

Aligning K-16 Workforce Pipelines for a New Economy

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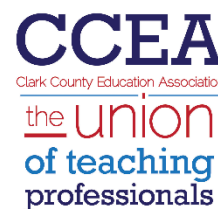


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Brief

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 as 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 together in making use of those assets in order to form a workforce pipeline leading to a more diversified economy in Southern Nevada.

This brief, written by one of the authors of the study in conjunction with CCEA, provides a summary of its principal results for administrators, educators, and legislators and should be read in conjunction with the full report, “Aligning K-16 Workforce Pipelines for a New Economy.”

The following questions guided this report:

1. What are the current and future workforce needs that align with a diversified Southern Nevada economy?
2. Does Southern Nevada’s K-16 to workforce pipeline align with occupations and industries that will lead to a more diversified economy?
3. Are Southern Nevada’s K-12 students college and career ready with the skills and knowledge necessary to serve in the occupations and industries aligned with a diversified economy?
4. What are the gaps in the Southern Nevada K-16 to workforce pipeline?
5. What steps need to take place in order to strengthen and better align the Southern Nevada K-16 to workforce pipeline?

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%. Researchers examined occupations that are of economic importance locally; identifying those that have higher location quotients demonstrating a more diverse economy, and those with lower location quotients demonstrating an opportunity

for future development. Occupations that are specialized compared to the nation and forecasted to increase at a high level are those within the engineering, health, education, construction, computer science, and management fields (see Table 8 for specific occupations), of which 74% require post-secondary education as an entry into the profession. Occupations that have a lower local proportionate share than the nation and are expected to increase by 2030 are those in manufacturing, logistics, business, medical, and data analytics (see Table 10 for specific occupations), 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 5th in the state for the most economically diverse county (See Table 25). In 2022, Las Vegas Global Economic Alliance released the LVGEA Workforce Blueprint which identified 100 occupations aligned with targeted industries. The majority of targeted occupations identified by LVGEA that lead to a diversified economy require post-secondary education. Southern Nevada's economic diversification hinges on the existence of a diverse workforce whom have acquired the skills and knowledge needed to serve in the targeted occupations.

Aligning the K-16 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. 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 options. The availability of CTE programs at all high schools 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 to workforce pipeline is the existence of both CTE programs and dual enrollment options, which 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, but the presence of programs does not equate to sufficiency of

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. In short, the annual number of high school graduates in CTE programs falls far short of the annual demand estimate, which is 50% the annual demand identified by LVGEA and 20% the annual demand identified by DETR.

Identifying Gaps in the K-16 to Workforce Pipeline

In order to understand the impact of CTE programs on student outcomes, student data was collected for every high school student who attended CCSD between the 2018-19 and 2021-22 school years. CCSD CTE completers, or those who complete three or more courses in a program of study, outperformed students who did not completed CTE programs (See Table 15). The average ACT score for CCSD CTE completers was 21.37, compared to 16.83 for other students; and 92% of CCSD 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.

The K-16 to workforce pipeline should not be accessible to only a specific subset of our population. Demographic indicators suggest approximately 20% of eligible high school students become completers, and they are 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 gaps: (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 *score lower* on their ACT than those who do not need the support. Last, geographic and economic indicators impact students’ access to career pathways: (1) as the median household income increases for CTE completers, the average ACT scores increase (Figure 11); and (2) students who live in densely populated areas score lower on their ACT scores (Figure 12). Data suggests a clear gap in the accessibility of the current K-16 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 increased student outcomes (e.g., GPA, ACT, graduation). Although variability occurs within CTE programs, Southern Nevada needs to identify programs that lead to increased outcomes for all students, including our most diverse and economically disadvantaged. Two conclusions are important to note regarding CCSD CTE programs: (1) when the percentage of CTE completers in a school increases, the average score on the ACT increases (See Figure 7); and (2) when the number of CCR diplomas increase at a school, the average ACT scores increases (Figure 9). Identified within these figures are schools that have demonstrated success for students, and it is imperative that this data be used to better understand Southern Nevada's path toward a more diversified workforce and economy.

The aim of a successful CTE program is to matriculate CCSD students into the Nevada System of Higher Education to achieve degrees (e.g., certificates, associates, bachelors) in targeted occupations. NSHE institutions award approximately 15,000 associate and bachelor's degrees annually, over half of the recipients are expected to stay in Nevada. The number of NSHE annually conferred degrees aligned with the in-demand occupations identified by DETR (Table 22) demonstrates a supply less than half the minimum workforce needs of Clark County for the current decade (Table 24). The remaining workforce positions that need to be filled are by immigration, causing more undue stress on housing, public support, and education.

Strengthening and Aligning the K-16 to Workforce Pipeline

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 K-16 education, workforce, 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. 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. 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. 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.

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

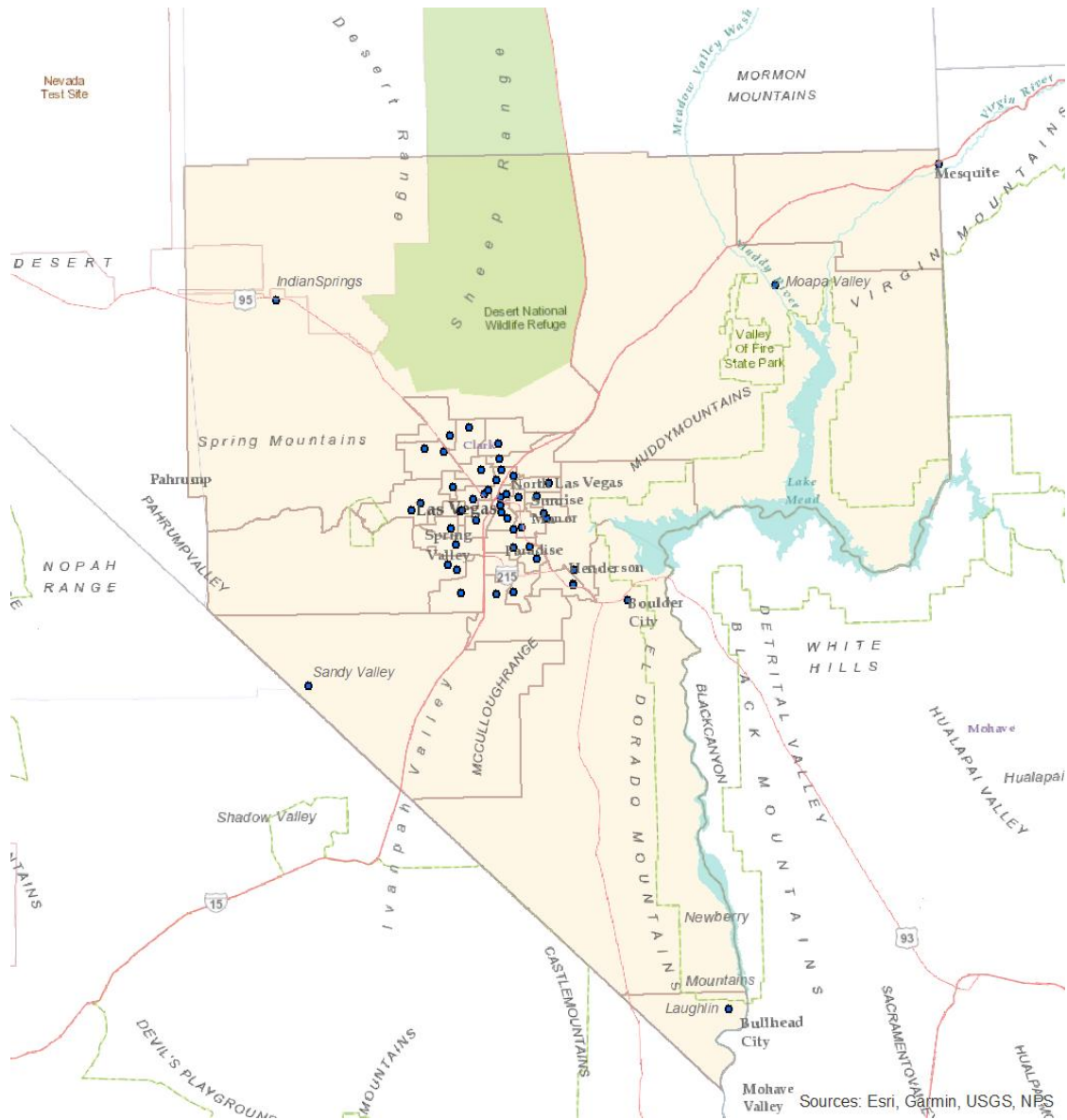
Source	Data Supplied
NDE	Annual list of student achievement, attendance, and CTE enrollment by individual school.
NSHE	Annual dual enrollment data by school and enrollment/graduation numbers by degree.
CSN	Annual list of dual and concurrent enrollment by CCSD school and course.
CCSD	Annual list of (de-identified) 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. 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.

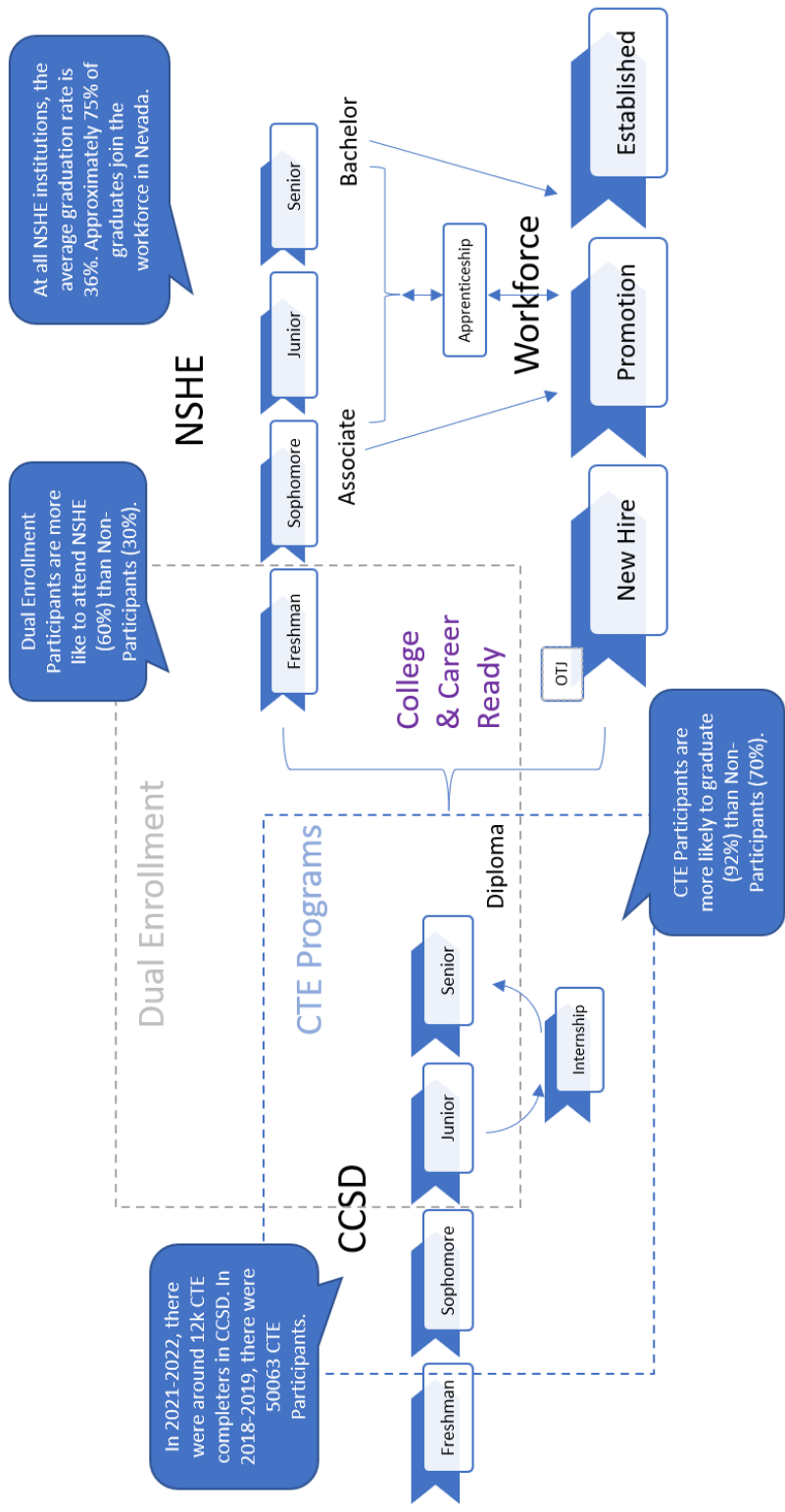
Figure 1: Study area, showing CCSD attendance zones (brown outlines) and secondary schools (blue dots)



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
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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 in occupation 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.

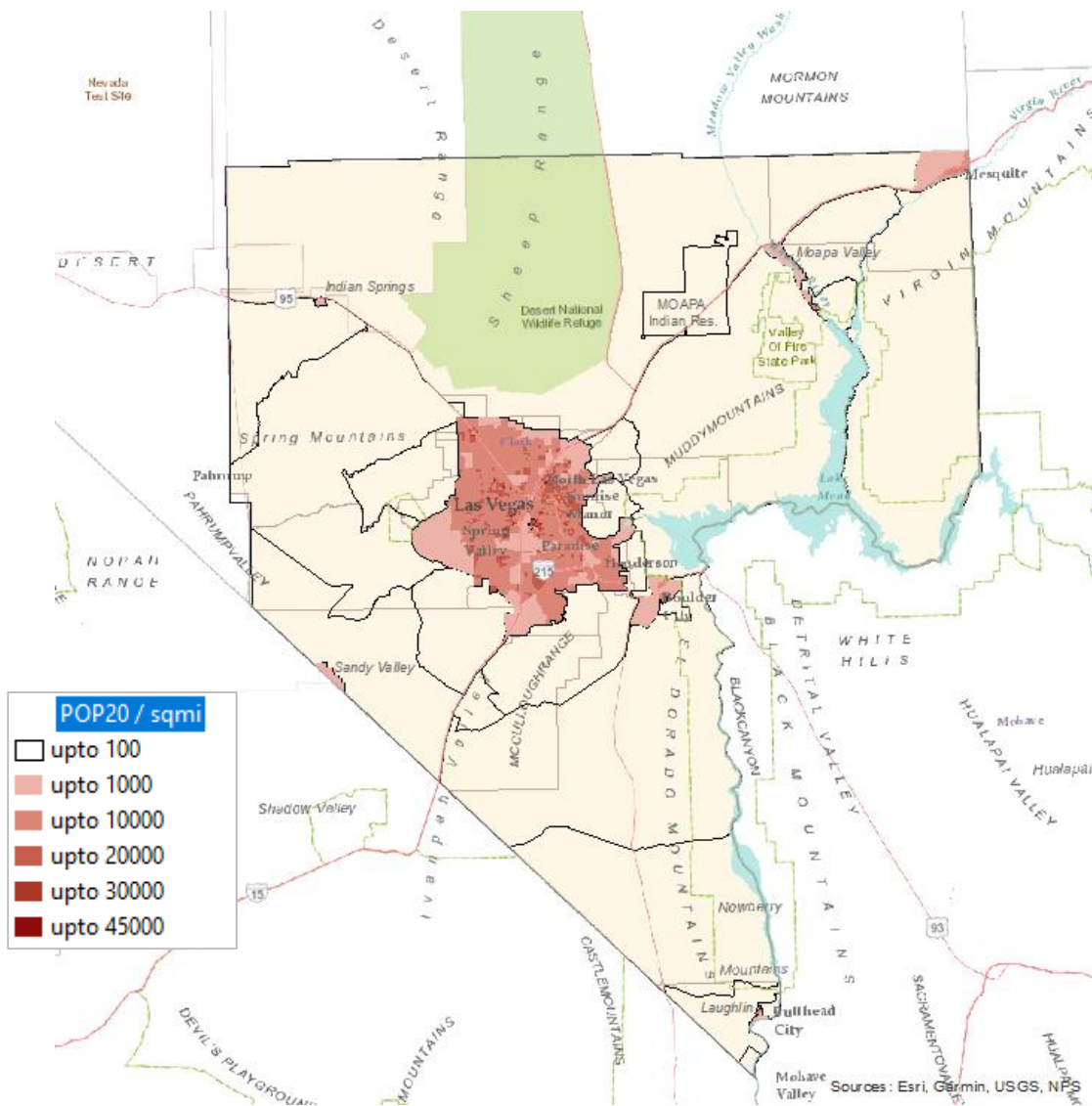
- Emerging occupations of the LVGEA are characterized as occupations that have less concentration in Southern Nevada in 2020 but their concentration is forecasted to increase in 2030. Electrical engineers, mechanical engineers, and secondary school teachers are examples of Emerging occupations.
- Transforming 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 coterminous 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.

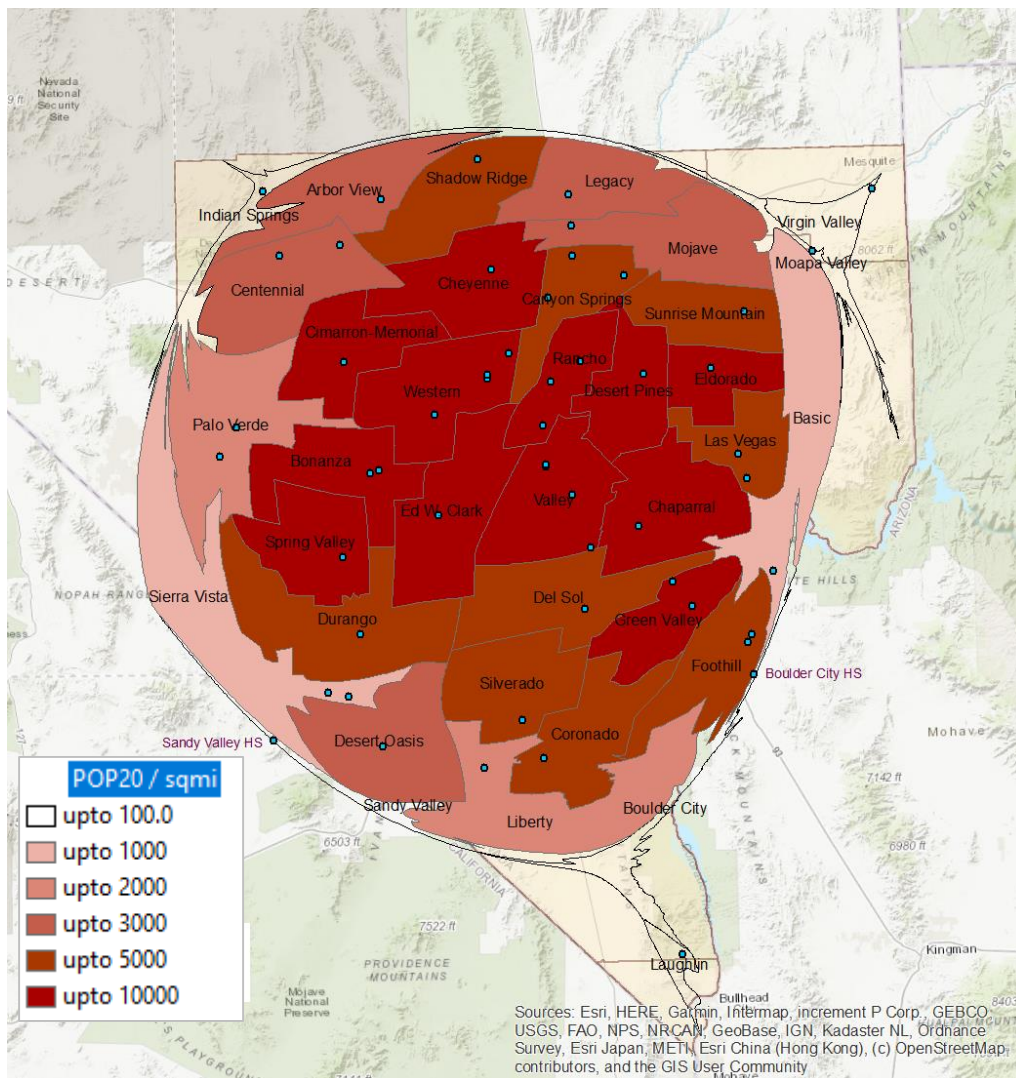
(Source: 2020 Census; brown outlines are CCSD zones; black outlines delineate rural block-groups)

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).

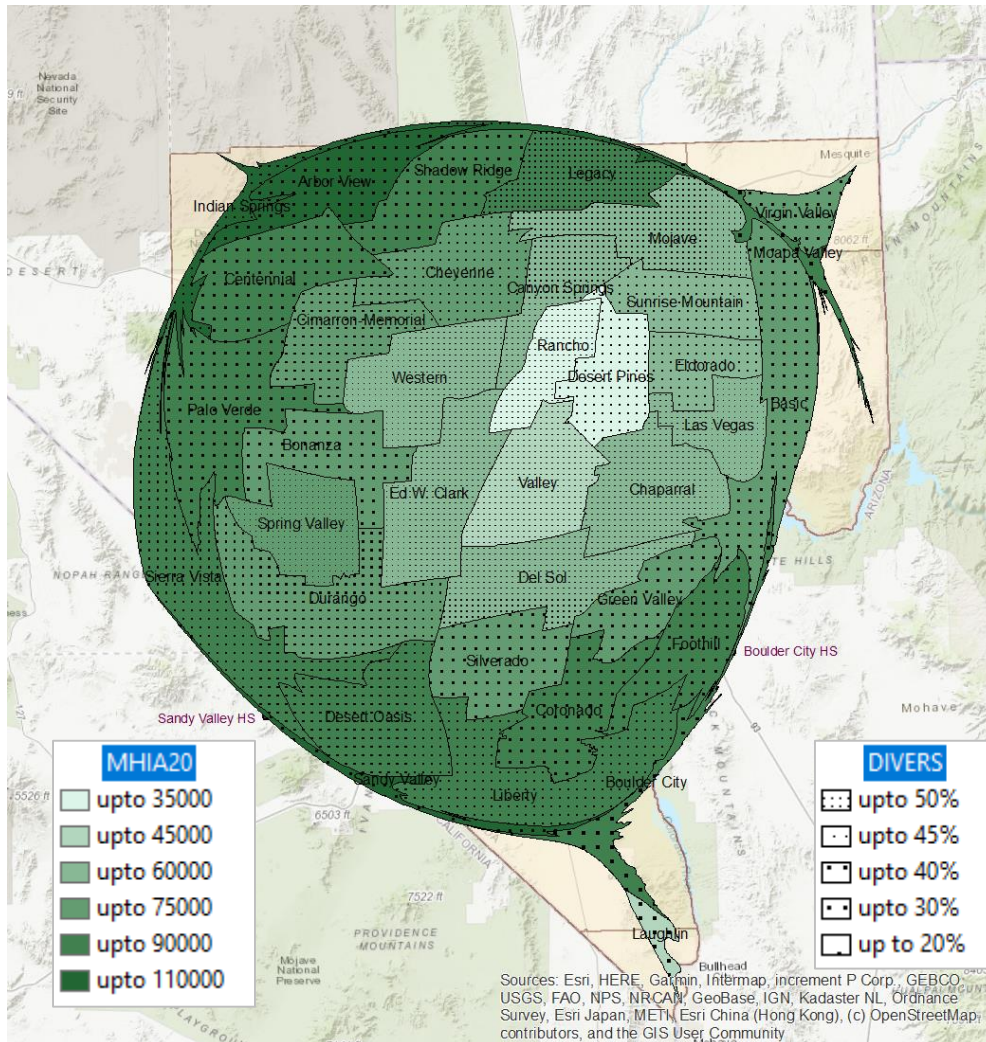
Figure 4: Cartogram of CCSD Attendance Zones sized by total population



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

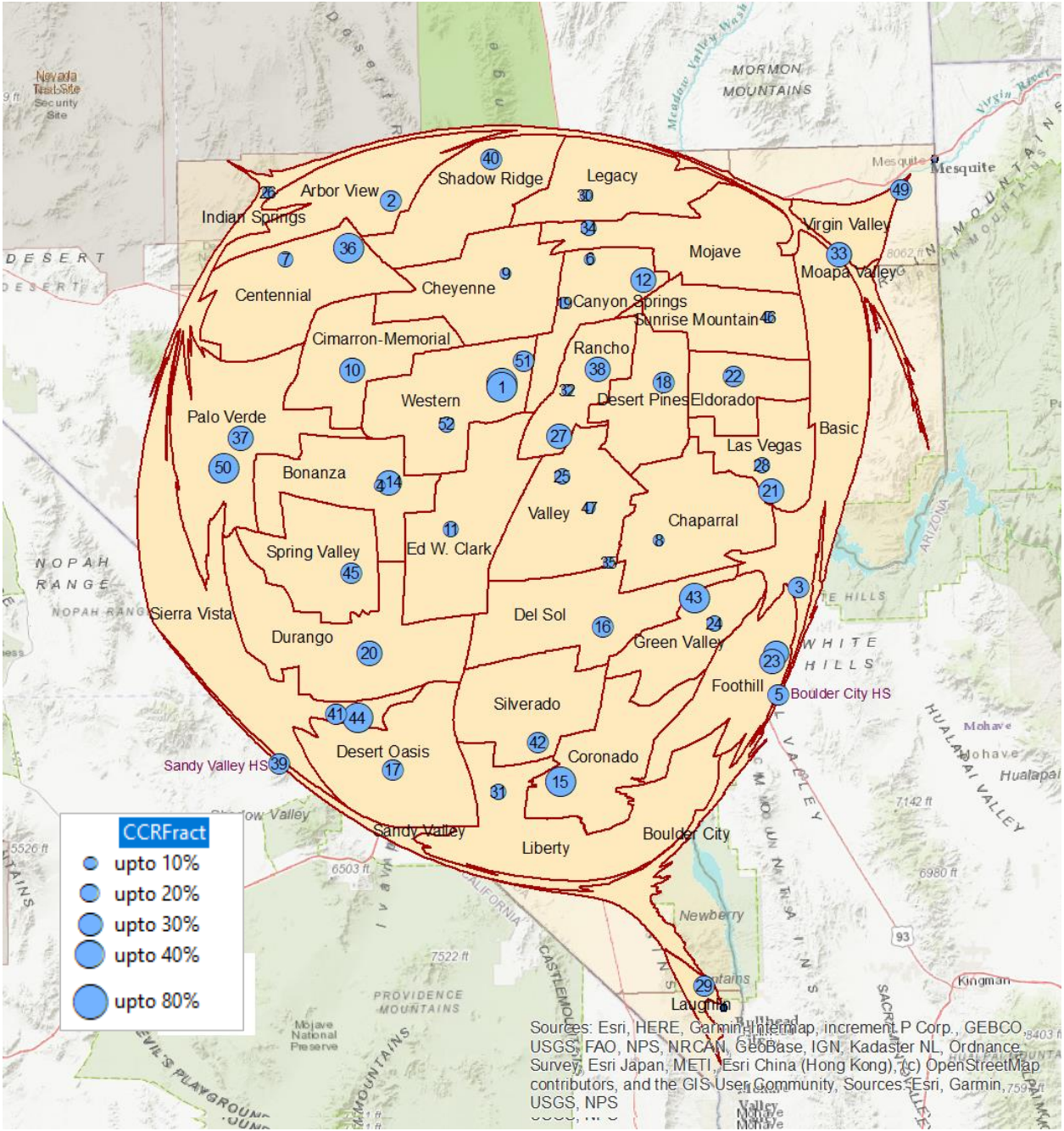


CCSD deals with these realities every day. Over half of its metro schools have Title I designations, i.e., receiving supplemental Federal financial support for students, teachers, and administration. Within the Title I schools, nine have Magnet designations, specializing, often practical, subjects beyond 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	<i>Indian Springs High School</i>		<i>Title I</i>	<i>Indian Springs</i>
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	<i>Laughlin Junior/ Senior High School</i>		<i>Title I</i>	<i>Laughlin</i>
31	Legacy High School		Title I	Legacy
32	Liberty High School			Liberty
33	Mission High School		Title I	Rancho
34	<i>Moapa Valley High School</i>			<i>Moapa Valley</i>
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	<i>Sandy Valley Junior/ Senior High School</i>		<i>Title I</i>	<i>Sandy Valley</i>
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)

Variables	(1)	(2)	(3)	(4)
	Non-CTE Completers		CTE Completers	
	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

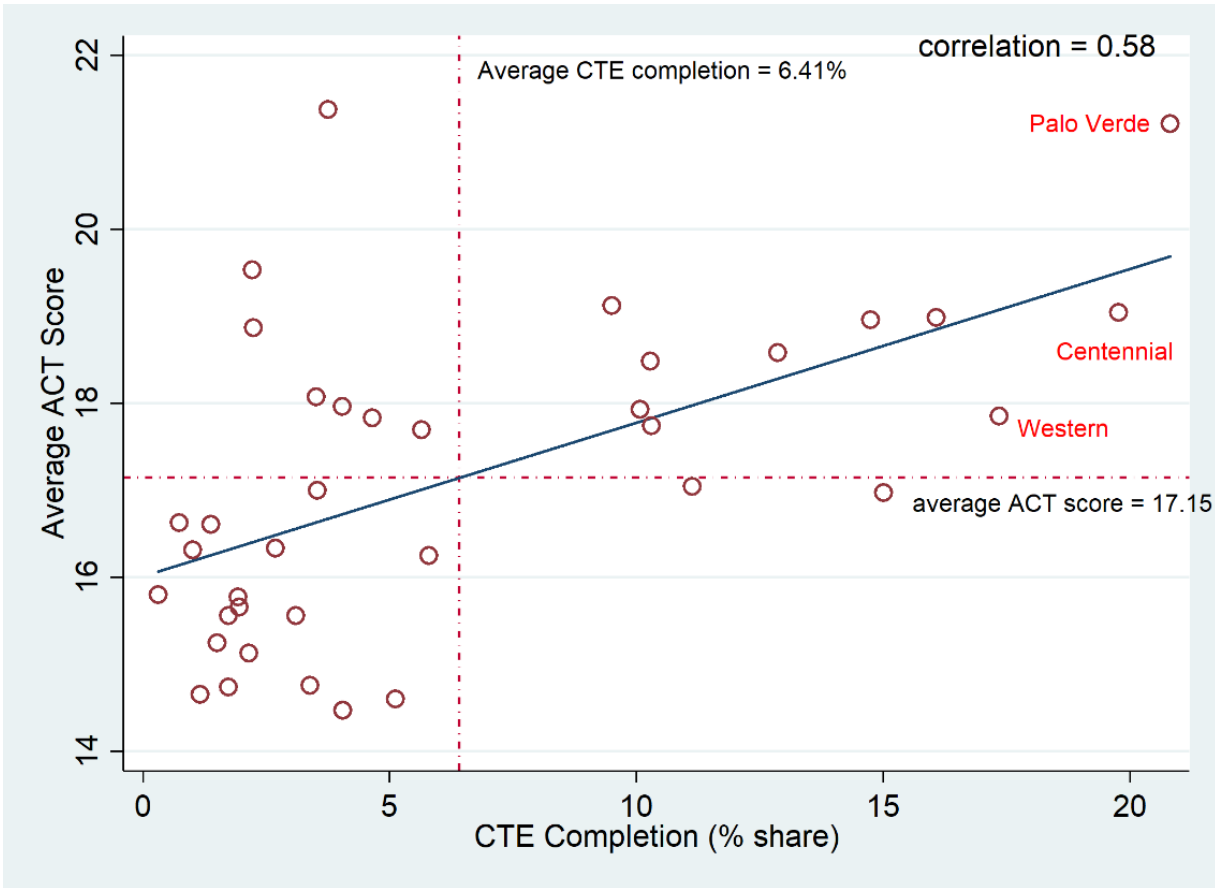
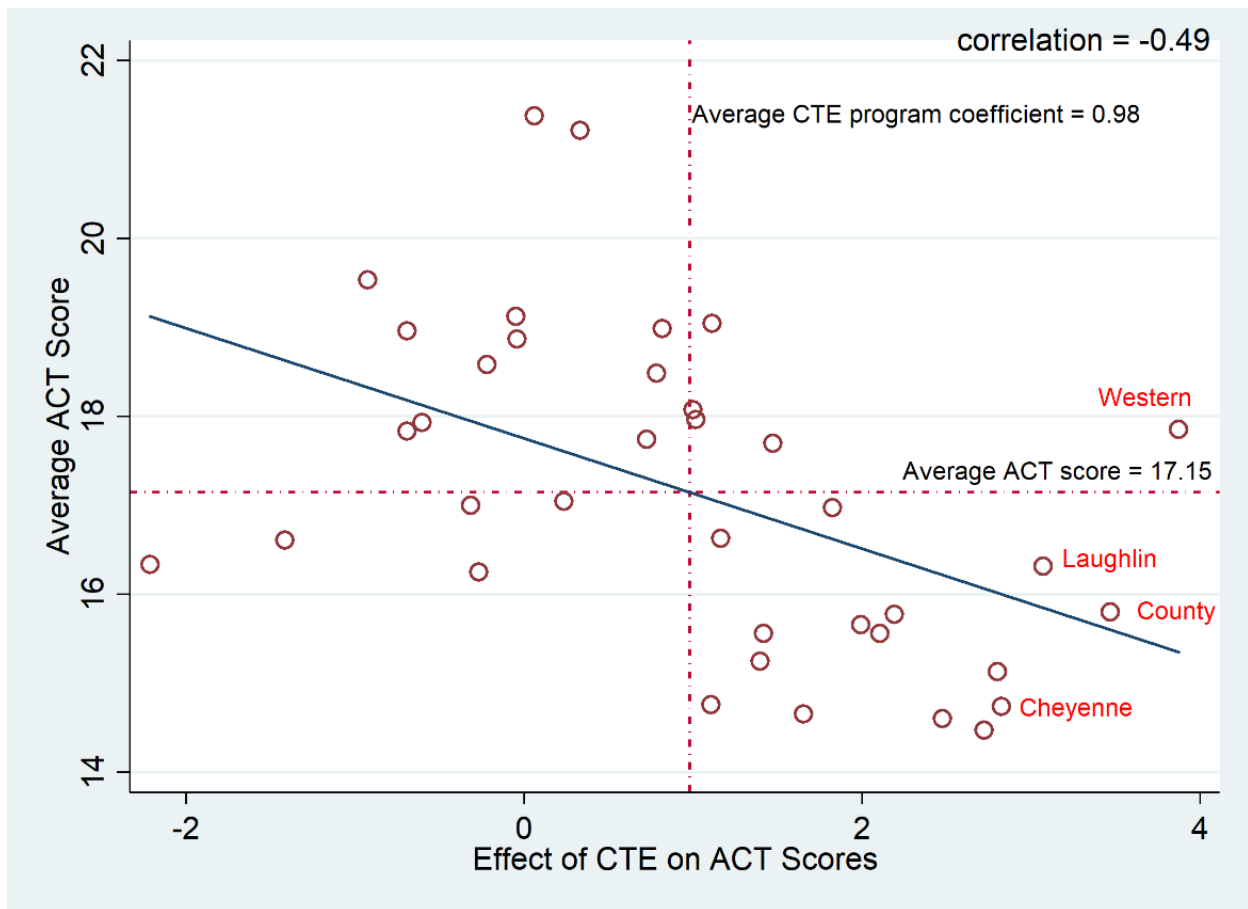


Figure 8 shows the relationship between average ACT score and the estimated effect (regression coefficient) of the CTE program on ACT scores in school zones. There is a moderate, negative correlation (-0.49) between the variables. Those school zones with low average ACT scores tend to have a bigger impact 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)

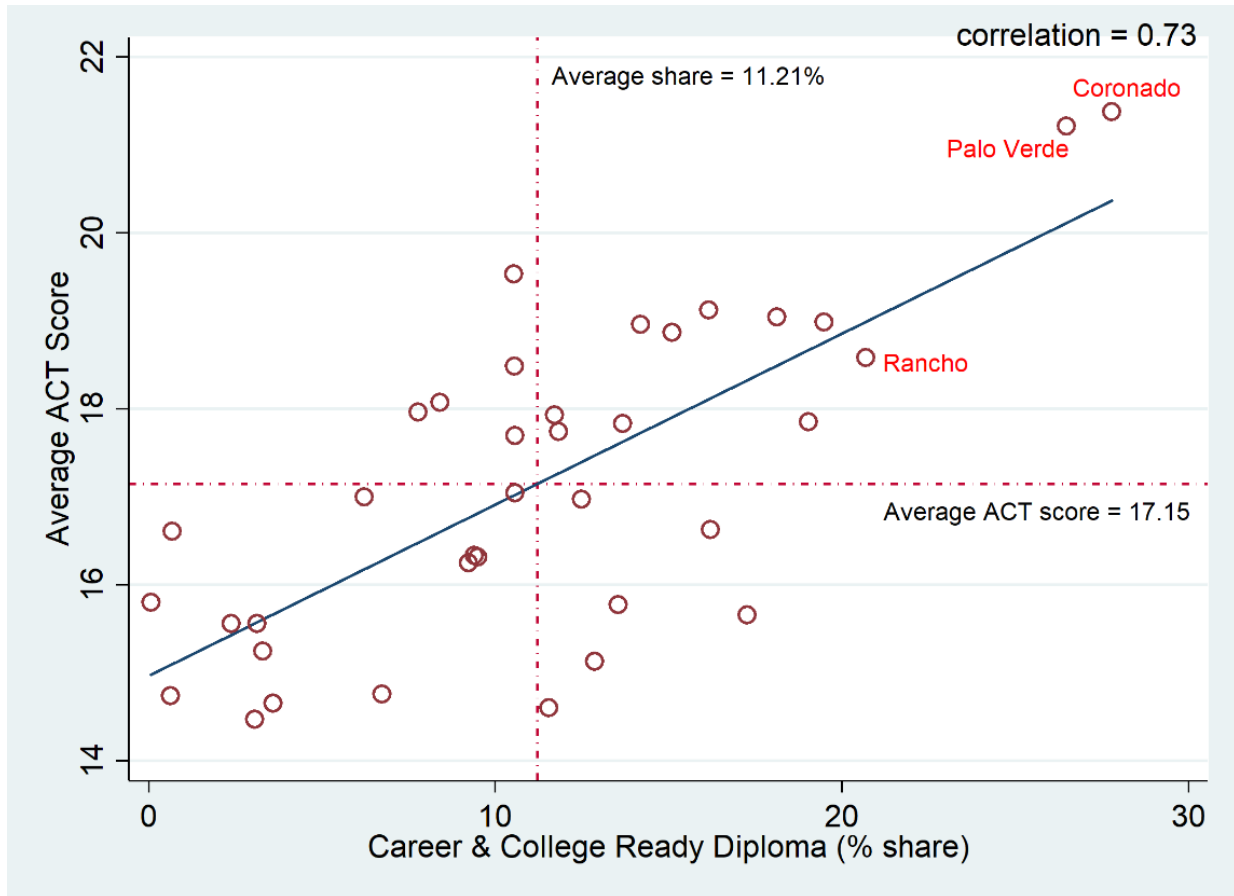
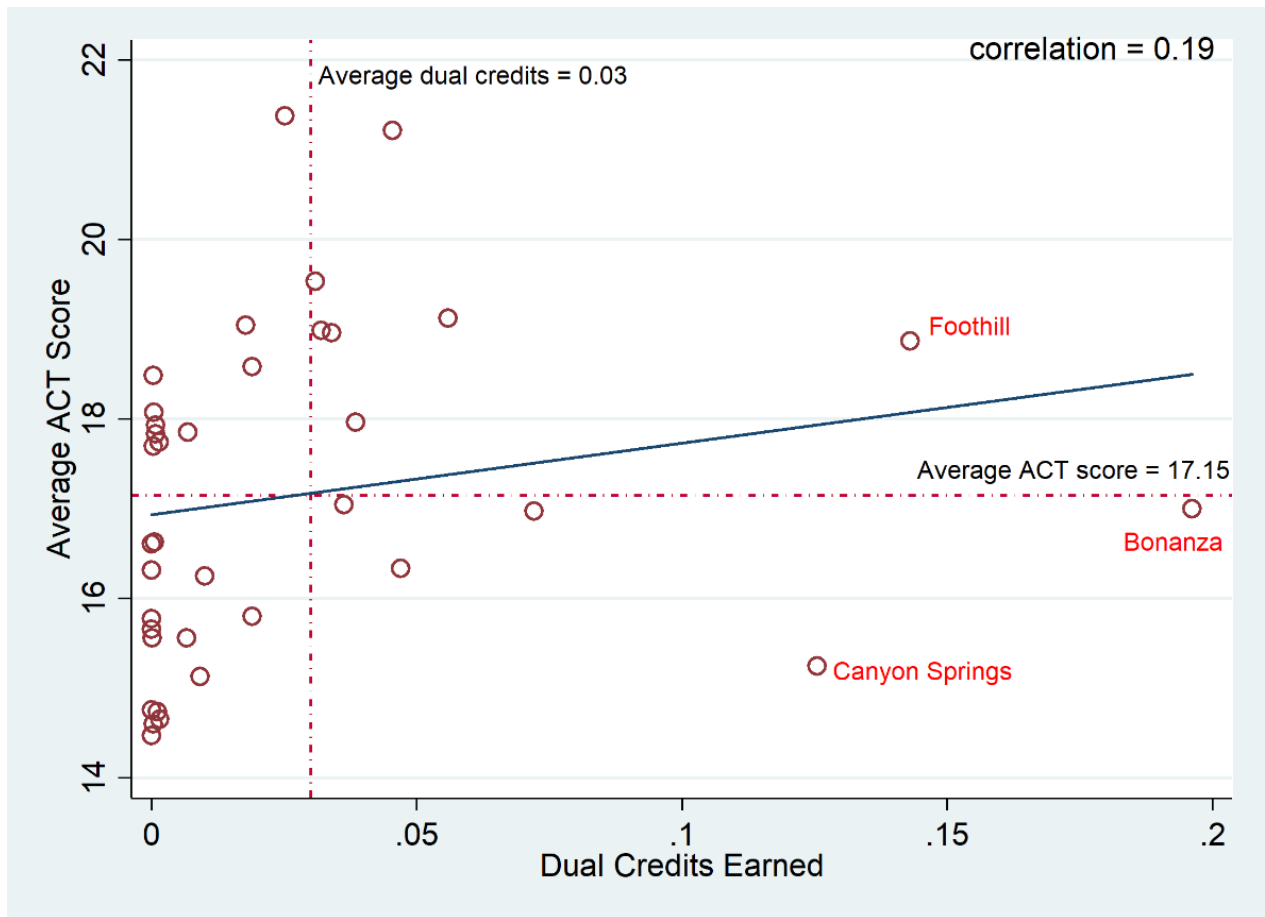


Figure 10 shows that there is also a positive correlation between average ACT score and average dual enrollment credits earned in school zones, but the correlation is much lower at 0.19 as it is also indicated by a relatively flat fitted line. The average number of dual credits earned in school

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

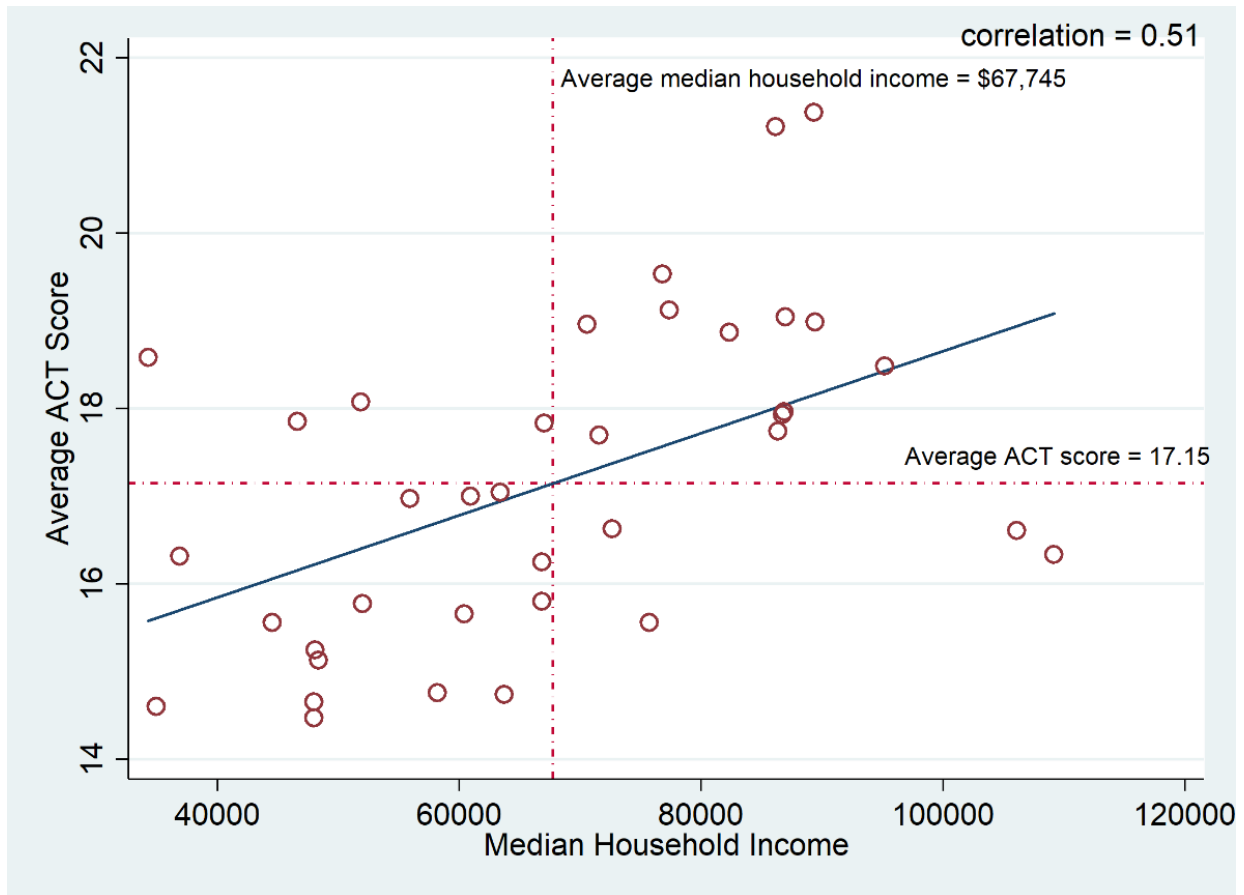


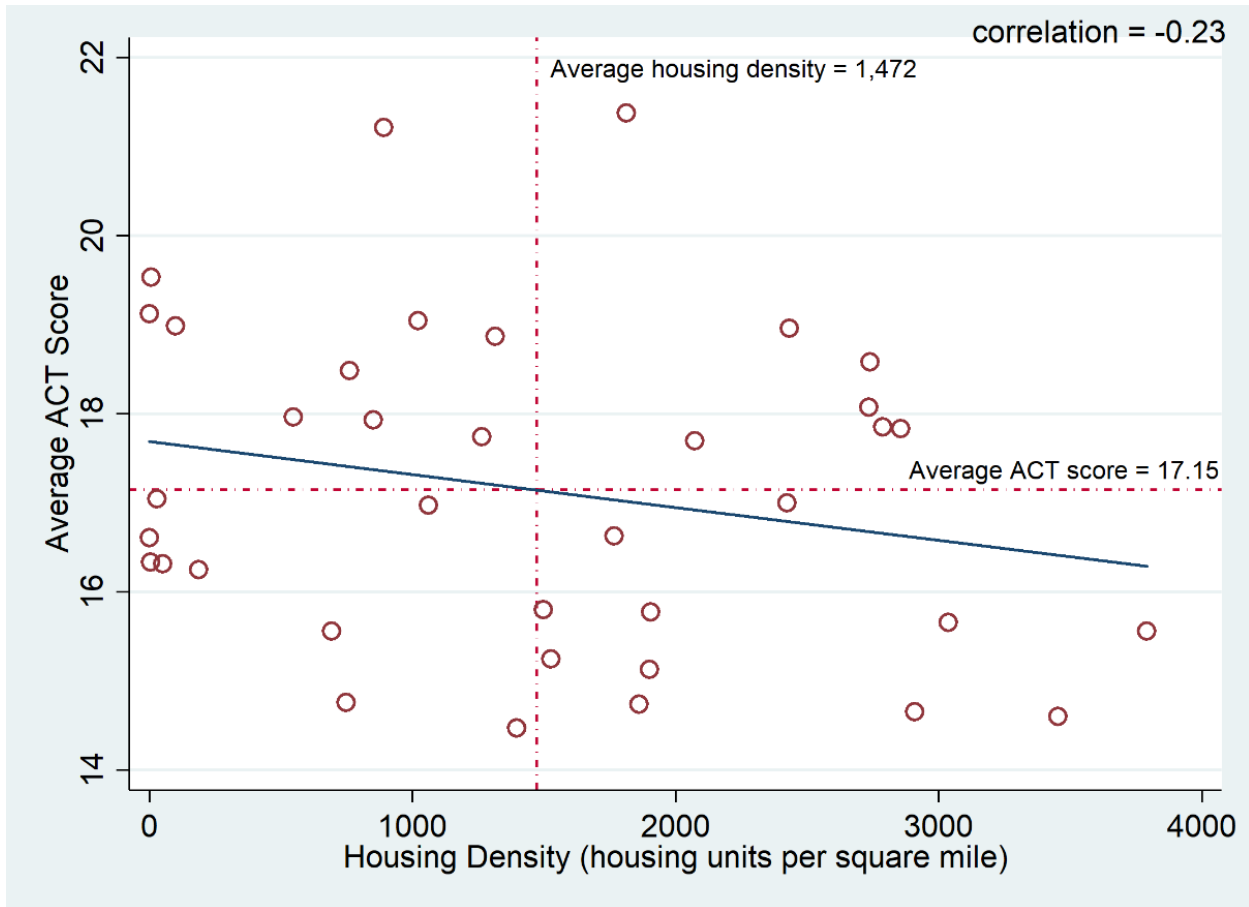
Figure 12 shows a negative relationship with a correlation of -0.29 , indicating that students residing in school zones that are more populous are more likely to score lower on their ACT scores. For example, students residing in more populous school zones, such as Desert Pines, Chaparral, Rancho, Western, 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*** (0.0464)	0.858*** (0.0462)	2.513*** (0.0987)	2.377*** (0.0981)
Diploma Type (College & Career Ready = 1)	4.480*** (0.0415)	4.262*** (0.0398)	4.941*** (0.0484)	4.758*** (0.0457)
Dual Credits Earned	1.142*** (0.0457)	1.148*** (0.0441)	1.088*** (0.0493)	1.113*** (0.0479)
Nonwhite Student	-2.082*** (0.0319)	-1.584*** (0.0332)	-2.155*** (0.0347)	-1.623*** (0.0357)
Female Student	-0.125*** (0.0248)	-0.140*** (0.0239)	0.0441* (0.0261)	0.0200 (0.0252)
Received Individualized Education	-2.979*** (0.0322)	-2.847*** (0.0322)	-2.943*** (0.0321)	-2.809*** (0.0321)
Need English Language Support	-2.846*** (0.0246)	-2.547*** (0.0257)	-2.759*** (0.0250)	-2.465*** (0.0261)
CTE x Diploma Type			-2.002*** (0.0914)	-2.072*** (0.0892)
CTE x Dual Credits Earned			0.224** (0.113)	0.0697 (0.112)
CTE x Nonwhite Student			0.734*** (0.0873)	0.492*** (0.0862)
CTE x Female Student			-1.366*** (0.0780)	-1.293*** (0.0764)
CTE x Individualized Education			0.397 (0.269)	0.367 (0.266)
CTE x Need English Support			-1.439*** (0.182)	-1.427*** (0.179)
Constant	18.59*** (0.0323)	17.08*** (0.256)	18.49*** (0.0348)	16.91*** (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*** (0.0464)	1.175*** (0.0460)	2.513*** (0.0987)	3.375*** (0.352)
Diploma Type (College & Career Ready = 1)	4.480*** (0.0415)	4.435*** (0.0407)	4.941*** (0.0484)	4.886*** (0.0472)
Dual Credits Earned	1.142*** (0.0457)	1.182*** (0.0448)	1.088*** (0.0493)	1.138*** (0.0482)
Nonwhite Student	-2.082*** (0.0319)	-1.777*** (0.0331)	-2.155*** (0.0347)	-1.810*** (0.0360)
Female Student	-0.125*** (0.0248)	-0.109*** (0.0245)	0.0441* (0.0261)	0.0602** (0.0258)
Received Individualized Education	-2.979*** (0.0322)	-2.980*** (0.0322)	-2.943*** (0.0321)	-2.949*** (0.0321)
Need English Language Support	-2.846*** (0.0246)	-2.602*** (0.0254)	-2.759*** (0.0250)	-2.489*** (0.0259)
Population per Square Mile		-0.000262*** (2.02e-05)		-0.000286*** (2.06e-05)
Total Housing Units per square mile		0.000896*** (4.46e-05)		0.000920*** (4.53e-05)
Median Household Income		3.37e-05*** (1.08e-06)		3.55e-05*** (1.14e-06)
CTE x Diploma Type			-2.002*** (0.0914)	-1.959*** (0.0910)
CTE x Dual Credits Earned			0.224** (0.113)	0.216* (0.113)
CTE x Nonwhite Student			0.734*** (0.0873)	0.511*** (0.0901)
CTE x Female Student			-1.366*** (0.0780)	-1.355*** (0.0778)
CTE x Individualized Education			0.397 (0.269)	0.411 (0.270)
CTE x Need English Support			-1.439*** (0.182)	-1.567*** (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*** (0.0323)	15.69*** (0.105)	18.49*** (0.0348)	15.51*** (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*** (0.0780)	0.347*** (0.0779)	-0.217 (0.190)	-0.0789 (0.189)
Diploma Type (College & Career Ready = 1)	2.947*** (0.0775)	2.618*** (0.0790)	2.936*** (0.0942)	2.575*** (0.0945)
Dual Credits Earned	1.327*** (0.102)	1.371*** (0.104)	1.312*** (0.116)	1.439*** (0.118)
Nonwhite Student	-1.412*** (0.0803)	-1.235*** (0.0832)	-1.467*** (0.0997)	-1.281*** (0.100)
Female Student	-1.293*** (0.0743)	-1.150*** (0.0725)	-1.541*** (0.0913)	-1.383*** (0.0892)
Received Individualized Education	-2.547*** (0.266)	-2.305*** (0.265)	-2.713*** (0.333)	-2.424*** (0.327)
Need English Language Support	-4.196*** (0.180)	-3.686*** (0.178)	-4.068*** (0.217)	-3.521*** (0.217)
STEM CTE x Diploma Type			-0.0261 (0.165)	0.0641 (0.162)
STEM CTE x Dual Credits Earned			0.102 (0.238)	-0.269 (0.240)
STEM CTE x Nonwhite Student			0.164 (0.168)	0.126 (0.164)
STEM CTE x Female Student			0.709*** (0.157)	0.657*** (0.154)
STEM CTE x Individualized Education			0.466 (0.551)	0.340 (0.549)
STEM CTE x Need English Support			-0.334 (0.386)	-0.444 (0.374)
Constant	20.89*** (0.0988)	21.41*** (1.670)	21.09*** (0.118)	21.47*** (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*** (0.0905)	1.060*** (0.0900)	1.839*** (0.0978)	1.686*** (0.0988)
Diploma Type (College & Career Ready = 1)	4.034*** (0.0829)	3.965*** (0.0792)	4.052*** (0.0880)	3.940*** (0.0846)
Dual Credits Earned	1.478*** (0.0586)	1.462*** (0.0579)	1.969 (3.174)	2.012 (3.216)
Nonwhite Student	-2.082*** (0.0651)	-1.550*** (0.0675)	-1.865*** (0.0763)	-1.446*** (0.0792)
Female Student	-0.114** (0.0518)	-0.144*** (0.0498)	-0.314*** (0.0577)	-0.337*** (0.0559)
Received Individualized Education	-3.079*** (0.0712)	-2.931*** (0.0713)	-2.673*** (0.0706)	-2.557*** (0.0708)
Need English Language Support	-3.019*** (0.0522)	-2.717*** (0.0556)	-2.449*** (0.0572)	-2.238*** (0.0601)
Constant	18.59*** (0.0665)	16.98*** (0.453)	17.83*** (0.0763)	15.90*** (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 students⁷ 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 graduates⁸ 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 degrees⁹ 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).¹⁰The 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 Groups¹¹. 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 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 occupations¹⁴ 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
Dietitians 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:

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

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
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
Cheyenne High School	Transportation, Distribution, and Logistics	1	1
	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
Cimarron Memorial High School	Law, Public Safety, Corrections and Security	1	
	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
	Business, Management and Administration	Video Production	Completer	361
			Not Completer	1492
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
	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
	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