA at Graduation | 84,322 | 2.739 | 0.779 | 0 | 4 |
| Dual Credits Earned (per 100 students) | 168,405 | 2.74 | 2.75 | 0 | 11 |
| CTE Completion | 168,471 | 0.0810 | 0.273 | 0 | 1 |
| Diploma Type (College & Career Ready = 1) | 168,471 | 0.124 | 0.329 | 0 | 1 |
| Diploma Type (CCR or Advanced Diploma) | 168,471 | 0.181 | 0.385 | 0 | 1 |
| Female Student | 168,471 | 0.488 | 0.500 | 0 | 1 |
| Nonwhite Student | 168,471 | 0.754 | 0.431 | 0 | 1 |
| Black Student | 168,471 | 0.135 | 0.341 | 0 | 1 |
| Hispanic Student | 168,471 | 0.468 | 0.499 | 0 | 1 |
| Individualized Education Plan | 168,471 | 0.106 | 0.307 | 0 | 1 |
| Need English Language Support | 168,471 | 0.131 | 0.337 | 0 | 1 |
| Median Household Income (in the school zone) | 168,471 | 65,758 | 18,136 | 34,270 | 109,178 |
| Population per Square Mile (in the school zone) | 168,471 | 4,333 | 2,445 | 3.630 | 9,846 |
| Total Housing Units per Square Mile (in the school zone) | 168,471 | 1,720 | 1,006 | 1.524 | 3,791 |

We find significant differences between CTE completers and other students in terms of education outcomes and other demographic indicators. School zone control variables were utilized to ensure that some factors that are specific to that school zone (i.e. income and demographic factors) are accounted for in the analysis. The differences are in Table 15.

Our findings show that:

- The average ACT score for CTE completers is 21.37 compared to 16.83 for other students.
- The average GPA at graduation for CTE completers is 3.334 compared to 2.625 for other students.
- The average dual credits per 100 students for CTE completers is 8.44 which is almost four times the credits for other students.

- There is also a big difference between the two groups in terms of college and career ready (or advanced) diplomas. 69.4% of CTE completers had college and career ready diplomas compared to only 7.32% of other students.
- CTE completers are less likely to have Individualized Education Plans (IEPs) and to be in need of English language support. They are also less likely to be nonwhite compared to those who did not complete a CTE program.
- In terms of other school zone control variables, CTE completers are more likely to be from a zone with higher median household income and lower population and housing density.

**Table 15: Descriptive Statistics for CCSD Student Dataset (CTE Completers vs. Other Students)**

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | **Non-CTE Completers** | | **CTE Completers** | |
| **Variables** | **Number of obs.** | **Mean** | **Number of obs.** | **Mean** |
| ACT Score | 90,117 | 16.83 | 13,520 | 21.37 |
| GPA at Graduation | 70,810 | 2.625 | 13,512 | 3.334 |
| Dual Credits Earned (per 100 students) | 154,753 | 2.24 | 13,652 | 8.44 |
| Diploma Type (CCR = 1) | 154,819 | 0.0732 | 13,652 | 0.694 |
| Diploma Type (CCR/Advanced Diploma) | 154,819 | 0.126 | 13,652 | 0.796 |
| Female Student | 154,819 | 0.484 | 13,652 | 0.537 |
| Nonwhite Student | 154,819 | 0.762 | 13,652 | 0.669 |
| Black Student | 154,819 | 0.141 | 13,652 | 0.0587 |
| Hispanic Student | 154,819 | 0.475 | 13,652 | 0.393 |
| Individualized Education Plan | 154,819 | 0.113 | 13,652 | 0.0188 |
| Need English Language Support | 154,819 | 0.141 | 13,652 | 0.0185 |
| Median Household Income | 154,819 | 65,429 | 13,652 | 69,484 |
| Population per Square Mile | 154,819 | 4,365 | 13,652 | 3,978 |
| Total Housing Units per Square Mile | 154,819 | 1,737 | 13,652 | 1,531 |

In the next part of our analysis, we rearranged the data to look at average indicators for school zones. We are presenting some key education indicators in the scatter plots in Figures 7 to 14.

Figure 7 shows a moderate positive correlation (0.58) between average ACT score in a school zone and the percent share of CTE completion, indicating that the average ACT scores increase

in the school zones as the number of CTE completers increases. There are 10 school zones that have a high percentage of CTE completers and high ACT scores, reflected in the top right quadrant. Of importance is the dispersion of school zones across the four quadrants, indicating many school zones located in the bottom left quadrant. This demonstrates 18 school zones that have a low percentage of CTE completers and low ACT scores.

**Figure 7: ACT Score vs. CTE Completion**

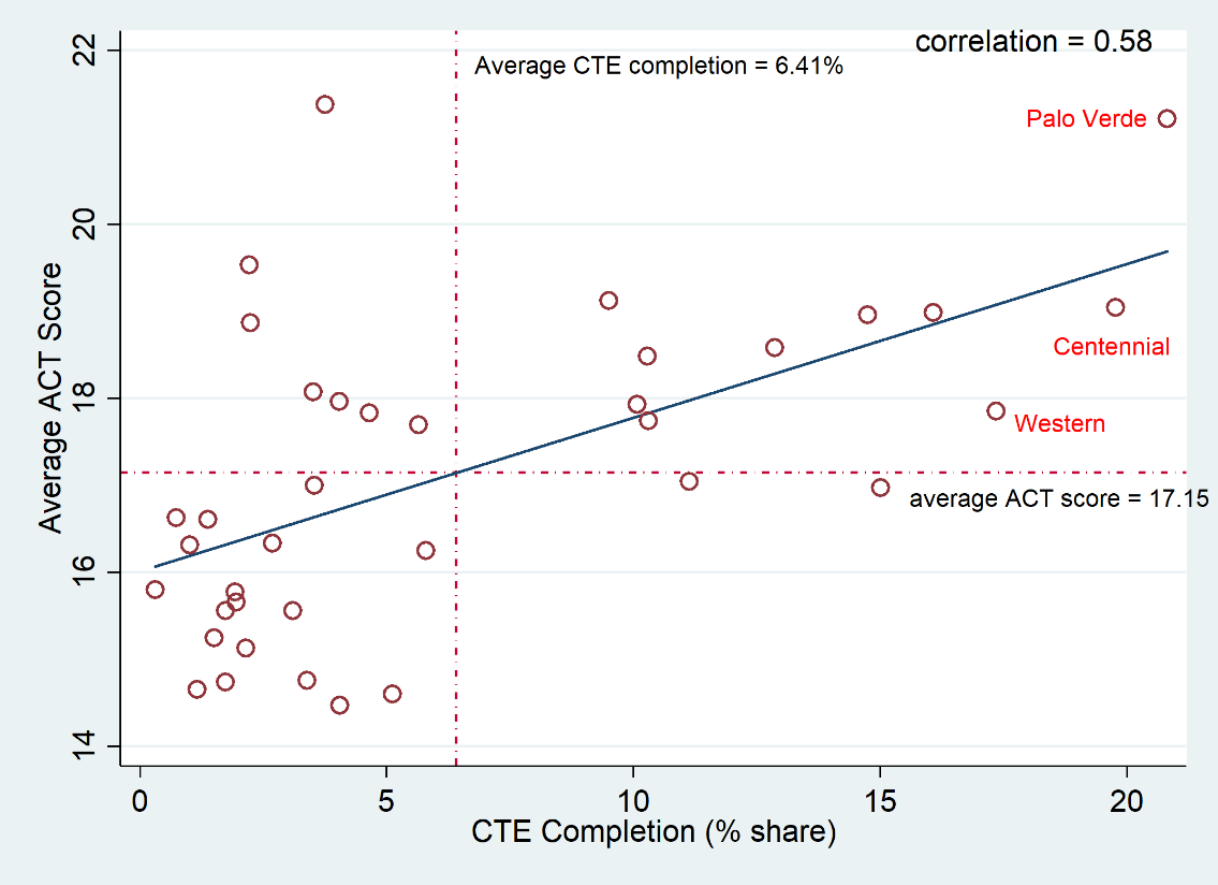
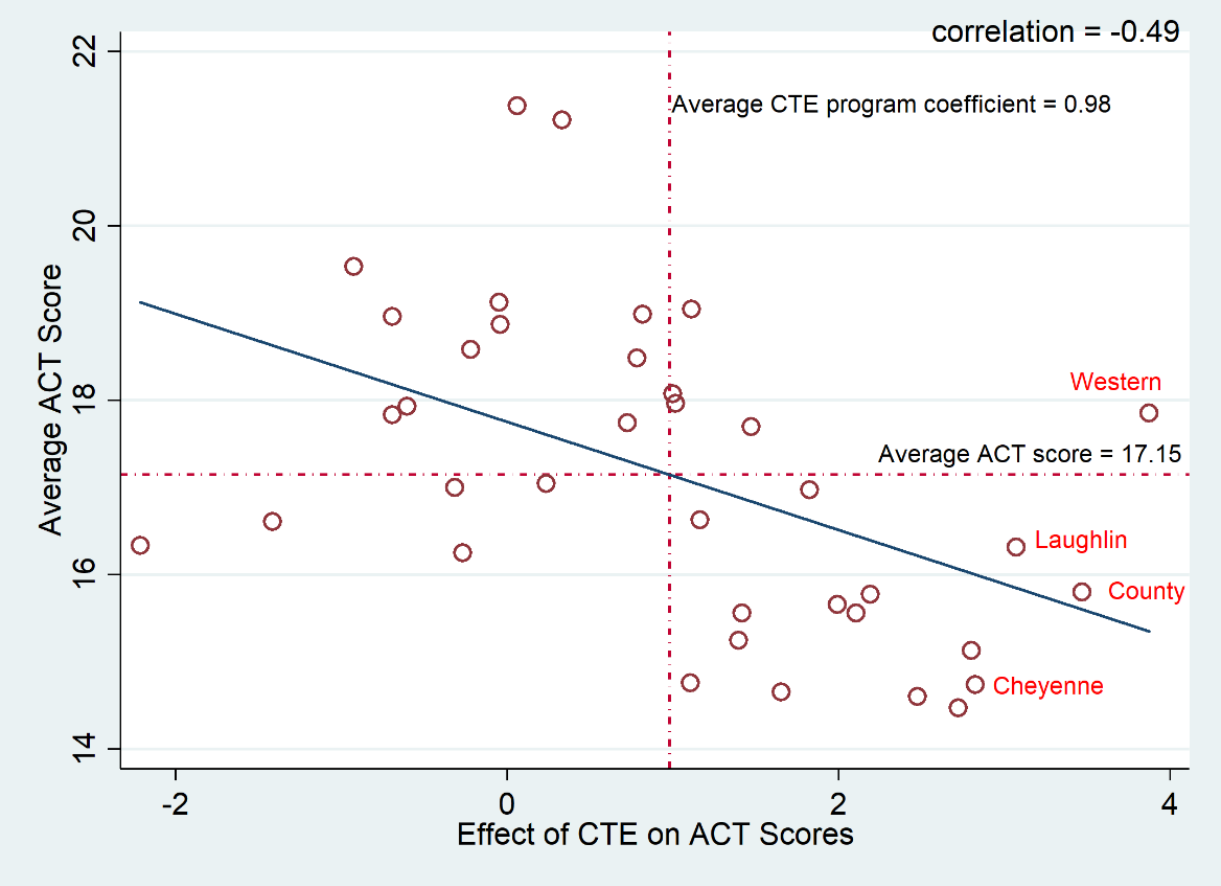



Figure 8 shows the relationship between average ACT score and the estimated effect (regression coefficient) of the CTE program on ACT scores in school zones. There is a moderate, negative correlation (-0.49) between the variables. Those school zones with low average ACT scores tend to have a bigger impact from CTE programs. This could be because those low-performing school zones, having much lower ACT scores on average, have more room to grow and benefit more from the CTE program participation and the variety of CTE programs. It is also possible that

some of the CTE programs are more aligned with trade industries and are not necessarily for college bound students. Note that one needs to be careful about the causal link here. While we expect that CTE programs provide significant benefits to students in terms of student engagement, motivation, career guidance and timely graduation, it is also possible that students who are already performing well are attracted more to CTE programs. Therefore, we cannot rule out the possibility of reverse causation in this case. The important thing to note here is that CTE participation is not randomly distributed among students. Students may indeed self-select.

**Figure 8: ACT Score vs. CTE Coefficients**




There is even a higher positive correlation of 0.73 between average ACT score and the percent share of College and Career Ready Diplomas in the school zones as shown in Figure 9. There is also a similar positive correlation if Advanced Diploma is added to the diploma share variable. Those students who have received College and Career Ready Diplomas or Advanced Diplomas tend to have significantly higher ACT scores than those who receive Standard Diplomas. One

possible reason could be the requirements set for each diploma.[6] The Standard Diploma is much less rigorous than the College and Career Ready Diploma and Advanced Diploma.

**Figure 9: ACT Score vs. Career & College Ready Diploma (% share)**

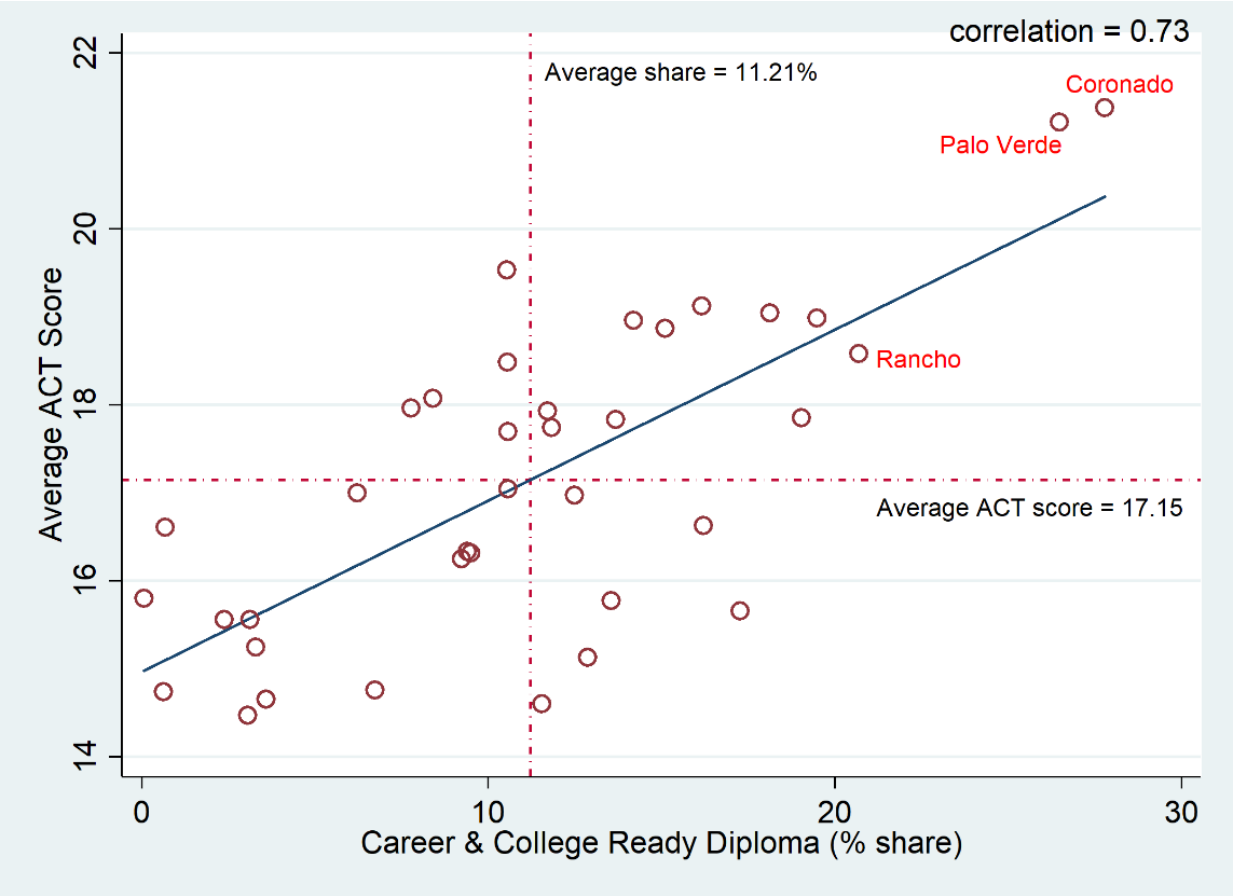
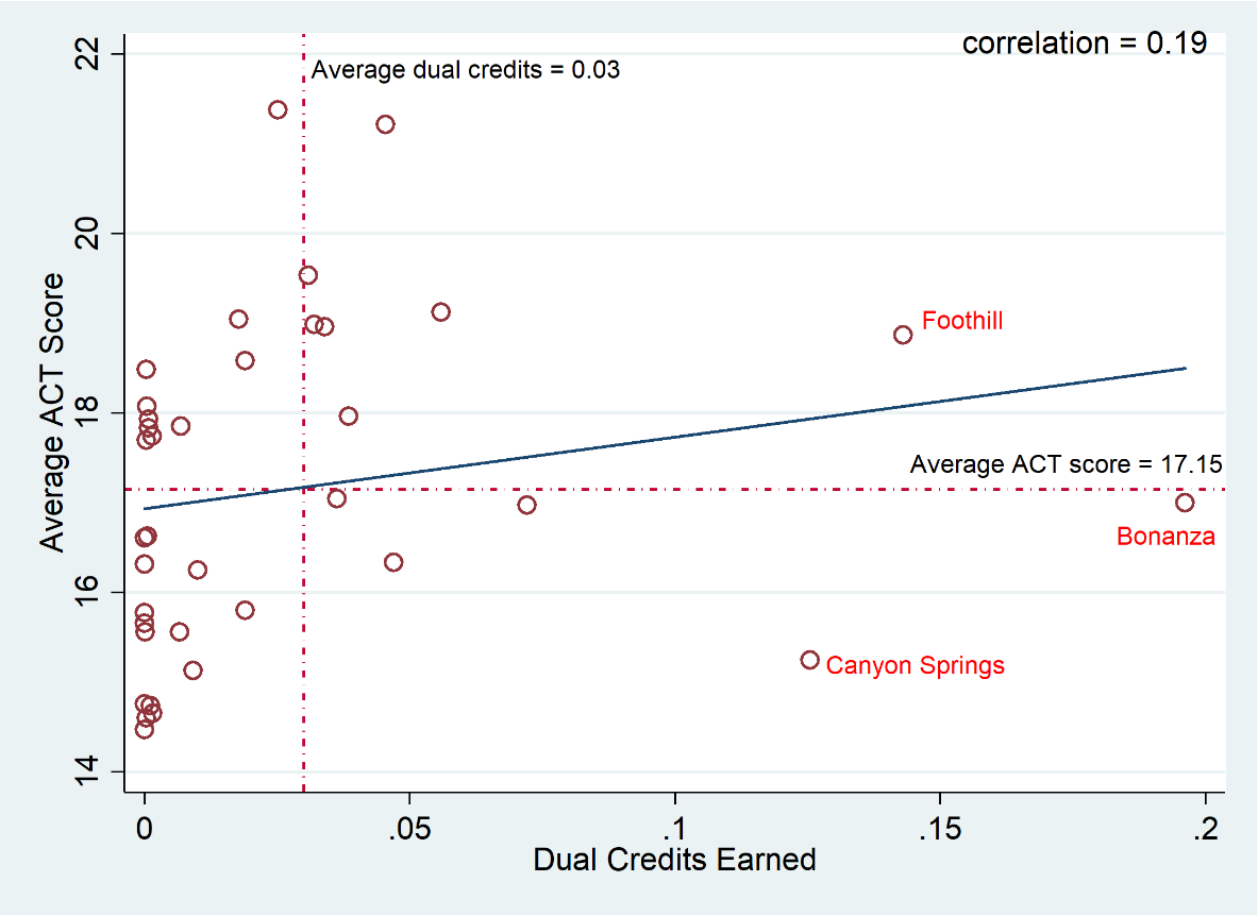



Figure 10 shows that there is also a positive correlation between average ACT score and average dual enrollment credits earned in school zones, but the correlation is much lower at 0.19 as it is also indicated by a relatively flat fitted line. The average number of dual credits earned in school

[6] The Standard Diploma requires the completion of 23 credits. Whereas the Advanced Diploma requires the completion of 24 credits WITH a minimum GPA of 3.25 (weighted or unweighted. The College and Career Ready Diploma takes the same requirements as the Advanced Diploma and has additional requirements. Additional requirements such as having a Seal of Biliteracy or the completion of no less than two credits in the approved course areas and having either a College-Ready Endorsement or a Career-Ready Endorsement. For a College-Ready Endorsement, students must meet the ACT benchmarks. Whereas for a Career-Ready Endorsement, students must pass one of the two career-readiness assessments (ACT or ASVAB), earn a CTE Skill Attainment Certificate, or obtain an industry-recognized credential.

zones is low and ranges between 0 and .2 credits per student. Although students may utilize dual credit, most students are not accessing this opportunity which decreases the average utilization significantly. The positive relationship between ACT scores and dual credits earned indicates a potential growth opportunity for CCSD to lead more students toward higher post-secondary achievement. See Appendix 5 for a complete list of dual enrollment credits earned by each school.

**Figure 10: ACT Score vs. Dual Credits Earned**




Figures 11 to 13 show the average ACT score against the school zone control variables such as median household income, population density (population per square mile), and housing density (housing units per square mile). Taken together, the results conclude that school zones with higher median household income, lower population and housing densities tend to have higher average ACT scores.

Figure 11 shows a positive relationship with a correlation of 0.51, indicating that students located in school zones that are more affluent are more likely to have higher ACT scores.

**Figure 11: ACT Score vs. Median Household Income**

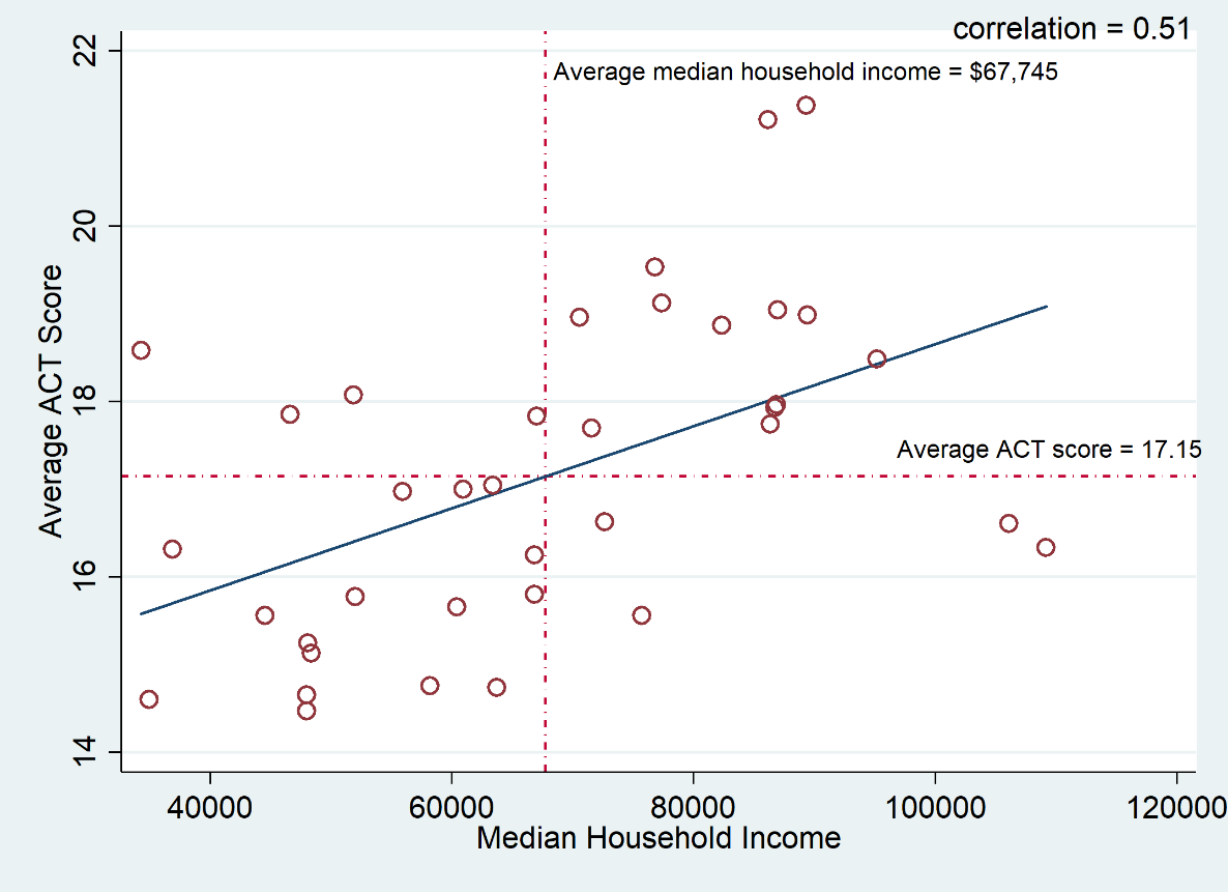
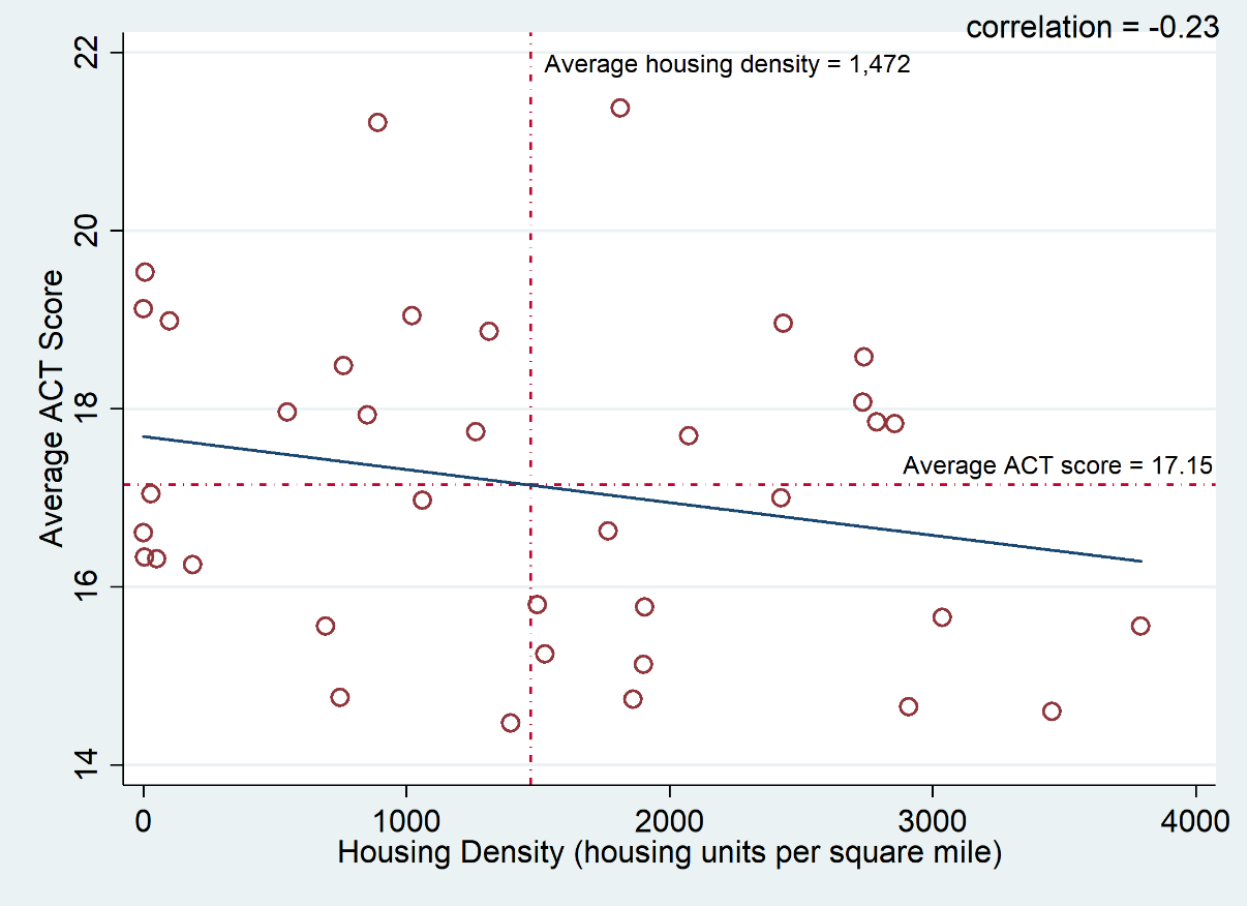


Figure 12 shows a negative relationship with a correlation of -0.29, indicating that students residing in school zones that are more populous are more likely to score lower on their ACT scores. For example, students residing in more populous school zones, such as Desert Pines, Chaparral, Rancho, Western, Cimarron-Memorial, and Valley, score on average lower on the ACT (see Table 20).

**Figure 12: ACT Score vs. Population Density**

Figure 13 demonstrates a negative relationship (-0.23) between housing density, or the number of houses within the school zone, and ACT scores, indicating as the number of houses within a school zone increases, the average score on the ACT decreases.

**Figure 13: ACT Score vs. Housing Density**




Next, we ran a regression analysis using the full student dataset from CCSD with ACT score as the dependent variable and CTE program completion and other indicators used as explanatory variables.

In Table 16, we regressed ACT score on variables indicating whether the student completed a CTE program, received a College and Career Ready Diploma, is nonwhite, is female, received individualized education, and needs English language support. We also used the number of dual credits earned and interactions of these variables with the CTE variable in the regressions. Finally, we included school zone fixed effects to control for any zone-specific factors in the regressions in columns 2 and 4.

- The results show a consistently positive and statistically significant regression coefficient for the CTE completion variable. The estimated coefficient ranges from 0.858 to 2.513. Those students that have completed a CTE program score about 0.9-2.5 points higher on the ACT than students who did not complete a CTE program.
- We find even greater estimated coefficients for the diploma type (for College and Career Ready Diplomas) where the estimated coefficient ranges from 4.262 to 4.941. Students with College and Career Ready Diplomas score about 4.3 to nearly 5 points higher on the ACT than students who did not earn a College and Career Ready Diploma. However, students who complete CTE programs with College and Career Ready Diplomas score significantly lower than those who don't complete CTE programs. One possible reason could be the kind of endorsement these students receive for their diploma. Successfully completing a CTE program can grant a student a Career-Ready Endorsement, therefore not requiring that they meet ACT benchmarks. Students who don't complete CTE programs likely have College-Ready Endorsements.
- Results show that nonwhite students have significantly lower ACT scores than white students, but those that have completed a CTE program score higher on the ACT than those that did not participate in the CTE, therefore suggesting that CTE programs improve achievement for nonwhite students who choose to participate.
- Participation in CTE programs did not impact the ACT scores of students on Individualized Education Plans. In other words, special education students did not demonstrate an increase in ACT scores as a result of participating in CTE programs.

- Students who need English language support have significantly lower ACT scores than those who do not.
- Similarly female students who have participated in CTE have even lower ACT scores compared to those that did not complete a CTE program.

Table 17 incorporates zone level controls, including of school zone fixed effects. Zone level controls utilize median household income, population density, and housing density as constant or unchanging points of comparison in the analyses. The results with school zone controls are shown in Table 6.5.

- It is also important to note that, within the CTE completers, students who have received a College and Career Ready Diploma and earned dual credits have significantly higher ACT scores compared to other students.
- Students who attend schools with more surrounding affluent communities (larger median incomes) have significantly higher ACT scores than those who do not. However, these students have significantly lower ACT scores when being CTE completers. One possible reason could be due to the availability of CTE programs in their respective zones.
- Students who attend schools in more populous areas tend to have significantly lower scores than those who do not. Additionally, being a CTE completer does not have a significant change in achievement for these students.
- Students who attend schools with more housing units tend to have significantly higher ACT scores. Additionally, being a CTE completer does not have a significant change in achievement for these students.

**Table 16: Regression results (with and without Zone fixed effects and interaction terms)**

| Variables | (1) ACT Score | (2) ACT Score with Zone Fixed Effects | (3) ACT Score with Interactions | (4) ACT Score with Interactions and Zone Fixed Effects |
|---|---|---|---|---|
| CTE Completion | 1.144*** | 0.858*** | 2.513*** | 2.377*** |
| | (0.0464) | (0.0462) | (0.0987) | (0.0981) |
| Diploma Type (College & Career Ready = 1) | 4.480*** | 4.262*** | 4.941*** | 4.758*** |
| | (0.0415) | (0.0398) | (0.0484) | (0.0457) |
| Dual Credits Earned | 1.142*** | 1.148*** | 1.088*** | 1.113*** |
| | (0.0457) | (0.0441) | (0.0493) | (0.0479) |
| Nonwhite Student | -2.082*** | -1.584*** | -2.155*** | -1.623*** |
| | (0.0319) | (0.0332) | (0.0347) | (0.0357) |
| Female Student | -0.125*** | -0.140*** | 0.0441* | 0.0200 |
| | (0.0248) | (0.0239) | (0.0261) | (0.0252) |
| Received Individualized Education | -2.979*** | -2.847*** | -2.943*** | -2.809*** |
| | (0.0322) | (0.0322) | (0.0321) | (0.0321) |
| Need English Language Support | -2.846*** | -2.547*** | -2.759*** | -2.465*** |
| | (0.0246) | (0.0257) | (0.0250) | (0.0261) |
| CTE x Diploma Type | | | -2.002*** | -2.072*** |
| | | | (0.0914) | (0.0892) |
| CTE x Dual Credits Earned | | | 0.224** | 0.0697 |
| | | | (0.113) | (0.112) |
| CTE x Nonwhite Student | | | 0.734*** | 0.492*** |
| | | | (0.0873) | (0.0862) |
| CTE x Female Student | | | -1.366*** | -1.293*** |
| | | | (0.0780) | (0.0764) |
| CTE x Individualized Education | | | 0.397 | 0.367 |
| | | | (0.269) | (0.266) |
| CTE x Need English Support | | | -1.439*** | -1.427*** |
| | | | (0.182) | (0.179) |
| Constant | 18.59*** | 17.08*** | 18.49*** | 16.91*** |
| | (0.0323) | (0.256) | (0.0348) | (0.255) |
| Zone Fixed Effects | No | Yes | No | Yes |
| Observations | 103,626 | 103,626 | 103,626 | 103,626 |
| R-squared | 0.362 | 0.404 | 0.369 | 0.410 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

**Table 17: Regressions Results (with and without Zone level controls and interaction terms)**

| Variables | ACT Score | ACT Score with Zone Controls | ACT Score with Interactions | ACT Score with Interactions and Zone Controls |
|---|---|---|---|---|
| CTE Completion | 1.144*** | 1.175*** | 2.513*** | 3.375*** |
| | (0.0464) | (0.0460) | (0.0987) | (0.352) |
| Diploma Type (College & Career Ready = 1) | 4.480*** | 4.435*** | 4.941*** | 4.886*** |
| | (0.0415) | (0.0407) | (0.0484) | (0.0472) |
| Dual Credits Earned | 1.142*** | 1.182*** | 1.088*** | 1.138*** |
| | (0.0457) | (0.0448) | (0.0493) | (0.0482) |
| Nonwhite Student | -2.082*** | -1.777*** | -2.155*** | -1.810*** |
| | (0.0319) | (0.0331) | (0.0347) | (0.0360) |
| Female Student | -0.125*** | -0.109*** | 0.0441* | 0.0602** |
| | (0.0248) | (0.0245) | (0.0261) | (0.0258) |
| Received Individualized Education | -2.979*** | -2.980*** | -2.943*** | -2.949*** |
| | (0.0322) | (0.0322) | (0.0321) | (0.0321) |
| Need English Language Support | -2.846*** | -2.602*** | -2.759*** | -2.489*** |
| | (0.0246) | (0.0254) | (0.0250) | (0.0259) |
| Population per Square Mile | | -0.000262*** | | -0.000286*** |
| | | (2.02e-05) | | (2.06e-05) |
| Total Housing Units per square mile | | 0.000896*** | | 0.000920*** |
| | | (4.46e-05) | | (4.53e-05) |
| Median Household Income | | 3.37e-05*** | | 3.55e-05*** |
| | | (1.08e-06) | | (1.14e-06) |
| CTE x Diploma Type | | | -2.002*** | -1.959*** |
| | | | (0.0914) | (0.0910) |
| CTE x Dual Credits Earned | | | 0.224** | 0.216* |
| | | | (0.113) | (0.113) |
| CTE x Nonwhite Student | | | 0.734*** | 0.511*** |
| | | | (0.0873) | (0.0901) |
| CTE x Female Student | | | -1.366*** | -1.355*** |
| | | | (0.0780) | (0.0778) |
| CTE x Individualized Education | | | 0.397 | 0.411 |
| | | | (0.269) | (0.270) |
| CTE x Need English Support | | | -1.439*** | -1.567*** |
| | | | (0.182) | (0.184) |
| CTE x Population Density | | | | 0.000138 |
| | | | | (9.22e-05) |
| CTE x Housing Density | | | | -0.000200 |

| | | | | |
|---|---|---|---|---|
| | | | | (0.000211) |
| CTE x Median Income | | | | -1.38e-05*** |
| | | | | (3.62e-06) |
| Constant | 18.59*** | 15.69*** | 18.49*** | 15.51*** |
| | (0.0323) | (0.105) | (0.0348) | (0.110) |
| Observations | 103,626 | 103,626 | 103,626 | 103,626 |
| R-squared | 0.362 | 0.374 | 0.369 | 0.381 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

We also looked at the CTE completers subsample to see if more STEM oriented CTE programs made a difference. STEM oriented CTE programs are asterisked in Appendix 4. Regressions in Table 18 show that STEM oriented CTE participation have a small positive or not significant association with ACT score of a student.

- Female students who have participated in STEM oriented CTE programs score about 0.657 and 0.709 points higher on the ACT than female students who did not complete a STEM oriented CTE program. This is noteworthy because all other analyses demonstrate that female CTE students score lower on their ACT than female non-CTE students.
- There are no significant changes in achievement (other than for female STEM Oriented CTE completers) for the other variables. This could be due to the smaller sample size.

**Table 18: Regression results for CTE Completers (with and without Zone fixed effects and interaction terms)**

| Variables | ACT Score | ACT Score with Zone Fixed Effects | ACT Score with Interactions | ACT Score with Interactions and Zone Fixed Effects |
|---|---|---|---|---|
| Completed a STEM Oriented CTE Program | 0.234*** | 0.347*** | -0.217 | -0.0789 |
| | (0.0780) | (0.0779) | (0.190) | (0.189) |
| Diploma Type (College & Career Ready = 1) | 2.947*** | 2.618*** | 2.936*** | 2.575*** |
| | (0.0775) | (0.0790) | (0.0942) | (0.0945) |
| Dual Credits Earned | 1.327*** | 1.371*** | 1.312*** | 1.439*** |
| | (0.102) | (0.104) | (0.116) | (0.118) |
| Nonwhite Student | -1.412*** | -1.235*** | -1.467*** | -1.281*** |
| | (0.0803) | (0.0832) | (0.0997) | (0.100) |
| Female Student | -1.293*** | -1.150*** | -1.541*** | -1.383*** |
| | (0.0743) | (0.0725) | (0.0913) | (0.0892) |
| Received Individualized Education | -2.547*** | -2.305*** | -2.713*** | -2.424*** |
| | (0.266) | (0.265) | (0.333) | (0.327) |
| Need English Language Support | -4.196*** | -3.686*** | -4.068*** | -3.521*** |
| | (0.180) | (0.178) | (0.217) | (0.217) |
| STEM CTE x Diploma Type | | | -0.0261 | 0.0641 |
| | | | (0.165) | (0.162) |
| STEM CTE x Dual Credits Earned | | | 0.102 | -0.269 |
| | | | (0.238) | (0.240) |
| STEM CTE x Nonwhite Student | | | 0.164 | 0.126 |
| | | | (0.168) | (0.164) |
| STEM CTE x Female Student | | | 0.709*** | 0.657*** |
| | | | (0.157) | (0.154) |
| STEM CTE x Individualized Education | | | 0.466 | 0.340 |
| | | | (0.551) | (0.549) |
| STEM CTE x Need English Support | | | -0.334 | -0.444 |
| | | | (0.386) | (0.374) |
| Constant | 20.89*** | 21.41*** | 21.09*** | 21.47*** |
| | (0.0988) | (1.670) | (0.118) | (1.662) |
| Observations | 13,520 | 13,520 | 13,520 | 13,520 |
| R-squared | 0.168 | 0.224 | 0.169 | 0.225 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

In Table 19, we show results from regressions for a pre-pandemic year (2019) graduation and post-pandemic year (2022) graduation. Regardless of the year, we see a positive and significant association between CTE program completion and ACT score, but the estimated coefficients for 2022 are higher than those for 2019. While other results are overall similar to those reported in previous regressions tables, there are few significant differences between 2019 and 2022 results.

- There is no longer a significant association between dual enrollment credits and ACT scores for 2022, whereas students who completed dual enrollment credits in 2019 scored higher, on average, on their ACT. The same could not be said for students in 2022 due to the lack of significance. In 2022, the average ACT score was significantly lowered from 2019.
- The negative associations between ACT score and nonwhite students, students that received individualized education, and students that need English language support are smaller in 2022 than in 2019. This indicates the achievement gap between nonwhite students, those on IEPs, and students who need English language support is smaller in 2022 than it was in 2019.
- The negative association between ACT score and female students is larger in 2022 than in 2019.

**Table 19: Regression results (comparing 2019 results to 2022 results)**

| Variables | ACT Score in 2019 | ACT Score in 2019 with Zone Fixed Effects | ACT Score in 2022 | ACT Score in 2020 with Zone Fixed Effects |
|---|---|---|---|---|
| CTE Completion | 1.350*** | 1.060*** | 1.839*** | 1.686*** |
| | (0.0905) | (0.0900) | (0.0978) | (0.0988) |
| Diploma Type (College & Career Ready = 1) | 4.034*** | 3.965*** | 4.052*** | 3.940*** |
| | (0.0829) | (0.0792) | (0.0880) | (0.0846) |
| Dual Credits Earned | 1.478*** | 1.462*** | 1.969 | 2.012 |
| | (0.0586) | (0.0579) | (3.174) | (3.216) |
| Nonwhite Student | -2.082*** | -1.550*** | -1.865*** | -1.446*** |
| | (0.0651) | (0.0675) | (0.0763) | (0.0792) |
| Female Student | -0.114** | -0.144*** | -0.314*** | -0.337*** |
| | (0.0518) | (0.0498) | (0.0577) | (0.0559) |
| Received Individualized Education | -3.079*** | -2.931*** | -2.673*** | -2.557*** |
| | (0.0712) | (0.0713) | (0.0706) | (0.0708) |
| Need English Language Support | -3.019*** | -2.717*** | -2.449*** | -2.238*** |
| | (0.0522) | (0.0556) | (0.0572) | (0.0601) |
| Constant | 18.59*** | 16.98*** | 17.83*** | 15.90*** |
| | (0.0665) | (0.453) | (0.0763) | (0.523) |
| Observations | 21,582 | 21,582 | 17,964 | 17,964 |
| R-squared | 0.374 | 0.425 | 0.390 | 0.428 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 20 combines the regression coefficients for CTE program completion estimated for each school zone with other student indicators. The school zones with the highest estimated coefficients (indicating greatest association between CTE and ACT score) are for Western, Cheyenne, and those schools that serve students countywide, including magnet school, academic centers, and career and technical academies (indicated by blue font). The ones with the lowest estimated coefficients are Green Valley, Spring Valley, and Desert Oasis (indicated by red font). For those three school zones, the estimated coefficients are negative indicating a negative association between CTE and ACT score. Note that there is a negative relationship between CTE coefficients and ACT scores, which we already pointed out for Figure 9.

Over the last three school years, 16.5% of CTE course enrollment was in completer courses at Desert Oasis, 6.4% at Green Valley, and 15.5% at Spring Valley. When looking at which

program was most populous, 27.43% of Desert Oasis, 40.24% of Green Valley, and 41.70% of Spring Valley's CTE course enrollment was in the Arts, A/V Technology, and Communications program cluster with photography being the most popular program. If we then observe CTE course enrollment by completer course, we see a similar trend minus Green Valley whose completer enrollment is mainly in the Business, Management and Administration program cluster. Appendix 7 has more details on the CTE enrollment by program study. It is possible that a student attending one of these three schools may only take the first course level within the program cluster (similar to an elective) and moving on. There might not be a strong enticement for these students to pursue the CTE programs at their school, whether that is due to the quality of the program or a lack of availability of other CTE programs being offered.

Looking at Western, Cheyenne, and other non-comprehensive high schools (Considering: Advanced Technologies Academy, East Career and Technical Academy, Las Vegas Academy of the Arts, Northwest Career and Technical Academy, Southeast Career and Technical Academy, Southwest Career and Technical Academy, and West Career and Technical Academy). we see a major difference from the aforementioned schools. We see a larger likelihood of students being CTE Completers. In fact, 20.27% of CTE course enrollments are in completer courses at Western, 10.39% at Cheyenne, and 29.83% at the non-comprehensive high schools. Then looking at the most populous program cluster Cheyenne's were Hospitality and Tourism and Information Technology, Western's was the Arts, A/V Technology, and Communications program cluster, and the non-comprehensive high school's was both the Arts and Information Technology program clusters. Appendices 7 and 8 have more details on the CTE enrollment by program study. So, at these schools, students who choose to participate in CTE choose a variety of the CTE program offerings at their school, instead of most participants being in just one program, especially in comparison to the schools with low CTE completion coefficients.

Overall, students at schools with higher CTE completion coefficients seem to participate in the other CTE program studies available instead of a single CTE program study containing most participants. Additionally, such schools also have a larger program availability, and they have larger diversity and more students with IEPs. Thus, their engagement in completing CTE programs also leads to them to having a larger achievement with their ACT scores.

**Table 20: Regression results and other summary statistics by each school zone**

| Zone ID | School Zone | CTE Completion Coefficient | Share of CTE Completers | ACT Score | Share of Students with CCR Diploma | Dual Credit Earned | Share of Non white Students | Share of Female Students | Share of Students who received individualized education | Share of Students who received English language support |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Laughlin | 3.074 | 1.02% | 16.31 | 9.49% | 0 | 59.32% | 49.49% | 14.24% | 8.14% |
| 2 | Sandy Valley | -2.214 | 2.68% | 16.3 | 9.40% | 0.0469 | 57.05% | 46.31% | 13.42% | 21.48% |
| 3 | Liberty | 1.019*** | 4.04% | 17.96 | 7.78% | 0.0385 | 69.41% | 47.51% | 10.08% | 5.02% |
| 4 | Coronado | 0.063 | 3.76% | 21.37 | 27.79% | 0.0252 | 43.82% | 49.25% | 7.26% | 2.37% |
| 5 | Foothill | -0.04 | 2.24% | 18.87 | 15.11% | 0.1430 | 42.45% | 49.32% | 10.83% | 2.17% |
| 6 | **Desert Oasis** | -0.604** | 10.07% | 17.93 | 11.72% | 0.0007 | 68.95% | 47.64% | 8.68% | 5.82% |
| 7 | Silverado | 1.474*** | 5.65% | 17.69 | 10.58% | 0.0004 | 66.82% | 47.99% | 12.13% | 7.98% |
| 8 | **Green Valley** | -0.690*** | 14.75% | 18.96 | 14.20% | 0.0338 | 66.41% | 52.57% | 8.58% | 5.76% |
| 9 | Del Sol | 2.193*** | 1.93% | 15.77 | 13.56% | 0 | 86.26% | 49.37% | 13.40% | 20.78% |
| 10 | Durango | 1.164* | 0.73% | 16.62 | 16.21% | 0.0006 | 80.99% | 46.21% | 10.65% | 13.35% |
| 11 | Boulder City | -0.924 | 2.22% | 19.53 | 10.54% | 0.0309 | 22.55% | 49.72% | 11.18% | 1.29% |
| 12 | **Spring Valley** | -0.690** | 4.65% | 17.83 | 13.69% | 0.0008 | 76.05% | 49.40% | 8.77% | 10.72% |
| 13 | Chaparral | 1.654*** | 1.16% | 14.65 | 3.59% | 0.0015 | 88.67% | 45.82% | 14.25% | 23.70% |
| 14 | Sierra Vista | 0.818*** | 16.08% | 18.98 | 19.49% | 0.0320 | 74.96% | 47.90% | 7.74% | 5.66% |
| 15 | Valley | 1.419*** | 1.74% | 15.55 | 2.38% | 0.0066 | 87.40% | 50.58% | 12.39% | 22.72% |
| 16 | Bonanza | -0.315 | 3.53% | 16.99 | 6.23% | 0.1961 | 80.47% | 48.67% | 11.95% | 16.70% |
| 17 | Las Vegas | 1.826*** | 15.01% | 16.97 | 12.50% | 0.0721 | 91.50% | 51.34% | 7.64% | 18.07% |
| 18 | Ed W. Clark | 1.002** | 3.51% | 18.07 | 8.40% | 0.0004 | 90.14% | 48.04% | 10.05% | 23.22% |
| 19 | El Dorado | 2.801*** | 2.15% | 15.13 | 12.87% | 0.0091 | 91.04% | 42.13% | 12.58% | 25.56% |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 20 | **Western** | 3.874*** | 17.35% | 17.85 | 19.04% | 0.0069 | 89.14% | 47.17% | 9.72% | 19.13% |
| 21 | Rancho | -0.218 | 12.86% | 18.57 | 20.70% | 0.0189 | 81.04% | 56.21% | 6.99% | 15.99% |
| 22 | Desert Pines | 2.477*** | 5.12% | 14.60 | 11.55% | 0.0003 | 96.01% | 47.52% | 13.17% | 28.98% |
| 23 | Palo Verde | 0.331** | 20.81% | 21.21 | 26.48% | 0.0455 | 52.08% | 50.45% | 5.32% | 3.34% |
| 24 | Sunrise Mountain | 2.723*** | 4.06% | 14.47 | 3.06% | 0 | 94.20% | 45.92% | 12.73% | 30.18% |
| 25 | Cimarron-Memorial | 1.993*** | 1.96% | 15.65 | 17.28% | 0 | 83.49% | 44.93% | 12.86% | 14.84% |
| 26 | Canyon Springs | 1.398*** | 1.51% | 15.24 | 3.30% | 0.1254 | 95.11% | 49.91% | 11.94% | 22.13% |
| 27 | Basic | -0.267 | 5.80% | 16.24 | 9.24% | 0.0101 | 66.02% | 48.39% | 14.87% | 9.41% |
| 28 | **Cheyenne** | 2.827*** | 1.74% | 14.74 | 0.63% | 0.0011 | 89.45% | 45.51% | 16.03% | 17.14% |
| 29 | Centennial | 1.112*** | 19.77% | 19.04 | 18.13% | 0.0178 | 64.89% | 50.31% | 7.27% | 4.04% |
| 30 | Mojave | 1.108*** | 3.39% | 14.75 | 6.74% | 0 | 92.73% | 46.77% | 14.86% | 19.93% |
| 31 | Shadow Ridge | 0.725*** | 10.31% | 17.74 | 11.83% | 0.0015 | 58.50% | 48.48% | 10.01% | 4.27% |
| 32 | Legacy | 2.108*** | 3.11% | 15.56 | 3.13% | 0.0002 | 85.70% | 48.39% | 14.25% | 8.35% |
| 33 | Arbor View | 0.786*** | 10.29% | 18.48 | 10.56% | 0.0003 | 52.40% | 49.27% | 9.31% | 2.79% |
| 34 | Virgin Valley | 0.238 | 11.13% | 17.04 | 10.58% | 0.0363 | 57.14% | 49.17% | 12.55% | 15.63% |
| 35 | Indian Springs | -1.415 | 1.38% | 16.61 | 0.69% | 0 | 31.72% | 44.83% | 13.79% | 0.69% |
| 36 | Moapa Valley | -0.0473 | 9.50% | 19.12 | 16.16% | 0.559 | 23.86% | 50.58% | 10.98% | 2.43% |
| 37 | **County** | 3.469*** | 32.00% | 15.80 | 0.07% | 0.0189 | 72.60% | 45.99% | 16.56% | 12.75% |

Results from a quantitative analysis of the Career and Technical Education (CTE) programs in the Clark County School District are presented in this section. The School District is made up of 36 school zones. For this analysis, 168,471 students were pooled from the Clark County School District for the years 2019-2022. Sixty-six CTE programs were used in the analysis.

### Most Salient Points of the Quantitative Analysis of CTE Programs are:

- The average ACT score for the data on all students is 17.42 points with the range from 1 to 36. The average GPA at graduation is 2.739.
- The average dual credits earned per 100 students is 2.74. Note that 165,519 students had zero dual credits. Only 2,886 students reported positive credits that ranged between 1 and 11. For those students, the average dual credits are about 1.6 per student.
- Only 13,652 students (about 8% of total students) completed a CTE program. Out of those that completed CTE, 2,824 students (about 21% of total) completed more than one CTE program.
- About 12% of students have a college and career ready diploma. About 18% have a college and career ready or advanced diploma.
- 10.6% of the students received an individualized education and about 13% needed English language support.

We found significant differences between CTE completers and other students in terms of education outcomes and other demographic indicators. The notable differences are:

- The average ACT score for CTE completers is 21.37 compared to 16.83 for other students.
- The average GPA at graduation for CTE completers is 3.334 compared to 2.625 for other students.
- The average dual credits per 100 students for CTE completers is 8.44 which is almost four times the credits for other students.

- There is also a big difference between the two groups in terms of college and career ready (or advanced) diplomas. 69.4% of CTE completers had college and career ready diplomas compared to only 7.32% of other students.
- CTE completers are also less likely to have received individualized education and in need of English language support. They are also less likely to be nonwhite compared to those that did not complete a CTE program.
- In terms of other school zone control variables, CTE completers are more likely to be from a zone with higher median household income and lower population and housing density.
- The relationship between average ACT score and the estimated effect (regression coefficient) of the CTE program on ACT scores in school zones is estimated. There is a negative correlation between the variables. Those school zones with low average ACT scores tend to have bigger impact from CTE programs. One explanation of this could be because those low-performing school zones have more room to grow and benefit more from the CTE programs.
- There is even a higher positive correlation between average ACT score and the percent share of career and college ready diplomas in the school zones. There is also a similar positive correlation if Advanced Diploma is added to the diploma share variable. Those students who have received career and college ready or advanced diplomas tend to have significantly higher ACT scores.

A regression analysis was completed using the full student dataset from the CCSD with ACT score as the dependent variable and CTE program completion and other indicators used as explanatory variables.

- The results show a consistently positive and statistically significant regression coefficient for CTE completion variable. The estimated coefficient ranges from 0.858 to 2.513. Those students that have completed a CTE program have higher ACT scores by about 0.9-2.5 points.
- Students with college and career ready diplomas have higher ACT scores by about 4.3 to almost 5 points.

- Results show that nonwhite students have significantly lower ACT scores than others but those that have completed a CTE program have done better than those that did not participate in the CTE.
- Female students who have participated in CTE have even lower ACT scores compared to those that did not complete a CTE program.
- CTE completers subsample was used to see if more STEM oriented CTE programs made a difference. Of interest, female students who have participated in the CTE have done better than those that did not.
- Within the CTE completers, students who have received a college and career ready diploma and earned dual credits have significantly higher ACT scores compared to other students.

A separate regression analysis for CTE program completion estimated for each school zone with other student indicators was also completed. Some of the key findings are:

- The school zones with the highest estimated coefficients (indicating greatest association between CTE and ACT score) are for Western, Cheyenne, and those schools that serve students countywide (County).
- The ones with the lowest estimated coefficients are Green Valley, Spring Valley, and Desert Oasis. For those three school zones, the estimated coefficients are negative indicating a negative association between CTE and ACT score. Note that there is a negative relationship between CTE coefficients and ACT scores, which were already pointed out earlier.

## VII. Workforce Gap Analysis

Southern Nevada is expected to face serious workforce development problems in the decade 2020-2030. During that period, according to DETR, the county's labor force will expand from ~926,000 to ~1,134,000 persons, a net change of 208,000. Concurrently, however, almost 500,000 persons will be exiting the workforce (from quits, retirements and out-migrations). Thus over 700,000 new positions will need to be hired and trained during the decade. (Table 21). Additionally, it is expected that about 750,000 persons will be transferring jobs within the workforce during the decade, some fraction of whom will need re-training.

**Table 21: Clark County Workforce Transition 2020-2030 (persons)**

| Topic | at 2020 | at 2030 | Change 2020-2030 | Annual Average |
|---|---|---|---|---|
| Employment | 926,000 | 1,134,000 | 208,000 | 20,800 |
| Exits (moves, quits, retirements) | | | 498,000 | 49,800 |
| Minimum New Openings | | | | **70,600** |

Clark County high schools graduate ~21,000 students[7] each year, barely a third of the county's minimum new openings, even presuming that students and openings were well matched. Overall, Nevada high schools produce ~30,500 graduates[8] annually, roughly a quarter of whom continue to post-secondary education in- and out of state, again resulting in a net supply of ~23,000 new graduate job-seekers statewide annually, insufficient for Clark County alone. NSHE institutions award ~15,000 associate and baccalaureate degrees[9] annually, over half of whom stay in Nevada, contributing another 7,500 persons. Table 22 below quantifies the number of NSHE annually conferred degrees aligned with the in-demand occupations identified by DETR (For a complete

[7] http://nevadareportcard.nv.gov/di/report/summary_4?report=summary_4&scope=e32.y17.y18.y19.y20&organization=c2272&scores=n_Graduate&filterrelation=and&num=20&page=1&pagesize=20&domain=cohort4yr&

[8] http://nevadareportcard.nv.gov/di/report/summary_4?report=summary_4&scope=e32.y17.y18.y19.y20&organization=c2272&scores=n_Graduate&filterrelation=and&num=20&page=1&pagesize=20&domain=cohort4yr&

[9] https://ir.nevada.edu/dashboard.php?d=awards_conferred

list of annual conferred Bachelor's degrees, refer to Appendix 9).[10]The averages pertain to the last three available school years (2019, 2020, and 2021) as well as a combination of both 4-year and 2-year NSHE institutions. All Nevada high schools, colleges, and universities together supply less than half the minimum workforce needs of Clark County for the current decade. The remaining positions – probably most positions, in fact – will be filled by in-migration, bringing with it even more needs for housing, imported goods and services, and public support, including primary education.

Although still not meeting high demands, there are still high averages in the following DETR In-Demand Occupation: Nursing Registered Nurses, Teachers, and Network & Computer Systems Analysts &Administrators. There was a grand total of 3229 awardees for degrees that align with Nursing Registered Nurses, 2553 awardees for Teachers and 2147 awardees for Network & Computer Systems Analysts &Administrators. These totals being at least three times higher than the grand total of the other occupations. In fact, most of the awardees in these occupations are awarded with a Bachelor's degree or above.

[10] https://ir.nevada.edu/strategic_plan_metrics.php?metric=spm4&mid=indemand_occupations

**Table 22: NSHE Conferred Degrees by DETR In-Demand Occupations**

| DETR In-Demand Occupation | Degree Type | 3 Year Average |
|---|---|---|
| Civil Engineering | Bachelor's | 123 |
| | Master's | 38 |
| | Doctoral | 15 |
| | Certificate of Achievement | 0 |
| | Associates | 10 |
| | Skills Certificate | 9 |
| Electrical and Electronics Engineering Technicians | Bachelor's | 7 |
| | Certificate of Achievement | 1 |
| | Associates | 27 |
| Electrical Engineers | Bachelor's | 81 |
| | Master's | 6 |
| | Doctoral | 9 |
| Heating, Air Conditioning, and Refrigeration Mechanics and Installers | Certificate of Achievement | 13 |
| | Associates | 98 |
| | Skills Certificate | 21 |
| Industrial Engineers Technicians | Associates | 15 |
| | Skills Certificate | 54 |
| | Certificate of Achievement | 26 |
| Industrial Machinery Mechanics | Skills Certificate | 15 |
| | Certificate of Achievement | 13 |
| Mechanical Engineers | Bachelor's | 242 |
| | Master's | 12 |
| | Doctoral | 8 |
| Medical & Clinical Laboratory Technologists | Associates | 10 |
| | Bachelor's | 6 |
| | Skills Certificate | 59 |
| Network & Computer Systems Analysts & Administrators | Bachelor's | 210 |
| | Master's | 30 |
| | Doctoral | 2 |
| | Skills Certificate | 442 |
| | Associates | 9 |
| | Certificate of Achievement | 2 |
| Nursing Licensed Practical and Licensed Vocational Nurses | Certificate of Achievement | 7 |

| | | |
|---|---|---|
| Nursing Registered Nurses | Bachelor's | 639 |
| | Master's | 56 |
| | Doctoral | 38 |
| | Associates | 344 |
| Software Developers | Bachelor's | 258 |
| | Master's | 45 |
| | Doctoral | 9 |
| | Associates | 54 |
| | Certificate of Achievement | 23 |
| Teachers | Bachelor's | 433 |
| | Master's | 398 |
| | Doctoral | 20 |

Clearly, it is in Nevada's interest to educate, and re-educate, internally for its own projected growth; doing so will require a more proactive and effective educational system than exists in-state at this time. Of course, workforce and training needs go beyond the gross numbers: jobs vary in both quantity and quality within various classification systems. Throughout this study we use the Bureau of Labor Statistics Standard Occupational Classification system (2018 vintage), generalized to 3-digits, SOC3, also known as Minor Groups[11]. For ease of presentation, Table 23 shows the DETR projected annual openings for Southern Nevada at the coarser SOC2 level, known as Major Groups. Table 7.3 also shows the independent, aspirational estimate of LVGEA, in the same SOC2 groups, specifically for Las Vegas urban core, which represents about 90% of the Southern Nevada economy. Broad agreement is evident in the more professional occupations, but trade and labor classifications, including some paraprofessionals such as health support, are conspicuous by their absence in the LVGEA estimates (starred), which is concerning. DETR estimates are objective, driven by national models, whereas LVGEA estimates are subjective based on local knowledge and targeting higher-wage jobs. Only new positions, excluding exits and transfers, are considered in this comparison.

[11] Several important Minor Groups are accorded 4-digit codes: 15-12 Computer Occupations, 31-31 Home Health Aides, and 56-61 Printing Workers

**Table 23: Estimates of Southern Nevada Workforce Needs, Annually to 2030, New positions**

| SOC | Description | Annual LVGEA Estimate | Annual DETR Estimate |
|---|---|---|---|
| 11 | Management | 5,652 | 3,242 |
| 13 | Business and Finance | 1,542 | 1,620 |
| 15 | Computers and Mathematics | 1,787 | 1,303 |
| 17 | Architecture and Engineering | 897 | 374 |
| 19 | Life and Physical Science | 205 | 149 |
| 21 | Community and Social Science | 0* | 440 |
| 23 | Legal | 388 | 330 |
| 25 | Education and Libraries | 1,493 | 1,987 |
| 27 | Arts, Design, and Entertainment | 340 | 1,410 |
| 29 | Healthcare Practitioners | 2,719 | 2,693 |
| 31 | Healthcare Support | 80* | 3,177 |
| 33 | Protective Services | 169 | 1,463 |
| 35 | Food Preparation and Serving | | 10,068 |
| 37 | Buildings and Grounds Maintenance | 198 | 3,087 |
| 39 | Personal Care | 295 | 4,990 |
| 41 | Sales-related | 212 | 3,642 |
| 43 | Office and Administration | | 3,187 |
| 45 | Farming, Fishing, and Forestry | | 50 |
| 47 | Construction and Extraction | 2,165 | 3,623 |
| 49 | Equipment Installation and Maintenance | 788 | 1,956 |
| 51 | Production [Manufacturing] | 0* | 1,278 |
| 53 | Transportation and Distribution | 688 | 5,576 |
| 55 | Military | | |

## Workforce Gaps

Table 24 reports the LVGEA and DETR workforce estimates described above for the 2020-2030 decade according to CTE Career Cluster categories (1-16) rather than SOC2 codes, so they can be compared to the annualized CCSD high school CTEs completed during the most recent four academic years, 2019-2022.[12] Categories indicated by two as asterisks (**) do not exist in the CTE structure, and are included here only to capture all the LVGEA and DETR estimates,

[12] Here, it is assumed that all CCSD graduates remain in Nevada, which is not necessarily the case.

although not addressed by CTEs. Again, workforce exits and transfers are not considered in this comparison.

**Table 24: Estimates of Clark County Workforce Demands and High School Graduates Supply**

| CC# | Title | DEMAND | | SUPPLY |
|---|---|---|---|---|
| | | Annual LVGEA Estimate | Annual DETR Estimate | Annual CCSD CTEs |
| 1 | Agriculture/Resources | | 50 | 99 |
| 2 | Architecture/Construction | 1543 | 758 | 734 |
| 3 | Arts & Entertainment Tech | 340 | 4152 | 1515 |
| 4 | General Business Mgmt | 4892 | 5705 | 161 |
| 5 | Education & Training | 1493 | 1988 | 624 |
| 6 | Finance | 155 | 458 | 49 |
| 7 | Government | 0 | 0 | 1 |
| 8 | Health Sciences | 2799 | 5870 | 1412 |
| 9 | Hospitality / Tourism | 198 | 10272 | 1486 |
| 10 | Human Services | 295 | 2726 | 261 |
| 11 | Information Technology | 1765 | 1261 | 808 |
| 12 | Law & Safety | 626 | 1844 | 886 |
| 13 | Manufacturing | 482 | 2990 | 331 |
| 14 | Marketing [incl. Sales] | 2361 | 3892 | 339 |
| 15 | STEM Fields | 158 | 141 | 298 |
| 16 | Transportation / Distribution | 688 | 6094 | 556 |
| ** | Trades & Maintenance | 1807 | 6330 | N/A |
| ** | Office Clerical | | 1121 | N/A |
| | Totals | 19602 | 55652 | 10561 |

Immediately evident is the three-fold difference in total estimate of workforce needs between LVGEA, which targets white-collar jobs, and DETR, which includes blue- and pink-collar jobs as well. Closer examination suggests a radically alternate understanding of the Las Vegas metro economy regarding its Hospitality & Tourism and Transportation & Distribution clusters. Regardless, CCSD is not producing CTEs that engage with those fields, which have generally been characterized by low wages and limited futures.

Perhaps more striking is the ten-fold deficiency of CCSD graduates with CTE credentials in the good-paying high-demand fields where LVGEA and DETR basically agree. In all clusters,

except Agriculture and STEM, CTE completions barely scratch the surface of Southern Nevada's workforce needs.

### Most Salient Points for the Workforce Gap Analysis are:

- Based on both official DETR figures as well as those offered by the LVGEA, Southern Nevada's most obvious high-demand, high-paying jobs fall within three CTE career clusters: Education & Training, Health Science, and Information Technology.
- Jobs in the Science, Technology, Engineering & Math (STEM) career cluster are high-paying but much less abundant.
- Conversely, the Hospitality & Tourism career cluster, which includes food service, gaming, and hotel management, is an important sector of long-standing and high employment in Nevada; but suffers from relatively low wages and recurrent booms-and-bust cycles, as well as being subject to increasing automation.
- Similarly, the Transportation, Distribution & Logistics career cluster, which includes warehousing and shipping, also long-established in Nevada, provides somewhat better wages but no particular future.

## VIII. Economic Diversification in Southern Nevada and Determining the Impact of Digital Technology on Occupations

We have discussed in the introduction that Nevada is one of the least diversified states in the U.S. and the least diversified in its neighboring region. It is important to note also that Southern Nevada is less diversified economically compared to a number of other Nevada counties. Table 25 summarizes the industry diversity index as computed by EMSIkb (2022).[13] It shows the industry Diversity Index for counties in the state of Nevada. The Nevada county with the highest Industry Diversity Index is Washoe County. This index is high for Washoe County due its efforts in diversification and the Reno-Tahoe Industrial Park. Clark County ranks fifth among Nevada's counties as to the Industry Diversity Index and Clark County has approximately 72% of the state's population. Being somewhat diversified and a large population base makes efforts for diversifying Clark County occupations difficult. Among the three Nevada counties with Industry Diversity Index below one, Lander County (0.8), Esmeralda County (0.5), and Eureka County (0.0) have low diversity scores because of their dependence upon the mining and agricultural sector.

[13] The referenced paper by EMSIkb (2022) outlines procedures for estimating industry diversification. The index has a minimum value of zero when all economic activity is within one economic sector, and the value increases as the number of economic sectors and distribution of economic activity across these economic sectors becomes more equal.

**Table 25: Industry Diversity Index Scores for Counties in the State of Nevada, 2022.**

| Counties | Industry Diversity Index | Rank |
|---|---|---|
| Washoe | 85.6 | 1 |
| Churchill | 65.2 | 2 |
| Lyon | 62.7 | 3 |
| Carson City | 56.5 | 4 |
| Clark | 45.9 | 5 |
| Nye | 41.4 | 6 |
| Elko | 40.0 | 7 |
| Douglas | 34.4 | 8 |
| Lincoln | 33.4 | 9 |
| Mineral | 20.2 | 10 |
| Humboldt | 15.2 | 11 |
| White Pine | 11.6 | 12 |
| Pershing | 3.4 | 13 |
| Storey | 1.1 | 14 |
| Lander | 0.8 | 15 |
| Esmeralda | 0.5 | 16 |
| Eureka | 0.0 | 17 |

Source: EMSI data presented by the Nevada Governor's Office of Economic Development (GOED).

Southern Nevada's workforce demands are minimally supported by the high school graduate supply. Exacerbating the deficient workforce pipeline that currently exists in Southern Nevada is the looming impact of digital technology on current occupations. This section of the report investigates the potential impacts of new digital technologies on the 100 occupations[14] targeted by the Las Vegas Global Economic Alliance (LVGEA). This section will follow past studies by Fossen and Sorgner (2019). Fossen and Sorgner (2019) argue that impacts of digitalization of the labor force will be destructive and transformative. Destructive effects of digitalization seek to substitute human labor while transformative effects complement labor. In the article by Fossen

[14] State of Nevada Department of Employment, Training, and Rehabilitation projected 80 occupations of the 100 outlined by LVGEA.

and Sorgner (2019), the authors develop four broad categories to characterize the effects of digitalization on the Southern Nevada economy. These four broad categories are:

1. DIGITAL RISING STARS: These are occupations where transformation has a high impact, but these occupations do not lead to replacement or risk of destruction is low. People in this risk category will need to have an ability to adjust to rapid changes in their occupation. They may need to acquire further qualifications in such occupations. In their paper, occupations such as Airline Pilots, Physicists, and Surgeons are examples.
2. DIGITAL MACHINE TERRAIN: These occupations are characterized as highly transformative and destructive impacts. These occupations have double high impact and are characterized as occupations that could make human work obsolete. Their examples are Heavy and Tractor-Trailer Truck Drivers, Executive Secretaries and Executive Administration Assistants, and Accountants and Auditors.
3. DIGITAL HUMAN TERRAIN: These occupations are rather unlikely to be replaced by machines because of a low destructive effect but also a low transformative influence. People in these occupations possess skills that currently cannot be performed by machines and there is little need for human-machine interactions. These occupations have non-routine tasks and perform in an unstructured environment. Occupation examples are Customer Service Representatives, Janitors and Cleaners, Maids and Housekeeping, and Teacher Assistants.
4. DIGITAL COLLAPSING OCCUPATIONS: These occupations face a high risk of destruction in which there is little need for human skill. These occupations may in the future be fully automated without any transformation. Examples are Retail Salespersons, Cashiers, and Telemarketers.

Not all occupations in the 100 LVGEA had destruction and transformative scores, but the below tables are for the 66 that had scores.

Table 26 shows the Digital Rising Star occupations, of which there are thirty. Recall these occupations have low probability of being replaced but do have a high degree of transformation.

These occupations are in the medical, computer, and engineering field, and they must have continuous training to employ the latest computer and digital techniques. These occupations are critical to Nevada's new economy.

**Table 26: Digital Rising Star Occupations of the 100 Targeted Occupations, 2030**

| Occupation | Employment 2030 | Location Quotient 2030 |
|---|---|---|
| Commercial Pilots | 817 | 2.43 |
| Construction Managers | 7492 | 1.93 |
| Architectural and Civil Drafters | 1114 | 1.45 |
| First-Line Supervisors of Construction Trades and Extraction Workers | 8641 | 1.38 |
| Pharmacists | 3241 | 1.26 |
| Computer User Support Specialists | 7049 | 1.16 |
| Civil Engineers | 3509 | 1.09 |
| Sales Managers | 3800 | 1.06 |
| Environmental Engineers | 551 | 1.05 |
| First-Line Supervisors of Mechanics, Installers, and Repairers | 4963 | 1.03 |
| Financial Managers | 7015 | 1.01 |
| Lawyers | 6633 | 0.98 |
| First-Line Supervisors of Non-Retail Sales Workers | 2702 | 0.96 |
| General and Operations Managers | 24974 | 0.95 |
| Compliance Officers | 2917 | 0.91 |
| Dieticians and Nutritionists | 592 | 0.86 |
| Graphic Designers | 1738 | 0.85 |
| Purchasing Managers | 431 | 0.82 |
| Marketing Managers | 2021 | 0.82 |
| Human Resources Managers | 1140 | 0.75 |
| Architectural and Engineering Managers | 1061 | 0.62 |
| Network and Computer Systems Administrators | 1564 | 0.62 |
| Computer Network Architects | 638 | 0.49 |
| Computer Systems Analysts | 2130 | 0.47 |
| Electrical Engineers | 704 | 0.42 |
| Mechanical Engineers | 1079 | 0.38 |
| Logisticians | 923 | 0.37 |
| Architects, Except Landscape and Naval | 395 | 0.31 |
| Operations Research Analysts | 307 | 0.24 |
| Medical Scientists, Except Epidemiologists | 242 | 0.16 |

Table 27 shows the Machine Terrain occupations of which there are five. Recall these occupations have the double impact of being highly destructive and transformation impacts. Many of these occupations in Table 8.3 are technicians can be digitized.

**Table 27: Machine Terrain Occupations of the 100 Targeted Occupations, 2030**

| Occupation | Employment 2030 | Location Quotient 2030 |
|---|---|---|
| Electrical and Electronic Engineering Technicians | 1553 | 1.7 |
| Computer Network Support Specialists | 1869 | 1.45 |
| Civil Engineering Technologists and Technicians | 884 | 1.42 |
| Cost Estimators | 2249 | 1.41 |
| Management Analysts | 6818 | 0.73 |

Table 28 shows the Human Terrain occupations of which there are twenty-four. These occupations are rather unlikely to be replaced by machines because of a low destructive effect but also a low transformative influence. People in these occupations possess skills that currently cannot be performed by machines and there is little need for human-machine interactions. Occupations in this category are in the medical and education field where human interaction is important. All education levels, primary, middle, and high school are human terrain occupations.

**Table 28: Human Terrain Occupations of the 100 Targeted Occupations, 2030**

| Occupation | Employment 2030 | Location Quotient 2030 |
|---|---|---|
| Respiratory Therapists | 2173 | 1.93 |
| Electricians | 9779 | 1.69 |
| Plumbers, Pipefitters, and Steamfitters | 6024 | 1.63 |
| Registered Nurses | 29627 | 1.13 |
| Elementary School Teachers, Except Special Education | 11925 | 1.1 |
| Physical Therapists | 2304 | 1.06 |
| Occupational Therapists | 1167 | 1.04 |
| Training and Development Specialists | 3235 | 1.04 |
| Middle School Teachers, Except Special and Career/Technical Education | 4629 | 1.04 |
| Environmental Engineering Technologists and Technicians | 273 | 1.01 |
| Transportation, Storage, and Distribution Managers | 1358 | 0.98 |
| Speech-Language Pathologists | 1392 | 0.88 |
| Veterinarians | 714 | 0.87 |
| Secondary School Teachers, Except Special and Career/Technical Education | 7022 | 0.87 |
| Dentists, General | 956 | 0.85 |
| Medical and Health Services Managers | 4116 | 0.84 |
| Licensed Practical and Licensed Vocational Nurses | 3886 | 0.78 |
| Physical Therapists Assistants | 771 | 0.77 |
| First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers | 1648 | 0.73 |
| Electronics Engineering, Except Computer | 758 | 0.7 |
| Radiologic Technologists and Technicians | 1502 | 0.68 |
| Veterinary Technologists and Technicians | 793 | 0.6 |
| Computer and Information Systems Manager | 2417 | 0.53 |
| Natural Sciences Managers | 387 | 0.25 |
| Chemists | 432 | 0.25 |

Table 29 shows the Collapsing occupations in which there are seven. These occupations are faced with high destruction and their activities may be replaced by machines. The occupation designated by market research we have already seen in computerized consumer questioning. These occupations may be completely different in their activities in the future. There are seven occupations designated as collapsing.

**Table 29: Collapsing Occupations of the 100 Targeted Occupations, 2030**

| Occupation | Employment 2030 | Location Quotient 2030 |
|---|---|---|
| Environmental Science and Protection Technicians, Including Health | 499 | 2.07 |
| Market Research Analysts and Marketing Specialists | 4698 | 0.67 |
| Diagnostic Medical Sonographers | 465 | 0.6 |
| Surveyors | 526 | 1.11 |
| Surgical Technologists | 1349 | 1.56 |
| Installation, Maintenance, and Repair Workers, All Other | 2476 | 1.61 |

This section of the report analyzes the potential effects of the new wave of digitalization on occupations. While transformative digitalization changes the content of occupations without necessarily replacing human workers, destructive digitalization may make workers obsolete. Recognition of occupations requiring continuous training and those that may become obsolete is data needed for a more encompassing occupational development strategy.

## Most Salient Points of Occupation Analysis of Economic Diversification in Southern Nevada and the Impact of Digital Technology.

- Southern Nevada's workforce demands are minimally supported by the high school graduate supply. Exacerbating the deficient workforce pipeline that currently exists in Southern Nevada is the looming impact of digital technology on current occupations.
- Impacts of digitalization of the labor force will be destructive and transformative. Destructive effects of digitalization seek to substitute human labor while transformative effects complement labor. Potential impacts of new digital technologies on the 100 occupations are Digital Rising Stars, Digital Machine Terrain, Digital Human Terrain, and Digital Collapsing occupations.
- Digital Rising Stars are occupations where transformation has a high impact, but these occupations do not lead to replacement or risk of destruction is low. Medical, computer, and engineering field occupations are examples of Digital Rising Star occupations. In the future, these occupations must have continuous training to employ the latest digital techniques, as they are critical to Nevada's new economy.

- Machine Terrain occupations have the double impact of being highly destructive and transformative. Engineering technicians, management analyst, and cost estimators whose jobs can be digitized are examples of Machine Terrain occupations.
- Human Terrain occupations are rather unlikely to be replaced by machines because of a low destructive effect but also a low transformative influence. Employees in these occupations possess skills that currently cannot be performed by machines and there is little need for human-machine interactions. Medical, and education occupations are examples of Human Terrain occupations. All education levels, primary, middle, and high school are human terrain occupations.
- Collapsing occupations are faced with high destruction and their activities may be replaced by machines. These occupations may be completely different in their activities and skills in the future. Surveyors; Installation, Maintenance, and Repair Workers; and Market Research Analyst and Marketing Specialists are examples of Collapsing occupations.

## IX. Concluding Remarks

Nevada is one of the least economically diversified states in the United States, and Southern Nevada is one of the least economically diverse counties in the state. In order to diversify Southern Nevada's economy, we must diversify the workforce pipeline. Nevada cannot continue with the status quo, investing in fragmented components of the workforce pipeline and waiting for change. Our state must purposefully and systematically align workforce, K-16 education, and economic development in order to grow our state.

Workforce development and public education play an integral role in the economic development and diversification of the state. In essence, public education and workforce development are the *foundation* for economic development and diversification. Hence, we focused largely on the workforce pipeline that must begin with the public education system.

As detailed in this report, Nevada's K-16 workforce pipeline is insufficient in meeting Southern Nevada's occupational needs. In order to meet the future workforce needs, we propose three urgent recommendations:

**Recommendation 1:** *Prioritize Nevada's K-16 to workforce pipelines to diversify and strengthen Southern Nevada's economic development.*

Nevada, particularly Southern Nevada, lags behind in economic diversification, and the lack of diversity is largely due to reliance on the leisure and hospitality sector. Nevada's workforce pipeline is fragmented. Nevada has components of the pipeline (e.g., dual enrollment programs; apprenticeships), but each component does not impact the pipeline sufficiently to prepare our workforce.

**Recommendation 2:** *Assign one central agency to support K-16 to workforce pipelines that will manage coordination between governmental agencies and ensure workforce outcomes align with economic development needs.*

Nevada has had a decentralized economic and workforce development system which has caused fragmentation in efforts and insufficiency in outcomes. This study, particularly the asset map in Phase 1, showed a variety of organizations that are active in workforce issues, but it is not clear if or how these actors work together. One central agency will align resources, ensure accountability within and between governmental agencies, and make certain outcomes align with Nevada's economic development needs.

**Recommendation 3:** *Expansion of successful K-16 career pathway programs to all Nevada's students, regardless of economic and geographic location.*

CTE programs have been offered across CCSD schools but achievement outcomes, program quality, and alignment to high-demand, high-pay occupations across different school zones and demographic groups has been uneven, as shown by the qualitative and quantitative analysis in this report. Successful career pathway programs are those which result in high academic outcomes and include an alignment of CTE programs and dual enrollment credits with in-demand occupations, and they exist within Southern Nevada.

Utilizing successful career pathway programs to expand offerings across Nevada will result in students entering post-secondary and workforce with the knowledge and skills needed to build a diverse workforce and economy.

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# Appendix

## Appendix I: Source Datasets

With the exception of CCSD's geographic data, all of the sources' datasets were accessible in Excel. Accordingly, Excel-based procedures (VBA-enabled Excel workbooks) were written to prepare the data for further statistical analyses.

| Procedure | Description |
|---|---|
| ATT-Prep | Splits the CCSD Annual student list into three primary components: Schools, Students, and Transcripts, i.e. School-Year-Student performance |
| CTE-Prep | Cross-tabulates the Transcript data [after ATT-Prep] into a matrix of CTE involvement by high schools (rows) and CTE programs (columns) for each year |
| BGZ-Prep | Interpolates the demographic and socio-economic data from Census block-groups to CCSD attendance zones, based on spatial intersection of block-groups and zones geographies (performed separately in Esri ArcGIS software) |

The data as prepared above were subsequently loaded into an MS Access database, both to organize them in a single datafile, and to facilitate extracting portions of them via SQL queries for analysis and reporting. The two principal queries are 'Student-Demogs' and 'Transcript-Demogs', which return into Excel worksheets either Student or Transcript data, respectively, connected to the Demographics of the surrounding school attendance zone.

### Hachman Index

The Hachman Index is calculated as the inverse of the weighted sum of the location quotients, by industry for each analysis county, across all industries. A location quotient (LQ) is the fraction of a county's employment in a particular industry divided by the fraction of the reference areas, in this case U.S., employment in the same industry. The LQs are weighted by the share of the county's employment in a particular industry. Counties with a large share of employment in only a few key industries, which differ substantially from the share of employment for those industries nationwide, will have a relatively large weighted sum of LQs and subsequently a relatively low Hachman Index value (since it is the inverse of the weighted LQs). Conversely, counties which more closely reflect national employment distribution will have relatively small

weighted LQs and a relatively high Hachman Index value. The Hachman Index for a given period of time is calculated as:

$$HI = \frac{1}{(\sum_i \left(\frac{E_{Si}}{E_{Ri}}\right) x(E_{Si}))}$$

Where $E_{Si}$ is the share of the subject area employment in industry I, and $E_{Ri}$ is the share of the reference region employment in industry i.

## Appendix 2: Annual Count for Dual Enrollment Credits Earned by School

| DETR In-Demand Occupation | Degree Type | School Year | Total Graduates |
|---|---|---|---|
| Civil Engineering | Bachelor's | 2019 | 112 |
| | Master's | | 39 |
| | Doctoral | | 13 |
| | Certificate of Achievement | | 1 |
| | Associates | | 16 |
| | Skills Certificate | | 11 |
| Electrical and Electronics Engineering Technicians | Bachelor's | 2019 | 5 |
| | Certificate of Achievement | | 1 |
| | Associates | | 37 |
| Electrical Engineers | Bachelor's | 2019 | 71 |
| | Master's | | 10 |
| | Doctoral | | 7 |
| Heating, Air Conditioning, and Refrigeration Mechanics and Installers | Certificate of Achievement | 2019 | 18 |
| | Associates | | 17 |
| | Skills Certificate | | 20 |
| Industrial Engineers Technicians | Associates | 2019 | 25 |
| | Skills Certificate | | 71 |
| | Certificate of Achievement | | 4 |
| Industrial Machinery Mechanics | Skills Certificate | 2019 | 19 |
| | Certificate of Achievement | | 17 |
| Mechanical Engineers | Bachelor's | 2019 | 232 |
| | Master's | | 13 |
| | Doctoral | | 8 |
| Medical & Clinical Laboratory Technologists | Associates | 2019 | 9 |
| | Bachelor's | | 7 |
| | Skills Certificate | | 82 |
| Network & Computer Systems Analysts & Administrators | Bachelor's | 2019 | 189 |
| | Master's | | 32 |
| | Doctoral | | 2 |

| | | | |
|---|---|---|---|
| | Skills Certificate | | 376 |
| | Associates | | 14 |
| | Certificate of Achievement | | 1 |
| Nursing Registered Nurses | Bachelor's | 2019 | 552 |
| | Master's | | 39 |
| | Doctoral | | 28 |
| | Associates | | 345 |
| Software Developers | Bachelor's | 2019 | 220 |
| | Master's | | 43 |
| | Doctoral | | 9 |
| | Associates | | 48 |
| | Certificate of Achievement | | 1 |
| Teachers | Bachelor's | 2019 | 369 |
| | Master's | | 381 |
| | Doctoral | | 18 |
| Civil Engineering | Bachelor's | 2020 | 134 |
| | Master's | | 34 |
| | Doctoral | | 17 |
| | Associates | | 7 |
| | Skills Certificate | | 5 |
| Electrical and Electronics Engineering Technicians | Bachelor's | 2020 | 8 |
| | Certificate of Achievement | | 1 |
| | Associates | | 3 |
| Electrical Engineers | Bachelor's | 2020 | 83 |
| | Master's | | 2 |
| | Doctoral | | 9 |
| Heating, Air Conditioning, and Refrigeration Mechanics and Installers | Certificate of Achievement | 2020 | 8 |
| | Associates | | 24 |
| | Skills Certificate | | 21 |
| Industrial Engineers Technicians | Certificate of Achievement | 2020 | 4 |
| | Associates | | 21 |
| | Skills Certificate | | 69 |
| Industrial Machinery Mechanics | Skills Certificate | 2020 | 15 |

| | | | |
|---|---|---|---|
| | Certificate of Achievement | | 15 |
| Mechanical Engineers | Bachelor's | 2020 | 244 |
| | Master's | | 9 |
| | Doctoral | | 10 |
| Medical & Clinical Laboratory Technologists | Associates | 2020 | 9 |
| | Bachelor's | | 5 |
| | Skills Certificate | | 59 |
| Network & Computer Systems Analysts & Administrators | Bachelor's | 2020 | 229 |
| | Master's | | 32 |
| | Doctoral | | 5 |
| | Skills Certificate | | 510 |
| | Certificate of Achievement | | 4 |
| | Associates | | 28 |
| Nursing Licensed Practical and Licensed Vocational Nurses | Certificate of Achievement | 2020 | 5 |
| Nursing Registered Nurses | Bachelor's | 2020 | 630 |
| | Master's | | 59 |
| | Doctoral | | 39 |
| | Associates | | 335 |
| Software Developers | Bachelor's | 2020 | 271 |
| | Master's | | 42 |
| | Doctoral | | 13 |
| | Associates | | 110 |
| Teachers | Bachelor's | 2020 | 468 |
| | Master's | | 446 |
| | Doctoral | | 21 |
| Civil Engineering | Bachelor's | 2021 | 123 |
| | Master's | | 40 |
| | Doctoral | | 15 |
| | Associates | | 8 |
| | Skills Certificate | | 10 |
| Electrical and Electronics Engineering Technicians | Bachelor's | 2021 | 8 |
| | Certificate of Achievement | | 1 |
| | Associates | | 41 |

| | | | |
|---|---|---|---|
| Electrical Engineers | Bachelor's | 2021 | 88 |
| | Master's | | 7 |
| | Doctoral | | 10 |
| Heating, Air Conditioning, and Refrigeration Mechanics and Installers | Certificate of Achievement | 2021 | 13 |
| | Associates | | 253 |
| | Skills Certificate | | 21 |
| Industrial Engineers Technicians | Associates | 2021 | 16 |
| | Skills Certificate | | 69 |
| | Certificate of Achievement | | 4 |
| Industrial Machinery Mechanics | Skills Certificate | 2021 | 11 |
| | Certificate of Achievement | | 7 |
| Mechanical Engineers | Bachelor's | 2021 | 250 |
| | Master's | | 14 |
| | Doctoral | | 6 |
| Medical & Clinical Laboratory Technologists | Associates | 2021 | 12 |
| | Bachelor's | | 6 |
| | Skills Certificate | | 36 |
| Network & Computer Systems Analysts & Administrators | Bachelor's | 2021 | 211 |
| | Master's | | 27 |
| | Skills Certificate | | 439 |
| | Certificate of Achievement | | 10 |
| | Associates | | 38 |
| Nursing Licensed Practical and Licensed Vocational Nurses | Certificate of Achievement | 2021 | 16 |
| Nursing Registered Nurses | Bachelor's | 2021 | 734 |
| | Master's | | 69 |
| | Doctoral | | 47 |
| | Associates | | 352 |
| Software Developers | Bachelor's | 2021 | 283 |
| | Master's | | 50 |
| | Doctoral | | 6 |
| | Certificate of Achievement | | 3 |
| | Associates | | 68 |

| | | | |
|---|---|---|---|
| Teachers | Bachelor's | 2021 | 462 |
| | Master's | | 366 |
| | Doctoral | | 22 |

## Appendix 3: Average ACT Composite Scores by School

| School Name | SY1819 | SY1920 | SY2021 | SY2122 |
|---|---|---|---|---|
| A-Tech | 23.48 | 24.97 | 24.12 | 23.88 |
| Arbor View HS | 18.43 | 18.57 | 18.14 | 18.17 |
| Basic Academy of International Studies | 16.70 | 16.50 | 15.86 | 15.56 |
| Bonanza HS | 15.80 | 15.49 | 14.94 | 14.90 |
| Boulder City HS | 20.17 | 19.73 | 17.91 | 19.30 |
| Canyon Springs HS | 15.06 | 14.88 | 14.76 | 14.76 |
| Centennial HS | 17.78 | 17.62 | 17.09 | 16.60 |
| Chaparral HS | 14.60 | 14.82 | 14.07 | 14.06 |
| Cheyenne HS | 15.11 | 14.82 | 14.31 | 13.85 |
| Cimarron-Memorial HS | 15.60 | 16.07 | 15.10 | 15.29 |
| Clark HS | 18.33 | 18.42 | 17.45 | 18.04 |
| CSN HS East | 21.14 | 21.23 | 20.41 | 19.05 |
| CSN HS South | 24.90 | 23.92 | 23.41 | 24.63 |
| CSN HS West | 24.19 | 24.71 | 23.11 | 23.86 |
| Coronado HS | 21.60 | 21.85 | 21.02 | 20.55 |
| Del Sol Academy of the Performing Arts | 16.22 | 15.48 | 15.72 | 15.46 |
| Desert Oasis HS | 17.59 | 18.42 | 17.94 | 17.16 |
| Desert Pines HS | 14.78 | 14.86 | 14.57 | 14.32 |
| Desert Rose HS | 12.58 | 13.44 | 12.00 | 12.55 |
| Durango HS | 17.16 | 16.62 | 15.86 | 15.95 |
| East CTA | 19.58 | 18.91 | 17.69 | 18.56 |
| Eldorado HS | 15.57 | 15.16 | 14.65 | 14.73 |
| Foothill HS | 18.22 | 18.73 | 17.30 | 18.20 |
| Global Community HS | 13.12 | 12.58 | 12.71 | 12.00 |
| Green Valley HS | 19.42 | 19.11 | 18.77 | 17.79 |
| Indian Springs HS | 17.33 | 15.57 | 15.74 | 17.82 |
| Las Vegas Academy of the Arts | 22.53 | 22.55 | 21.09 | 20.89 |
| Las Vegas HS | 15.58 | 15.81 | 15.66 | 15.14 |
| Laughlin MS/HS | 17.07 | 16.35 | 15.36 | 16.00 |
| Legacy HS | 15.43 | 15.63 | 15.25 | 15.16 |
| Liberty HS | 18.45 | 18.32 | 17.51 | 17.71 |
| Mission High School | 14.53 | 15.17 | 13.60 | 13.25 |
| Moapa Valley HS | 19.28 | 18.98 | 18.19 | 19.36 |
| Mojave HS | 15.03 | 15.31 | 14.40 | 14.16 |
| Nevada Learning Academy at CCSD | 20.39 | 20.25 | 19.79 | 15.38 |
| Northwest CTA | 22.14 | 22.10 | 20.41 | 20.50 |
| Palo Verde HS | 20.61 | 20.48 | 19.70 | 19.40 |
| Rancho HS | 17.16 | 17.30 | 16.64 | 15.99 |

| | | | | |
|---|---|---|---|---|
| Sandy Valley JR/SR | 15.94 | 15.47 | 17.43 | 16.63 |
| Shadow Ridge HS | 17.89 | 17.89 | 17.47 | 17.39 |
| Sierra Vista HS | 17.56 | 17.88 | 17.28 | 17.44 |
| Silverado HS | 18.08 | 17.64 | 17.87 | 16.71 |
| Southeast CTA | 19.50 | 19.49 | 19.23 | 18.62 |
| Southwest CTA | 21.27 | 21.50 | 21.09 | 21.33 |
| Spring Valley HS | 18.12 | 18.24 | 17.81 | 17.50 |
| Sunrise Mountain HS | 14.45 | 14.66 | 14.18 | 14.52 |
| Valley HS | 15.18 | 15.34 | 15.07 | 14.70 |
| Veterans Tribute CTA | 20.87 | 20.88 | 19.35 | 19.47 |
| Virgin Valley HS | 17.55 | 17.21 | 16.63 | 16.57 |
| West Career and Tech Academy | 23.80 | 24.08 | 22.78 | 22.40 |
| West Prep HS | 15.76 | 17.00 | 16.12 | 16.18 |
| Western HS | 14.50 | 14.57 | 13.99 | 13.99 |

## Appendix 4: Career & Technical Education (CTE) Programs Used in the Clark County School District

| Career and Technical Education Programs of Study |
|---|
| Accounting & Finance |
| Administrative Services |
| Aerospace Engineering* |
| Agricultural Mechanics Technology* |
| Agriculture Leadership, Communication & Policy |
| Animation* |
| Architectural & Civil Engineering* |
| Architectural Design |
| Automotive Service Technician* |
| Automotive Technology* |
| Aviation Maintenance Technician* |
| Aviation Technology* |
| Baking & Pastry |
| Biomedical* |
| Business Management |
| Community Health Science* |
| Computer Science* |
| Construction Technology* |
| Cosmetology |
| Criminal Justice |
| Culinary Arts |
| Cybersecurity* |
| Dental Science* |
| Diesel Technology* |
| Digital Game Development* |
| Drafting & Design |
| Early Childhood Education |
| Electronic Technology* |
| Emergency Medical Technician* |
| Emergency Telecommunications* |
| Entrepreneurship |
| Environmental Management |
| Fashion, Textiles & Design |
| Fire Science* |
| Floriculture Design & Management |
| Food Science Technology* |

| |
|---|
| Foods & Nutrition |
| Forensic Science* |
| Furniture & Cabinetmaking |
| Graphic Design |
| Health Information Management<br>High School of Business |
| Hospitality & Tourism |
| IT Networking* |
| IT Service & Support* |
| Interior Design |
| Landscape Design & Management |
| Law Enforcement |
| Manufacturing Technologies* |
| Marketing |
| Mechanical Engineering* |
| Mechanical Technology* |
| Medical Assisting |
| Military Science* |
| Nursing Assistant |
| Pharmacy Practice |
| Photography |
| Radio Production* |
| Respiratory Science* |
| Sports & Entertainment Marketing |
| Sports Medicine* |
| Teaching and Training |
| Theatre Technology* |
| Video Production* |
| Web Design & Development* |
| Welding Technology* |

* indicates CTE program with STEM orientation.

## Appendix 5: CCSD Dual Enrollment Credit Outcomes

| High School Name | Grad. Year | Total Grads | Total with Dual Enroll Credits | Grads with Dual Enroll Credits | Total NSHE Units Enrolled | Total NSHE Units Earned | Average NSHE Units Earned by Graduates |
|---|---|---|---|---|---|---|---|
| Adult Ed | 2019 | 18 | 5 | 28% | 99 | 51 | 10.20 |
| | 2020 | 16 | 5 | 31% | 11 | 11 | 2.20 |
| Advanced Technologies Academy | 2019 | 242 | 100 | 41% | 720 | 717 | 7.17 |
| | 2020 | 277 | 137 | 49% | 1048 | 1018 | 7.43 |
| Arbor View High School | 2019 | 719 | 40 | 6% | 228 | 228 | 5.70 |
| | 2020 | 728 | 26 | 4% | 212 | 191 | 7.35 |
| Basic Academy Of International Studies | 2019 | 530 | 44 | 8% | 443 | 401 | 9.11 |
| | 2020 | 491 | 67 | 14% | 500 | 440 | 6.57 |
| Bonanza High School | 2019 | 484 | 10 | 2% | 81 | 72 | 7.20 |
| | 2020 | 435 | 12 | 3% | 159 | 135 | 11.25 |
| Boulder City High School | 2019 | 121 | 37 | 31% | 288 | 266 | 7.19 |
| | 2020 | 131 | 37 | 28% | 225 | 225 | 6.08 |
| Canyon Springs High School | 2019 | 573 | 16 | 3% | 128 | 116 | 7.25 |
| | 2020 | 521 | 29 | 6% | 216 | 189 | 6.52 |
| Centennial High School | 2019 | 666 | 25 | 4% | 313 | 289 | 11.56 |
| | 2020 | 665 | 29 | 4% | 275 | 240 | 8.28 |
| Chaparral High School | 2019 | 488 | 17 | 3% | 115 | 94 | 5.53 |
| | 2020 | 458 | 11 | 2% | 141 | 106 | 9.64 |
| Cheyenne High School | 2019 | 422 | 16 | 4% | 167 | 142 | 8.88 |
| | 2020 | 414 | 49 | 12% | 453 | 400 | 8.16 |
| Cimarron-Memorial High School | 2019 | 535 | 7 | 1% | 64 | 58 | 8.29 |
| | 2020 | 617 | 35 | 6% | 261 | 206 | 5.89 |
| Clark High School | 2019 | 737 | 66 | 9% | 480 | 459 | 6.95 |
| | 2020 | 642 | 53 | 8% | 377 | 344 | 6.49 |
| Coronado High School | 2019 | 766 | 136 | 18% | 1033 | 1001 | 7.36 |
| | 2020 | 789 | 184 | 23% | 1430 | 1406 | 7.64 |
| CSN High School East-Cheyenne | 2019 | 93 | 87 | 94% | 3972 | 3742 | 43.01 |
| | 2020 | 60 | 57 | 95% | 2603 | 2501 | 43.88 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CSN High School South-Henderson | 2019 | 86 | 82 | 95% | 3956 | 3863 | 47.11 |
| | 2020 | 67 | 65 | 97% | 3148 | 3077 | 47.34 |
| CSN High School West-Charleston | 2019 | 104 | 103 | 99% | 5463 | 5303 | 51.49 |
| | 2020 | 73 | 73 | 100% | 3919 | 3815 | 52.26 |
| Del Sol High School | 2019 | 516 | 7 | 1% | 40 | 21 | 3.00 |
| | 2020 | 465 | 31 | 7% | 188 | 173 | 5.58 |
| Desert Oasis High School | 2019 | 686 | 28 | 4% | 332 | 294 | 10.50 |
| | 2020 | 712 | 60 | 8% | 595 | 532 | 8.87 |
| Desert Pines High School | 2019 | 542 | 5 | 1% | 61 | 33 | 6.60 |
| | 2020 | 614 | 44 | 7% | 350 | 268 | 6.09 |
| Desert Rose High School | 2019 | 136 | 10 | 7% | 120 | 78 | 7.80 |
| | 2020 | 60 | 5 | 8% | 40 | 30 | 6.00 |
| Durango High School | 2019 | 495 | 5 | 1% | 19 | 10 | 2.00 |
| | 2020 | 494 | 71 | 14% | 474 | 465 | 6.55 |
| East Career and Technical Academy | 2019 | 391 | 210 | 54% | 2016 | 2007 | 9.56 |
| | 2020 | 425 | 300 | 71% | 4967 | 4922 | 16.41 |
| Eldorado High School | 2019 | 477 | 50 | 10% | 337 | 304 | 6.08 |
| | 2020 | 472 | 20 | 4% | 155 | 118 | 5.90 |
| Foothill High School | 2019 | 542 | 73 | 13% | 703 | 643 | 8.81 |
| | 2020 | 560 | 103 | 18% | 1035 | 955 | 9.27 |
| Global Community High School | 2019 | 29 | 0 | 0% | 0 | 0 | 0.00 |
| | 2020 | 41 | 5 | 12% | 36 | 27 | 5.40 |
| Green Valley High School | 2019 | 687 | 21 | 3% | 230 | 191 | 9.10 |
| | 2020 | 700 | 28 | 4% | 347 | 300 | 10.71 |
| Indian Springs High School | 2019 | 18 | 0 | 0% | 0 | 0 | 0.00 |
| | 2020 | 11 | 5 | 45% | 24 | 24 | 4.80 |
| Las Vegas Academy Of The Arts | 2019 | 403 | 140 | 35% | 1218 | 1136 | 8.11 |
| | 2020 | 380 | 131 | 34% | 928 | 854 | 6.52 |
| Las Vegas High School | 2019 | 711 | 80 | 11% | 631 | 593 | 7.41 |
| | 2020 | 620 | 161 | 26% | 1179 | 891 | 5.53 |
| Laughlin High School | 2019 | 38 | 5 | 13% | 6 | 6 | 1.20 |
| | 2020 | 44 | 6 | 14% | 34 | 34 | 5.67 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Legacy High School | 2019 | 582 | 22 | 4% | 165 | 158 | 7.18 |
| | 2020 | 586 | 10 | 2% | 90 | 75 | 7.50 |
| Liberty High School | 2019 | 634 | 143 | 23% | 1139 | 1074 | 7.51 |
| | 2020 | 665 | 171 | 26% | 1490 | 1472 | 8.61 |
| Mission High School | 2019 | 8 | 0 | 0% | 0 | 0 | 0.00 |
| | 2020 | 18 | 5 | 28% | 33 | 9 | 1.80 |
| Moapa Valley High School | 2019 | 119 | 50 | 42% | 560 | 515 | 10.30 |
| | 2020 | 111 | 45 | 41% | 385 | 385 | 8.56 |
| Mojave High School | 2019 | 458 | 20 | 4% | 204 | 100 | 5.00 |
| | 2020 | 471 | 12 | 3% | 146 | 97 | 8.08 |
| Morris Sunset | 2019 | 47 | 0 | 0% | 0 | 0 | 0.00 |
| | 2020 | 54 | 5 | 9% | 42 | 9 | 1.80 |
| Nevada Learning Academy at CCSD | 2019 | 97 | 31 | 32% | 315 | 288 | 9.29 |
| | 2020 | 83 | 20 | 24% | 225 | 177 | 8.85 |
| Northwest Career and Technical Academy | 2019 | 394 | 174 | 44% | 1430 | 1406 | 8.08 |
| | 2020 | 378 | 202 | 53% | 1750 | 1678 | 8.31 |
| Palo Verde High School | 2019 | 718 | 210 | 29% | 1266 | 1127 | 5.37 |
| | 2020 | 776 | 376 | 48% | 3211 | 2981 | 7.93 |
| Rancho High School | 2019 | 703 | 56 | 8% | 373 | 358 | 6.39 |
| | 2020 | 700 | 81 | 12% | 626 | 536 | 6.62 |
| Sandy Valley High School | 2019 | 13 | 6 | 46% | 48 | 48 | 8.00 |
| | 2020 | 18 | 5 | 28% | 32 | 26 | 5.20 |
| Shadow Ridge High School | 2019 | 703 | 73 | 10% | 546 | 523 | 7.16 |
| | 2020 | 716 | 96 | 13% | 717 | 676 | 7.04 |
| Sierra Vista High School | 2019 | 574 | 8 | 1% | 58 | 52 | 6.50 |
| | 2020 | 552 | 11 | 2% | 113 | 90 | 8.18 |
| Silverado High School | 2019 | 481 | 20 | 4% | 316 | 277 | 13.85 |
| | 2020 | 473 | 18 | 4% | 268 | 216 | 12.00 |
| South Academic Center | 2019 | 5 | 0 | 0% | 0 | 0 | 0.00 |
| Southeast Career Technical Academy | 2019 | 362 | 152 | 42% | 1717 | 1708 | 11.24 |
| | 2020 | 372 | 187 | 50% | 2272 | 2229 | 11.92 |
| Southwest Career & Tech Academy | 2019 | 331 | 196 | 59% | 1887 | 1875 | 9.57 |
| | 2020 | 310 | 192 | 62% | 2101 | 2070 | 10.78 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Spring Valley High School | 2019 | 535 | 27 | 5% | 188 | 170 | 6.30 |
| | 2020 | 564 | 88 | 16% | 496 | 412 | 4.68 |
| Summit View Jr./Sr. High School | 2019 | 5 | 0 | 0% | 0 | 0 | 0.00 |
| Sunrise Mountain High School | 2019 | 489 | 10 | 2% | 84 | 50 | 5.00 |
| | 2020 | 531 | 7 | 1% | 75 | 36 | 5.14 |
| Valley High School | 2019 | 622 | 12 | 2% | 134 | 94 | 7.83 |
| | 2020 | 545 | 29 | 5% | 320 | 254 | 8.76 |
| Veterans Tribute Career and Technical Academy | 2019 | 178 | 0 | 0% | 0 | 0 | 0.00 |
| | 2020 | 149 | 48 | 32% | 390 | 387 | 8.06 |
| Virgin Valley High School | 2019 | 154 | 51 | 33% | 386 | 353 | 6.92 |
| | 2020 | 159 | 46 | 29% | 369 | 348 | 7.57 |
| West Career & Tech Academy | 2019 | 294 | 118 | 40% | 857 | 834 | 7.07 |
| | 2020 | 308 | 183 | 59% | 1347 | 1332 | 7.28 |
| West Prep Institute | 2019 | 86 | 5 | 6% | 9 | 9 | 1.80 |
| | 2020 | 82 | 5 | 6% | 16 | 16 | 3.20 |
| Western High School | 2019 | 589 | 27 | 5% | 429 | 389 | 14.41 |
| | 2020 | 574 | 15 | 3% | 269 | 184 | 12.27 |

## Appendix 6: Annual Count of Career & Technical Education (CTE) Programs Availability by Career Cluster

| School | Program Cluster | SY 2020-21 | SY 2021-22 |
|---|---|---|---|
| Advanced Technologies Academy | Architecture and Construction | 1 | 1 |
| | Arts, A/V Technology, and Communications | 2 | 2 |
| | Business, Management and Administration | 2 | 2 |
| | Information Technology | 4 | 4 |
| | Law, Public Safety, Corrections and Security | 1 | |
| | Science, Technology, Engineering, and Mathematics | 1 | 1 |
| Arbor View High School | Arts, A/V Technology, and Communications | 3 | 3 |
| | Education and Training | 1 | 1 |
| | Health Science | 2 | 2 |
| | Hospitality and Tourism | 1 | 1 |
| | Information Technology | 1 | 1 |
| | Transportation, Distribution, and Logistics | 1 | 1 |
| Basic Academy of International Studies | Arts, A/V Technology, and Communications | 4 | 4 |
| | Business, Management and Administration | 1 | 1 |
| | Education and Training | 2 | 1 |
| | Human Services | 1 | 1 |
| | Information Technology | 1 | 1 |
| | Law, Public Safety, Corrections and Security | 1 | 1 |
| | Marketing | 1 | 1 |
| | Transportation, Distribution, and Logistics | 1 | 1 |
| Bonanza High School | Architecture and Construction | 1 | 1 |

| School | Program Cluster | SY 2020-21 | SY 2021-22 |
|---|---|---|---|
| | Arts, A/V Technology, and Communications | 3 | 2 |
| | Business, Management and Administration | 1 | 1 |
| | Finance | 1 | 1 |
| | Government and Public Administration | 1 | 1 |
| | Health Science | 1 | 1 |
| | Information Technology | 3 | 2 |
| | Law, Public Safety, Corrections and Security | 3 | 3 |
| Boulder City High School | Arts, A/V Technology, and Communications | 3 | 2 |
| | Information Technology | 2 | 1 |
| | Transportation, Distribution, and Logistics | 1 | 1 |
| Canyon Springs High School | Agriculture, Food and Natural Resources | 1 | 1 |
| | Arts, A/V Technology, and Communications | 2 | 2 |
| | Business, Management and Administration | 1 | 1 |
| | Education and Training | 2 | 2 |
| | Finance | 1 | 1 |
| | Government and Public Administration | 1 | 1 |
| | Hospitality and Tourism | 1 | 1 |
| | Information Technology | 2 | 2 |
| | Law, Public Safety, Corrections and Security | 1 | 1 |
| | Marketing | 1 | 1 |
| Centennial High School | Architecture and Construction | 1 | 1 |
| | Arts, A/V Technology, and Communications | 4 | 4 |
| | Education and Training | 2 | 2 |

| School | Program Cluster | SY 2020-21 | SY 2021-22 |
|---|---|---|---|
| | Government and Public Administration | 1 | 1 |
| | Hospitality and Tourism | 2 | 1 |
| | Law, Public Safety, Corrections and Security | 1 | 1 |
| | Manufacturing | 1 | 1 |
| | Marketing | 1 | 1 |
| Chaparral High School | Arts, A/V Technology, and Communications | 3 | 3 |
| | Education and Training | 1 | 1 |
| | Government and Public Administration | 1 | 1 |
| | Health Science | | 1 |
| | Hospitality and Tourism | 1 | 1 |
| | Law, Public Safety, Corrections and Security | 1 | 1 |
| | Marketing | 1 | 1 |
| | Transportation, Distribution, and Logistics | 1 | 1 |
| Cheyenne High School | Arts, A/V Technology, and Communications | 5 | 3 |
| | Business, Management and Administration | 1 | 1 |
| | Education and Training | 1 | 1 |
| | Government and Public Administration | 1 | 1 |
| | Health Science | 1 | 1 |
| | Hospitality and Tourism | 2 | 2 |
| | Information Technology | 3 | 3 |
| | Law, Public Safety, Corrections and Security | 1 | |
| Cimarron Memorial High School | Arts, A/V Technology, and Communications | 4 | 3 |
| | Education and Training | | 1 |

| School | Program Cluster | SY 2020-21 | SY 2021-22 |
|---|---|---|---|
| | Government and Public Administration | 1 | 1 |
| | Health Science | 1 | 1 |
| | Hospitality and Tourism | 1 | 1 |
| | Information Technology | 1 | 1 |
| | Manufacturing | 2 | 2 |
| Coronado High School | Architecture and Construction | 1 | 1 |
| | Arts, A/V Technology, and Communications | 4 | 4 |
| | Education and Training | 1 | 1 |
| | Hospitality and Tourism | 1 | 1 |
| | Information Technology | 1 | 1 |
| | Transportation, Distribution, and Logistics | 1 | 1 |
| Del Sol Academy of the Performing Arts | Arts, A/V Technology, and Communications | 2 | 2 |
| | Government and Public Administration | 1 | 1 |
| | Health Science | 1 | 1 |
| | Information Technology | 1 | 1 |
| | Law, Public Safety, Corrections and Security | 1 | 1 |
| Desert Oasis High School | Architecture and Construction | 1 | 1 |
| | Arts, A/V Technology, and Communications | 4 | 4 |
| | Education and Training | | 2 |
| | Government and Public Administration | 1 | 1 |
| | Health Science | 1 | 1 |
| | Information Technology | 1 | |
| | Law, Public Safety, Corrections and Security | 1 | 1 |

| School | Program Cluster | SY 2020-21 | SY 2021-22 |
|---|---|---|---|
| | Marketing | 1 | 1 |
| Desert Pines High School | Arts, A/V Technology, and Communications | 4 | 4 |
| | Business, Management and Administration | 1 | 1 |
| | Education and Training | 2 | 1 |
| | Government and Public Administration | 1 | 1 |
| | Health Science | 1 | 1 |
| | Hospitality and Tourism | 2 | 2 |
| | Human Services | 1 | 1 |
| | Information Technology | 2 | 2 |
| | Marketing | 1 | 1 |
| Desert Rose High School | Architecture and Construction | 1 | 1 |
| | Health Science | 2 | 2 |
| | Hospitality and Tourism | 1 | |
| | Information Technology | 1 | |
| | Law, Public Safety, Corrections and Security | 1 | |
| | Manufacturing | 2 | 2 |
| Durango High School | Arts, A/V Technology, and Communications | 3 | 3 |
| | Education and Training | 1 | 1 |
| | Finance | 1 | 1 |
| | Government and Public Administration | 1 | 1 |
| | Human Services | 1 | 1 |
| | Information Technology | 4 | 2 |
| | Marketing | | 1 |

| School | Program Cluster | SY 2020-21 | SY 2021-22 |
|---|---|---|---|
| East Career & Technical Academy | Architecture and Construction | 1 | 1 |
| | Arts, A/V Technology, and Communications | 2 | 2 |
| | Education and Training | 2 | 2 |
| | Health Science | 4 | 4 |
| | Hospitality and Tourism | 2 | 2 |
| | Information Technology | 3 | 3 |
| | Manufacturing | 2 | 2 |
| | Marketing | 1 | 1 |
| Ed W Clark High School | Arts, A/V Technology, and Communications | 2 | 2 |
| | Education and Training | 1 | 1 |
| | Finance | 2 | 2 |
| | Government and Public Administration | 1 | 1 |
| | Health Science | | 1 |
| | Information Technology | 2 | 3 |
| | Manufacturing | | 1 |
| | Marketing | 1 | 1 |
| | Transportation, Distribution, and Logistics | 1 | 1 |
| Eldorado High School | Arts, A/V Technology, and Communications | 4 | 3 |
| | Government and Public Administration | 1 | 1 |
| | Health Science | | 1 |
| | Information Technology | 5 | 4 |
| | Marketing | 1 | 1 |
| Foothill High School | Arts, A/V Technology, and Communications | 3 | 3 |

| School | Program Cluster | SY 2020-21 | SY 2021-22 |
|---|---|---|---|
| | Education and Training | 1 | 1 |
| | Health Science | 1 | 1 |
| | Human Services | 1 | 1 |
| | Information Technology | 3 | 2 |
| | Law, Public Safety, Corrections and Security | 1 | 1 |
| Green Valley High School | Architecture and Construction | 1 | 1 |
| | Arts, A/V Technology, and Communications | 4 | 5 |
| | Business, Management and Administration | 1 | 2 |
| | Education and Training | 1 | 1 |
| | Information Technology | 1 | 1 |
| | Marketing | 1 | 1 |
| Indian Springs High School | Arts, A/V Technology, and Communications | 2 | 3 |
| | Education and Training | 1 | 1 |
| | Information Technology | 1 | 1 |
| Las Vegas Academy of the Arts | Arts, A/V Technology, and Communications | 5 | 4 |
| | Information Technology | 2 | 1 |
| Las Vegas High School | Architecture and Construction | 1 | 1 |
| | Arts, A/V Technology, and Communications | 4 | 4 |
| | Education and Training | 1 | 1 |
| | Government and Public Administration | 1 | 1 |
| | Health Science | 1 | 1 |
| | Hospitality and Tourism | 2 | 2 |
| | Information Technology | 3 | 4 |

| School | Program Cluster | SY 2020-21 | SY 2021-22 |
|---|---|---|---|
| | Manufacturing | 1 | 1 |
| Laughlin Jr./Sr. High School | Hospitality and Tourism | 1 | 1 |
| Legacy High School | Architecture and Construction | 1 | 1 |
| | Arts, A/V Technology, and Communications | 5 | 5 |
| | Business, Management and Administration | 1 | 2 |
| | Education and Training | | 1 |
| | Hospitality and Tourism | 1 | 1 |
| | Information Technology | 1 | 1 |
| | Manufacturing | 1 | 1 |
| Liberty High School | Arts, A/V Technology, and Communications | 4 | 4 |
| | Education and Training | 1 | 1 |
| | Government and Public Administration | 1 | 1 |
| | Health Science | 1 | 1 |
| | Hospitality and Tourism | 1 | 1 |
| | Information Technology | 2 | 1 |
| | Law, Public Safety, Corrections and Security | 1 | 1 |
| | Marketing | 1 | 1 |
| Moapa Valley High School | Agriculture, Food and Natural Resources | 4 | 4 |
| | Architecture and Construction | 2 | 1 |
| | Arts, A/V Technology, and Communications | 4 | 2 |
| | Hospitality and Tourism | 1 | 1 |
| Mojave High School | Arts, A/V Technology, and Communications | 2 | 2 |
| | Education and Training | 1 | 1 |

| School | Program Cluster | SY 2020-21 | SY 2021-22 |
|---|---|---|---|
| | Government and Public Administration | 1 | 1 |
| | Health Science | 2 | 2 |
| | Hospitality and Tourism | 1 | 1 |
| | Manufacturing | 1 | |
| | Marketing | | 1 |
| Northwest Career & Technical Academy | Agriculture, Food and Natural Resources | 1 | 1 |
| | Architecture and Construction | 2 | 2 |
| | Arts, A/V Technology, and Communications | 3 | 3 |
| | Education and Training | 2 | 1 |
| | Health Science | 2 | 2 |
| | Hospitality and Tourism | 3 | 3 |
| | Manufacturing | 1 | 1 |
| | Marketing | 1 | 1 |
| | Science, Technology, Engineering, and Mathematics | 1 | 1 |
| Palo Verde High School | Architecture and Construction | 1 | 1 |
| | Arts, A/V Technology, and Communications | 3 | 3 |
| | Education and Training | 1 | 1 |
| | Finance | 1 | 1 |
| | Government and Public Administration | 1 | 1 |
| | Health Science | 1 | 1 |
| | Human Services | 1 | 1 |
| | Information Technology | 3 | 3 |
| | Law, Public Safety, Corrections and Security | 1 | 1 |

| School | Program Cluster | SY 2020-21 | SY 2021-22 |
|---|---|---|---|
| | Marketing | 1 | 1 |
| | Science, Technology, Engineering, and Mathematics | 1 | 1 |
| Rancho High School | Arts, A/V Technology, and Communications | 5 | 5 |
| | Education and Training | 1 | 1 |
| | Government and Public Administration | 1 | 1 |
| | Health Science | 3 | 3 |
| | Hospitality and Tourism | 1 | 1 |
| | Law, Public Safety, Corrections and Security | 1 | 1 |
| | Science, Technology, Engineering, and Mathematics | 1 | 1 |
| | Transportation, Distribution, and Logistics | 3 | 3 |
| Sandy Valley Jr-Sr High School | Agriculture, Food and Natural Resources | 2 | 2 |
| Shadow Ridge High School | Architecture and Construction | 1 | 1 |
| | Arts, A/V Technology, and Communications | 3 | 4 |
| | Education and Training | 1 | 1 |
| | Government and Public Administration | 1 | 1 |
| | Hospitality and Tourism | 1 | 1 |
| | Information Technology | 3 | 2 |
| | Law, Public Safety, Corrections and Security | 1 | 1 |
| | Marketing | 1 | 1 |
| | Transportation, Distribution, and Logistics | 1 | 1 |
| Sierra Vista High School | Arts, A/V Technology, and Communications | 4 | 3 |
| | Government and Public Administration | 1 | 1 |

| School | Program Cluster | SY 2020-21 | SY 2021-22 |
|---|---|---|---|
| | Hospitality and Tourism | 1 | 1 |
| | Information Technology | 1 | 2 |
| | Law, Public Safety, Corrections and Security | 2 | 2 |
| | Manufacturing | 1 | 1 |
| | Marketing | 1 | 1 |
| Silverado High School | Arts, A/V Technology, and Communications | 4 | 4 |
| | Government and Public Administration | 1 | 1 |
| | Health Science | 1 | |
| | Hospitality and Tourism | 1 | 1 |
| | Law, Public Safety, Corrections and Security | 1 | 1 |
| | Manufacturing | 1 | 1 |
| Southeast Career & Technical Academy | Architecture and Construction | 2 | 2 |
| | Arts, A/V Technology, and Communications | 2 | 2 |
| | Education and Training | 1 | 1 |
| | Health Science | 3 | 4 |
| | Hospitality and Tourism | 1 | 1 |
| | Human Services | 1 | 1 |
| | Information Technology | 4 | 4 |
| | Manufacturing | 1 | 1 |
| | Marketing | 1 | 1 |
| | Transportation, Distribution, and Logistics | 1 | 1 |
| Southwest Career & Technical Academy | Architecture and Construction | | 1 |
| | Arts, A/V Technology, and Communications | 4 | 2 |

| School | Program Cluster | SY 2020-21 | SY 2021-22 |
|---|---|---|---|
| | Education and Training | 1 | 1 |
| | Health Science | 4 | 5 |
| | Hospitality and Tourism | 3 | 3 |
| | Human Services | | 1 |
| | Information Technology | 4 | 4 |
| | Science, Technology, Engineering, and Mathematics | 1 | 1 |
| | Transportation, Distribution, and Logistics | 1 | 2 |
| Spring Valley High School | Arts, A/V Technology, and Communications | 3 | 3 |
| | Business, Management and Administration | 1 | 1 |
| | Education and Training | 1 | 1 |
| | Government and Public Administration | 1 | 1 |
| | Information Technology | 2 | 2 |
| | Transportation, Distribution, and Logistics | 1 | 1 |
| Sunrise Mountain High School | Arts, A/V Technology, and Communications | 4 | 4 |
| | Education and Training | 2 | 1 |
| | Government and Public Administration | 1 | 1 |
| | Hospitality and Tourism | 1 | 1 |
| | Information Technology | 2 | 2 |
| | Law, Public Safety, Corrections and Security | 1 | 1 |
| | Manufacturing | 2 | 1 |
| | Transportation, Distribution, and Logistics | 1 | 1 |
| Valley High School | Arts, A/V Technology, and Communications | 2 | 2 |
| | Education and Training | 1 | 1 |

| School | Program Cluster | SY 2020-21 | SY 2021-22 |
|---|---|---|---|
| | Government and Public Administration | 1 | 1 |
| | Hospitality and Tourism | 1 | 1 |
| | Information Technology | 1 | 1 |
| | Law, Public Safety, Corrections and Security | 1 | 1 |
| | Marketing | 1 | 1 |
| Veterans Tribute Career Technical Academy | Arts, A/V Technology, and Communications | 1 | |
| | Government and Public Administration | 1 | 1 |
| | Health Science | 1 | 1 |
| | Information Technology | 1 | 1 |
| | Law, Public Safety, Corrections and Security | 4 | 3 |
| Virgin Valley High School | Agriculture, Food and Natural Resources | 2 | 2 |
| | Architecture and Construction | 1 | 1 |
| | Arts, A/V Technology, and Communications | 3 | 3 |
| | Hospitality and Tourism | 1 | 1 |
| | Information Technology | 2 | 2 |
| | Marketing | 1 | 1 |
| | Transportation, Distribution, and Logistics | 1 | 1 |
| West Career & Technical Academy | Agriculture, Food and Natural Resources | 1 | 1 |
| | Arts, A/V Technology, and Communications | 4 | 4 |
| | Business, Management and Administration | 2 | 3 |
| | Finance | 1 | 1 |
| | Health Science | 4 | 5 |
| | Information Technology | 2 | 3 |

| School | Program Cluster | SY 2020-21 | SY 2021-22 |
|---|---|---|---|
| | Science, Technology, Engineering, and Mathematics | 1 | 1 |
| West Preparatory Institute Jr Sr High School | Arts, A/V Technology, and Communications | 3 | 3 |
| | Education and Training | | 1 |
| | Hospitality and Tourism | 1 | 1 |
| | Information Technology | 1 | 2 |
| Western High School | Arts, A/V Technology, and Communications | 3 | 3 |
| | Government and Public Administration | 1 | 1 |
| | Health Science | 4 | 4 |
| | Hospitality and Tourism | 1 | 1 |
| | Information Technology | 2 | 2 |
| | Marketing | 1 | 1 |
| | Transportation, Distribution, and Logistics | 1 | 1 |

## Appendix 7: Course Enrollment at Desert Oasis HS, Green Valley HS, and Spring Valley HS

| School | Program Cluster | Program Study | Course Type | # Enrolled |
|---|---|---|---|---|
| **Desert Oasis HS** | **Architecture and Construction** | Furniture and Cabinetmaking | Completer | 105 |
| | | | Not Completer | 613 |
| | **Arts, A/V Technology, and Communications** | Graphic Design | Not Completer | 263 |
| | | Photography | Completer | 105 |
| | | | Not Completer | 633 |
| | | Theatre Technology | Completer | 54 |
| | | | Not Completer | 318 |
| | | Video Production | Completer | 93 |
| | | | Not Completer | 289 |
| | **Business, Management and Administration** | Principles of Business and Marketing*(common/foundational Course) | Not Completer | 507 |
| | **Education and Training** | Teaching and Training | Not Completer | 268 |
| | **Government and Public Administration** | Military Science | Completer | 2 |
| | | | Not Completer | 287 |
| | **Health Science** | Health Science*(common/foundational course) | Not Completer | 519 |
| | | Sports Medicine | Completer | 196 |
| | | | Not Completer | 319 |
| | **Information Technology** | Web Design and Development | Completer | 68 |
| | | | Not Completer | 180 |
| | **Law, Public Safety, Corrections and Security** | Forensic Science | Completer | 272 |
| | | | Not Completer | 922 |
| | **Marketing** | Marketing | Completer | 164 |
| | | | Not Completer | 222 |
| | | Furniture and Cabinetmaking | Completer | 61 |

| School | Program Cluster | Program Study | Course Type | # Enrolled |
|---|---|---|---|---|
| **Green Valley HS** | **Architecture and Construction** | | Not Completer | 563 |
| | **Arts, A/V Technology, and Communications** | Fashion Textiles and Design | Not Completer | 183 |
| | | Multimedia Communications | Completer | 1 |
| | | | Not Completer | 211 |
| | | Photography | Completer | 37 |
| | | | Not Completer | 715 |
| | | Theatre Technology | Completer | 14 |
| | | | Not Completer | 151 |
| | | Video Production | Completer | 31 |
| | | | Not Completer | 510 |
| | **Business, Management and Administration** | Administrative Services | Completer | 2 |
| | | | Not Completer | 26 |
| | | Business Management | Completer | 108 |
| | | | Not Completer | 962 |
| | | Entrepreneurship | Completer | 16 |
| | | Principles of Business and Marketing*(common/foundational Course) | Not Completer | 208 |
| | **Education and Training** | Teaching and Training | Completer | 9 |
| | | | Not Completer | 396 |
| | **Information Technology Marketing** | Cybersecurity | Not Completer | 336 |
| | | Marketing | Completer | 14 |
| | | | Not Completer | 51 |
| **Spring Valley HS** | **Arts, A/V Technology, and Communications** | Multimedia Communications | Not Completer | 84 |
| | | Photography | Completer | 146 |
| | | | Not Completer | 534 |

| School | Program Cluster | Program Study | Course Type | # Enrolled |
|---|---|---|---|---|
| | | Theatre Technology | Completer | 67 |
| | | | Not Completer | 234 |
| | | Video Production | Completer | 88 |
| | | | Not Completer | 311 |
| | **Business, Management and Administration** | Business Management | Completer | 29 |
| | | | Not Completer | 96 |
| | | Principles of Business and Marketing*(common/foundational Course) | Not Completer | 273 |
| | **Education and Training** | Teaching and Training | Completer | 84 |
| | | | Not Completer | 279 |
| | **Government and Public Administration** | Military Science | Completer | 20 |
| | | | Not Completer | 328 |
| | **Information Technology** | Computer Science | Completer | 8 |
| | | | Not Completer | 237 |
| | | Cybersecurity | Not Completer | 166 |
| | **Transportation, Distribution, and Logistics** | Automotive Technology | Completer | 102 |
| | | | Not Completer | 425 |

## Appendix 8: Course Enrollment at Non-Comprehensive High Schools, Cheyenne HS, and Western HS

| School | Program Cluster | Program Study | Course Type | # Enrolled |
|---|---|---|---|---|
| **Non-Comprehensive** | **Agriculture, Food and Natural Resources** | Environmental Management | Completer | 81 |
| | | | Not Completer | 195 |
| | | Ornamental Horticulture/Greenhouse Management | Completer | 23 |
| | | Veterinary Science | Completer | 53 |
| | **Architecture and Construction** | Architectural Design | Completer | 176 |
| | | | Not Completer | 460 |
| | | Construction Technology | Completer | 306 |
| | | | Not Completer | 724 |
| | | Drafting and Design | Completer | 241 |
| | | | Not Completer | 709 |
| | **Arts, A/V Technology, and Communications** | Fashion Textiles and Design | Completer | 169 |
| | | | Not Completer | 542 |
| | | Graphic Design | Completer | 735 |
| | | | Not Completer | 2208 |
| | | Interior Design | Completer | 90 |
| | | | Not Completer | 215 |
| | | Multimedia Communications | Not Completer | 30 |
| | | Photography | Completer | 365 |
| | | | Not Completer | 1646 |
| | | Theatre Technology | Completer | 71 |
| | | | Not Completer | 395 |
| | | Video Production | Completer | 361 |
| | | | Not Completer | 1492 |
| | **Business, Management and Administration** | Administrative Services | Completer | 114 |
| | | | Not Completer | 339 |

| School | Program Cluster | Program Study | Course Type | # Enrolled |
|---|---|---|---|---|
| | | Business Management | Completer | 236 |
| | | | Not Completer | 916 |
| | **Education and Training** | Early Childhood Education | Completer | 194 |
| | | | Not Completer | 353 |
| | | Teaching and Training | Completer | 272 |
| | | | Not Completer | 989 |
| | **Finance** | Accounting and Finance | Completer | 88 |
| | | | Not Completer | 273 |
| | **Health Science** | Biomedical | Completer | 461 |
| | | | Not Completer | 1149 |
| | | Community Health Science | Completer | 324 |
| | | Dental Science | Completer | 96 |
| | | | Not Completer | 219 |
| | | Health Information Management | Completer | 71 |
| | | | Not Completer | 85 |
| | | Medical Assisting | Completer | 54 |
| | | Nursing Assistant | Completer | 625 |
| | | Pharmacy Practice | Completer | 301 |
| | | Respiratory Science | Completer | 59 |
| | | | Not Completer | 68 |
| | | Sports Medicine | Completer | 562 |
| | | | Not Completer | 605 |
| | **Hospitality and Tourism** | Baking and Pastry | Completer | 298 |
| | | | Not Completer | 302 |
| | | Culinary Arts | Completer | 860 |
| | | | Not Completer | 1902 |
| | | Hospitality and Tourism | Completer | 408 |

| School | Program Cluster | Program Study | Course Type | # Enrolled |
|---|---|---|---|---|
| | | | Not Completer | 964 |
| | **Human Services** | Cosmetology | Completer | 219 |
| | | | Not Completer | 602 |
| | | Foods and Nutrition | Not Completer | 273 |
| | **Information Technology** | Animation | Completer | 305 |
| | | | Not Completer | 911 |
| | | Cisco Networking Academy | Completer | 22 |
| | | | Not Completer | 75 |
| | | Computer Science | Completer | 327 |
| | | | Not Completer | 2739 |
| | | Cybersecurity | Completer | 196 |
| | | | Not Completer | 1112 |
| | | Digital Game Development | Completer | 391 |
| | | | Not Completer | 1208 |
| | | Information Technology Networking | Completer | 232 |
| | | | Not Completer | 321 |
| | | Information Technology Service and Support | Not Completer | 30 |
| | | Web Design and Development | Completer | 112 |
| | | | Not Completer | 246 |
| | **Law, Public Safety, Corrections and Security** | Criminal Justice | Completer | 94 |
| | | | Not Completer | 121 |
| | | Forensic Science | Not Completer | 138 |
| | **Manufacturing** | Automation Technology | Completer | 20 |
| | | | Not Completer | 658 |
| | | Manufacturing Technologies | Completer | 24 |
| | | | Not Completer | 53 |
| | | Mechanical Technology | Completer | 304 |

| School | Program Cluster | Program Study | Course Type | # Enrolled |
|---|---|---|---|---|
| | | | Not Completer | 731 |
| | | Welding Technology | Completer | 79 |
| | | | Not Completer | 559 |
| | **Marketing** | Marketing | Completer | 305 |
| | | | Not Completer | 523 |
| | **Science, Technology, Engineering, and Mathematics** | Architectural and Civil Engineering | Completer | 517 |
| | | Electrical Engineering | Completer | 88 |
| | | Mechanical Engineering | Completer | 89 |
| | **Transportation, Distribution, and Logistics** | Automotive Service Technician | Completer | 62 |
| | | | Not Completer | 280 |
| | | Automotive Technology | Completer | 57 |
| | | | Not Completer | 202 |
| | | Diesel Technology | Completer | 27 |
| **Cheyenne HS Western HS** | **Arts, A/V Technology, and Communications** | Graphic Design | Completer | 26 |
| | | | Not Completer | 35 |
| | | Multimedia Communications | Completer | 14 |
| | | | Not Completer | 146 |
| | | Photography | Completer | 1 |
| | | Theatre Technology | Completer | 21 |
| | | | Not Completer | 247 |
| | | Video Production | Completer | 38 |
| | | | Not Completer | 378 |
| | **Business, Management and Administration** | Administrative Services | Completer | 35 |
| | | | Not Completer | 385 |
| | | Entrepreneurship | Completer | 28 |
| | | | Not Completer | 20 |

| School | Program Cluster | Program Study | Course Type | # Enrolled |
|---|---|---|---|---|
| | **Education and Training** | Teaching and Training | Completer | 31 |
| | | | Not Completer | 245 |
| | **Government and Public Administration** | Military Science | Completer | 35 |
| | | | Not Completer | 488 |
| | **Health Science** | Biomedical | Completer | 18 |
| | | | Not Completer | 215 |
| | **Hospitality and Tourism** | Baking and Pastry | Completer | 40 |
| | | | Not Completer | 139 |
| | | Culinary Arts | Completer | 90 |
| | | | Not Completer | 841 |
| | **Information Technology** | Animation | Completer | 51 |
| | | | Not Completer | 315 |
| | | Computer Science | Completer | 21 |
| | | | Not Completer | 158 |
| | | Cybersecurity | Completer | 20 |
| | | | Not Completer | 520 |
| | **Law, Public Safety, Corrections and Security** | Forensic Science | Completer | 12 |
| | | | Not Completer | 16 |
| | **Arts, A/V Technology, and Communications** | Graphic Design | Completer | 104 |
| | | | Not Completer | 504 |
| | | Photography | Completer | 148 |
| | | | Not Completer | 533 |
| | | Video Production | Completer | 64 |
| | | | Not Completer | 433 |
| | **Government and Public Administration** | Military Science | Completer | 24 |
| | | | Not Completer | 327 |

| School | Program Cluster | Program Study | Course Type | # Enrolled |
|---|---|---|---|---|
| | **Health Science** | Biomedical | Completer | 39 |
| | | | Not Completer | 190 |
| | | Community Health Science | Completer | 72 |
| | | Health Information Management | Completer | 33 |
| | | | Not Completer | 73 |
| | | Nursing Assistant | Completer | 26 |
| | | Pharmacy Practice | Completer | 51 |
| | | Sports Medicine | Completer | 80 |
| | | | Not Completer | 87 |
| | **Hospitality and Tourism** | Culinary Arts | Completer | 191 |
| | | | Not Completer | 874 |
| | **Information Technology** | Animation | Completer | 77 |
| | | | Not Completer | 481 |
| | | Computer Science | Completer | 33 |
| | | | Not Completer | 491 |
| | **Marketing** | Marketing | Completer | 58 |
| | | | Not Completer | 140 |
| | | Sports and Entertainment Marketing | Completer | 12 |
| | **Transportation, Distribution, and Logistics** | Automotive Technology | Completer | 149 |
| | | | Not Completer | 435 |

## Appendix Table 9: NSHE Majors with Conferred Degrees by Type

| NSHE Majors | Degree Type | School Year | Total Graduates |
|---|---|---|---|
| Civil Engineering | Bachelor's | 2019 | 112 |
| | Master's | | 39 |
| | Doctoral | | 13 |
| | Certificate of Achievement | | 1 |
| | Associates | | 16 |
| | Skills Certificate | | 11 |
| Electrical and Electronics Engineering Technicians | Bachelor's | 2019 | 5 |
| | Certificate of Achievement | | 1 |
| | Associates | | 37 |
| Electrical Engineers | Bachelor's | 2019 | 71 |
| | Master's | | 10 |
| | Doctoral | | 7 |
| Heating, Air Conditioning, and Refrigeration Mechanics and Installers | Certificate of Achievement | 2019 | 18 |
| | Associates | | 17 |
| | Skills Certificate | | 20 |
| Industrial Engineers Technicians | Associates | 2019 | 25 |
| | Skills Certificate | | 71 |
| | Certificate of Achievement | | 4 |
| Industrial Machinery Mechanics | Skills Certificate | 2019 | 19 |
| | Certificate of Achievement | | 17 |
| Mechanical Engineers | Bachelor's | 2019 | 232 |
| | Master's | | 13 |
| | Doctoral | | 8 |
| Medical & Clinical Laboratory Technologists | Associates | 2019 | 9 |
| | Bachelor's | | 7 |
| | Skills Certificate | | 82 |
| Network & Computer Systems Analysts & Administrators | Bachelor's | 2019 | 189 |
| | Master's | | 32 |
| | Doctoral | | 2 |

| | | | |
|---|---|---|---|
| | Skills Certificate | | 376 |
| | Associates | | 14 |
| | Certificate of Achievement | | 1 |
| Nursing Registered Nurses | Bachelor's | 2019 | 552 |
| | Master's | | 39 |
| | Doctoral | | 28 |
| | Associates | | 345 |
| Software Developers | Bachelor's | 2019 | 220 |
| | Master's | | 43 |
| | Doctoral | | 9 |
| | Associates | | 48 |
| | Certificate of Achievement | | 1 |
| Teachers | Bachelor's | 2019 | 369 |
| | Master's | | 381 |
| | Doctoral | | 18 |
| Civil Engineering | Bachelor's | 2020 | 134 |
| | Master's | | 34 |
| | Doctoral | | 17 |
| | Associates | | 7 |
| | Skills Certificate | | 5 |
| Electrical and Electronics Engineering Technicians | Bachelor's | 2020 | 8 |
| | Certificate of Achievement | | 1 |
| | Associates | | 3 |
| Electrical Engineers | Bachelor's | 2020 | 83 |
| | Master's | | 2 |
| | Doctoral | | 9 |
| Heating, Air Conditioning, and Refrigeration Mechanics and Installers | Certificate of Achievement | 2020 | 8 |
| | Associates | | 24 |
| | Skills Certificate | | 21 |
| Industrial Engineers Technicians | Certificate of Achievement | 2020 | 4 |
| | Associates | | 21 |
| | Skills Certificate | | 69 |
| Industrial Machinery Mechanics | Skills Certificate | 2020 | 15 |

| | | | |
|---|---|---|---|
| | Certificate of Achievement | | 15 |
| Mechanical Engineers | Bachelor's | 2020 | 244 |
| | Master's | | 9 |
| | Doctoral | | 10 |
| Medical & Clinical Laboratory Technologists | Associates | 2020 | 9 |
| | Bachelor's | | 5 |
| | Skills Certificate | | 59 |
| Network & Computer Systems Analysts & Administrators | Bachelor's | 2020 | 229 |
| | Master's | | 32 |
| | Doctoral | | 5 |
| | Skills Certificate | | 510 |
| | Certificate of Achievement | | 4 |
| | Associates | | 28 |
| Nursing Licensed Practical and Licensed Vocational Nurses | Certificate of Achievement | 2020 | 5 |
| Nursing Registered Nurses | Bachelor's | 2020 | 630 |
| | Master's | | 59 |
| | Doctoral | | 39 |
| | Associates | | 335 |
| Software Developers | Bachelor's | 2020 | 271 |
| | Master's | | 42 |
| | Doctoral | | 13 |
| | Associates | | 110 |
| Teachers | Bachelor's | 2020 | 468 |
| | Master's | | 446 |
| | Doctoral | | 21 |
| Civil Engineering | Bachelor's | 2021 | 123 |
| | Master's | | 40 |
| | Doctoral | | 15 |
| | Associates | | 8 |
| | Skills Certificate | | 10 |
| Electrical and Electronics Engineering Technicians | Bachelor's | 2021 | 8 |
| | Certificate of Achievement | | 1 |
| | Associates | | 41 |

| | | | |
|---|---|---|---|
| Electrical Engineers | Bachelor's | 2021 | 88 |
| | Master's | | 7 |
| | Doctoral | | 10 |
| Heating, Air Conditioning, and Refrigeration Mechanics and Installers | Certificate of Achievement | 2021 | 13 |
| | Associates | | 253 |
| | Skills Certificate | | 21 |
| Industrial Engineers Technicians | Associates | 2021 | 16 |
| | Skills Certificate | | 69 |
| | Certificate of Achievement | | 4 |
| Industrial Machinery Mechanics | Skills Certificate | 2021 | 11 |
| | Certificate of Achievement | | 7 |
| Mechanical Engineers | Bachelor's | 2021 | 250 |
| | Master's | | 14 |
| | Doctoral | | 6 |
| Medical & Clinical Laboratory Technologists | Associates | 2021 | 12 |
| | Bachelor's | | 6 |
| | Skills Certificate | | 36 |
| Network & Computer Systems Analysts & Administrators | Bachelor's | 2021 | 211 |
| | Master's | | 27 |
| | Skills Certificate | | 439 |
| | Certificate of Achievement | | 10 |
| | Associates | | 38 |
| Nursing Licensed Practical and Licensed Vocational Nurses | Certificate of Achievement | 2021 | 16 |
| Nursing Registered Nurses | Bachelor's | 2021 | 734 |
| | Master's | | 69 |
| | Doctoral | | 47 |
| | Associates | | 352 |
| Software Developers | Bachelor's | 2021 | 283 |
| | Master's | | 50 |
| | Doctoral | | 6 |
| | Certificate of Achievement | | 3 |
| | Associates | | 68 |

| | | | |
|---|---|---|---|
| Teachers | Bachelor's | 2021 | 462 |
| | Master's | | 366 |
| | Doctoral | | 22 |