MARICOPA
COMMUNITY COLLEGES

ENVIRONMENTAL SCAN STUDY

January 2021

SMITHGROUP

OVERVIEW OF ENVIRONMENTAL SCAN PROCESS & METHODOLOGY

INTRODUCTION

During the spring of 2020, Maricopa Community College District (MCCCD) contracted SmithGroup to develop a district-wide comprehensive facility plan for their colleges. As part of that project, SmithGroup was asked to develop a comprehensive environmental scanning document to support future planning across the district. The Maricopa Community College District was founded in 1920 with 53 students. Today the Maricopa County Community College District serves more than a quarter of a million students each year. The Maricopa County Community College District is the largest single provider of higher education in Arizona.

To provide MCCCD with a broad set of comprehensive data for college leadership to develop future planning documents, SmithGroup conducted in-depth research on a wide variety of topics. The data elements analyzed in the environmental scan have been selected based upon over 30 years of experience that SmithGroup has in assisting higher education institutions in planning services. The environmental scan was not designed to analyze every single piece of data available, but rather specific data elements that have been shown over time to provide colleges with reliable indicators from which to plan future activities.

ENVIRONMENTAL SCANNING INTRODUCTION & METHODOLOGY

Environmental scanning is a method of systematically collecting and analyzing trends, issues, and events that may externally impact higher education institutions. The process of environmental scanning helps us to identify possible changes that may affect the way we do business in the world and how to address those changes strategically. The world around us is constantly changing, bringing us challenges and opportunities that we must address to function efficiently and effectively in the 21st century and beyond.

This process aims to alert constituents within the institution to potentially significant external changes before they crystallize, so that decision-makers have sufficient time to react to the change. In many instances, the institution can be proactive and design marketing, recruitment, and curricular strategies to capitalize on changing trends. The environmental scan is usually the first step in the strategic/academic/facility planning process and is considered an essential part of the master planning process. The first phase in conducting an environmental scan requires baseline information: data to be assembled includes detailed analysis from primary and secondary sources at the national, state, regional, and local levels. Major units of analysis will include demography, technology, economics, political issues, and workforce.

Data needed to answer the questions posed in identifying student markets and program needs is typically in state and local agencies' hands. First, the consultants will scan secondary data sources at the national level such as the U.S. Census Bureau, the U.S. Department of Labor and the Bureau of Labor Statistics, the U.S. Department of Commerce, and the Bureau of Economic Analysis as well as several websites related to higher education trends and issues. At the state level, the State of Arizona Department of Workforce Services contains valuable data on employment and population trends and occupational projections.

Because of the constant threat of change, it is vital for an educational institution to stay abreast of environmental changes that may affect their future. For institutions to stay relevant, it is necessary to establish a systematic method of collecting information regarding external influences.

Environmental scanning is an essential component of planning in today's changing world. Educational institutions, no less than corporations or governments, must understand what is happening in the environment in which they exist, be able to analyze it, and even predict it. Environmental scanning is wider in scope than traditional data collection because it is based on the assumption that major impacts on the college may come from unsuspected sources and unpredictable occurrences.

Over the last 20 years, environmental scanning has been a critical function for higher education as part of an institutional planning process. Environmental scanning enables institutions to become aware more easily of external occurrences that affect the future, for which the college may prepare strategically. In today's world of uncertainty and shrinking economic resources, environmental scanning is a must.

MARICOPA COMMUNITY COLLEGES

ENVIRONMENTAL SCAN STUDY

CONTENTS

CHAPTER 1 DEMOGRAPHIC TRENDS

FOCUS AREA:

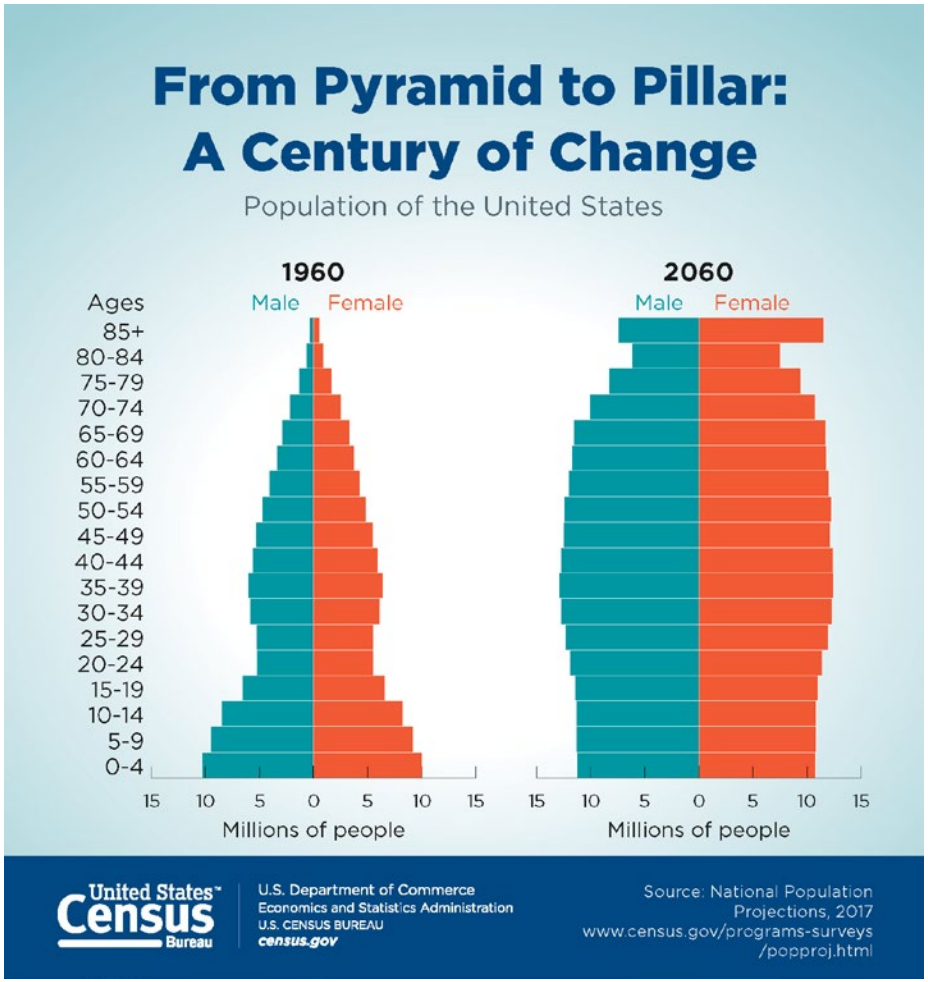
One of the most important components of an environmental scan is the data related to demographic trends or demography. Demography is the study of the growth, structure, and movement of human populations. It focuses on enumerations (censuses), which take stock of a population at a moment in time, and other key demographic events—births, deaths, marriages, and migratory movements.

The study of demography is important as it allows us to analyze how our population changes over time. This is important to the environmental scan as it enables us to understand and predict how changes in the population will impact the institution in the future. One of the most difficult tasks for educational planners is anticipating and planning for the number of students coming to the institution. The impact of student numbers affects almost every operational facet of an institution. By analyzing and understanding current and future population changes, institutions can forecast potential enrollment fluctuations that may impact the college over time. The remainder of this chapter will examine a wide variety of population data that will shape MCCCD over the next 5-10 years.

QUESTIONS FOR THIS FOCUS AREA:

- How will population trends over the next ten years impact enrollment at your campus?
- The Hispanic population projection indicates significant growth for at least the next 30 years. What strategies can be put in place to attract this population to your campus?

FIGURE 1.1 | UNITED STATES POPULATION



NATIONAL POPULATION TRENDS

The population of the United States continues to see steady growth. As of June 1, 2020, the United State's total population obtained from the U.S. Census Bureau is approximately 329,706, 268 people. The current population growth is being driven by a birth every 9 seconds and a death every 12 seconds, resulting in a net gain of one person every 19 seconds. While the national population may seem to have little relevance to Arizona and, more specifically, in the Phoenix area, many of the components of the national population growth operate in tandem with population growth at the regional and local levels.

A couple of population trends at the national level are worth examining to see if a similar trend exists or will develop in Arizona or the greater Phoenix area. The first two trends are somewhat related in that they both are components of our aging population. Figure 1.1 compares two population pyramids 100 years apart. What is striking about the comparison is the impact that longevity is going to play in changing the makeup of our population. What used to be called a population pyramid, by 2060, will represent more of a pillar in shape because of the longevity of older cohorts of the population.

Closely related to this concept of longevity is a trend that is developing where for the first time in U.S. history, older adults are projected to outnumber children by 2035. As depicted in Figure 1.2, as the older age cohorts live longer and the younger cohorts decrease in size around 2035, the population of adults 65+ will be larger than the age cohort of children less than 18 years old. Some of the effects of this population change will begin to be noticeable within the next five years. Since the age cohort of people that are 18+ is a critical segment for higher education institutions, it will be important for colleges to monitor locally this changing demographic. There will be parts of the country where this will happen sooner than in other parts. It would be a logical assumption that this will happen in geographic locations that exist in warmer climates sooner as more and more older Americans seek shelter from the colder climates.

FIGURE 1.2 | CHILDREN VS. ADULTS 65+

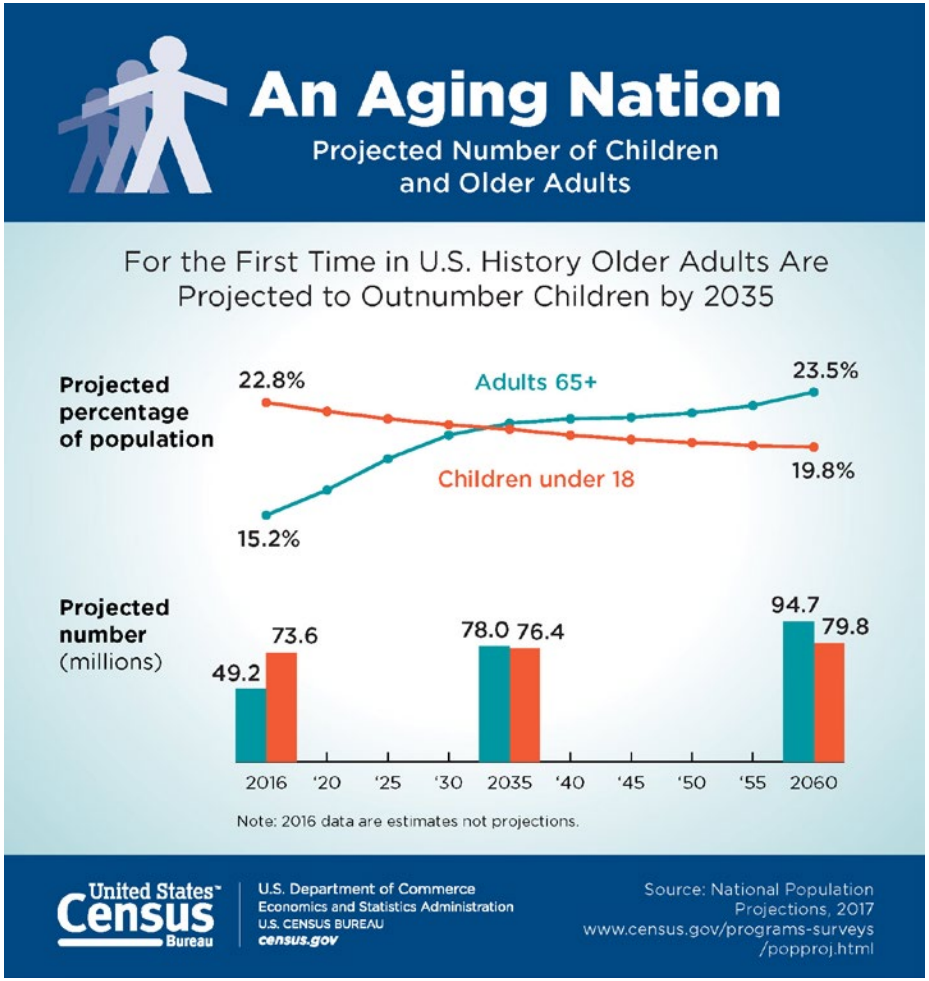
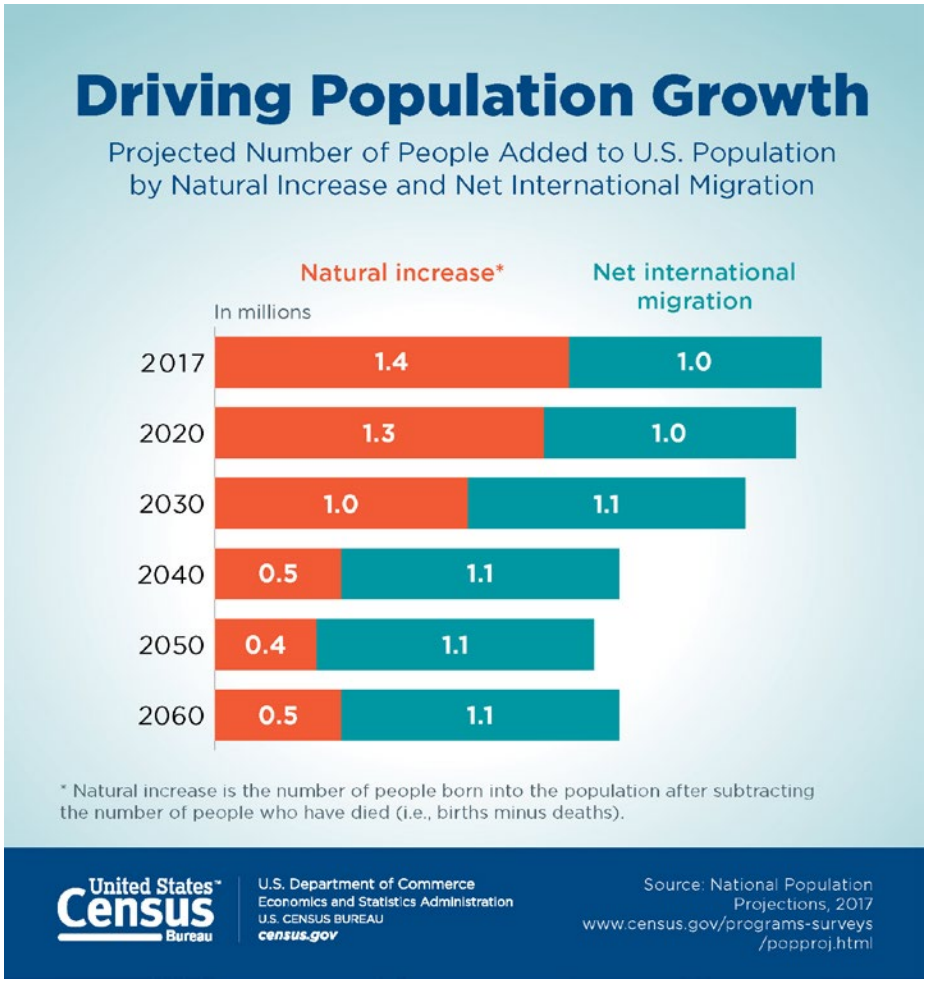


FIGURE 1.3 | PROJECT NUMBER OF PEOPLE ADDED TO U.S. POPULATION



The last national trend that will likely impact higher education institutions at the regional level through population growth will be underlying factors that comprise the actual population increase. For at least the last 50 years, much of this country's population growth has come from natural increases in population components. The net natural increase in population growth comes from two components: (1) the number of births; and (2) the number of deaths. Using current estimates, by around 2030, the population growth in this country will be driven more by international migration than natural increases. By 2060, net international migration will more than double what the natural population increase is in the U.S.

STATE POPULATION TRENDS

As of January 2020, the population of Arizona is approximately 7,286,100. Current population projections indicate that Arizona's overall population will grow on average by a little over 1% per year until at least 2050. Based upon those projections, by 2030, Arizona's population will be 8,284,900, an increase of 998,800 people. By 2050, the Arizona population will be approximately 10,096,200, a total increase from 2020 of 2,810,100, an overall increase of 38.6%.

An important component of the overall state population growth will be the population increase in Maricopa County. Over the next ten years, Maricopa County is expected to grow 15.1% or approximately 670,800 people. By 2030, Maricopa County alone will make up 61.7% of the state's population.

TABLE 1.1 | ARIZONA STATE POPULATION ESTIMATES

YEAR	ARIZONA	INCREASE	% INCREASE
2020	7,286,100		
2025	7,791,800	505,700	6.94%
2030	8,284,900	493,100	6.33%
2035	8,777,600	492,700	5.95%
2040	9,247,200	469,600	5.35%
2045	9,682,300	435,100	4.71%
2050	10,096,200	413,900	4.27%

Source: Arizona Department of Administration, Office of Employment & Population Statistics, 5/6/2020

TABLE 1.2 | ARIZONA COUNTY POPULATION GROWTH

YEAR	ARIZONA	MARICOPA COUNTY	GROWTH	% INCREASE
2020	7,286,100	4,436,900		
2025	7,791,800	4,780,600	343,700	7.7%
2030	8,284,900	5,107,700	670,800	15.1%
2050	10,096,200	6,196,000	1,759,100	34.4%

Source: Arizona Department of Administration, Office of Employment & Population Statistics, 5/6/2020

PHOENIX REGIONAL POPULATION TRENDS

While Maricopa County is the major population component in the Phoenix regional area, it is also worth noting that Pinal County is currently experiencing some of the highest population growth in the state and is projected to do so until at least 2050 and beyond. Maricopa County is now ranked as the fourth-largest county by population in the country, with 4,436,900 people overall. Maricopa County is projected to grow by approximately 670,800 people from 2020-2030 for a total population of 5,107,700, an increase of 15.1%.

The remainder of this chapter will examine specific population components in Maricopa County related to this population growth. The data will also highlight potential opportunities for MCCCD to explore to better understand how they can capitalize on the projected population growth in the region.

While looking at general population growth provides valuable information about whether the potential pool for future enrollment exists, it is generally more helpful to examine specific age groups of the population to understand what impact the growth will have on higher education. Since most students who attend a community college are generally graduating from high school or in the years just after graduation, it is most helpful to examine age groups from 15-19 and 20-29.

TABLE 1.3 | MARICOPA COUNTY POPULATION PROJECTIONS BY AGE COHORTS

	AGE COHORTS											
YEAR	**0-4**	**5-9**	**10-14**	**15-19**	**20-29**	**30-39**	**40-49**	**50-59**	**60-69**	**70-79**	**80+**	**Total**
2020	268,714	284,147	303,432	321,701	642,911	588,408	559,514	540,317	466,800	305,842	155,122	4,436,908
2025	283,092	279,315	298,897	338,652	691,265	629,865	594,543	562,397	539,068	372,605	190,931	4,780,632
2030	301,175	293,922	293,780	333,430	724,534	694,562	621,356	587,485	571,638	438,773	247,094	5,107,747
2035	312,308	312,592	309,114	328,433	732,638	740,348	663,227	623,223	593,202	504,217	304,053	5,423,356
2040	315,665	323,790	328,261	344,359	722,758	773,797	728,183	650,625	617,771	534,490	372,318	5,712,017
2045	315,417	326,457	339,092	363,825	732,181	785,369	772,337	689,434	650,859	554,036	437,883	5,966,889
2050	316,454	325,683	341,069	374,303	766,802	777,153	807,336	751,523	674,328	574,885	486,486	6,196,023

Source: Arizona Office of Economic Opportunity, 5/6/2020

Table 1.3 provides population projection data on Maricopa County from 2020 to 2050. Overall, all the age cohorts indicate gradual increases over the next 30 years. Two exceptions to this are noted in the 5-9 and 10-14 age cohorts starting in 2020. There is a slight decline in these two age groups from 2020 to 2025. Over time this slight decline slowly impacts the age cohorts as it chronologically advances in time. In the 15-19 age cohort, this decline shows up between 2025 and 2035 and in the 20-29 age cohort shows up between 2035 and 2040. In general, the population decline is only mildly significant; it should nonetheless be anticipated as the district makes long-range plans starting in 2025 and having some impact until 2040.

Overall, the population growth in the 15-19 and 20-29 age cohort holds significant opportunity for growth in enrollment for the district. As shown in Table 1.4, from 2020 to 2030, the 15-19 age cohort is projected to grow by 5.3% in Maricopa County. Also encouraging is the projected population growth in the 20-29 age cohort. From 2020 to 2030, the 20-29 age cohort is projected to increase by 7.5% in Maricopa County.

TABLE 1.4 | GROWTH OF TRADITIONAL COLLEGE AGE POPULATION

	PERCENT CHANGE 2020-2030	
COUNTY	**15-19 Years**	**20-29 Years**
Maricopa	5.3%	7.5%

Source: Arizona Office of Economic Opportunity, 5/6/2020

RACE/ETHNICITY COMPARISONS

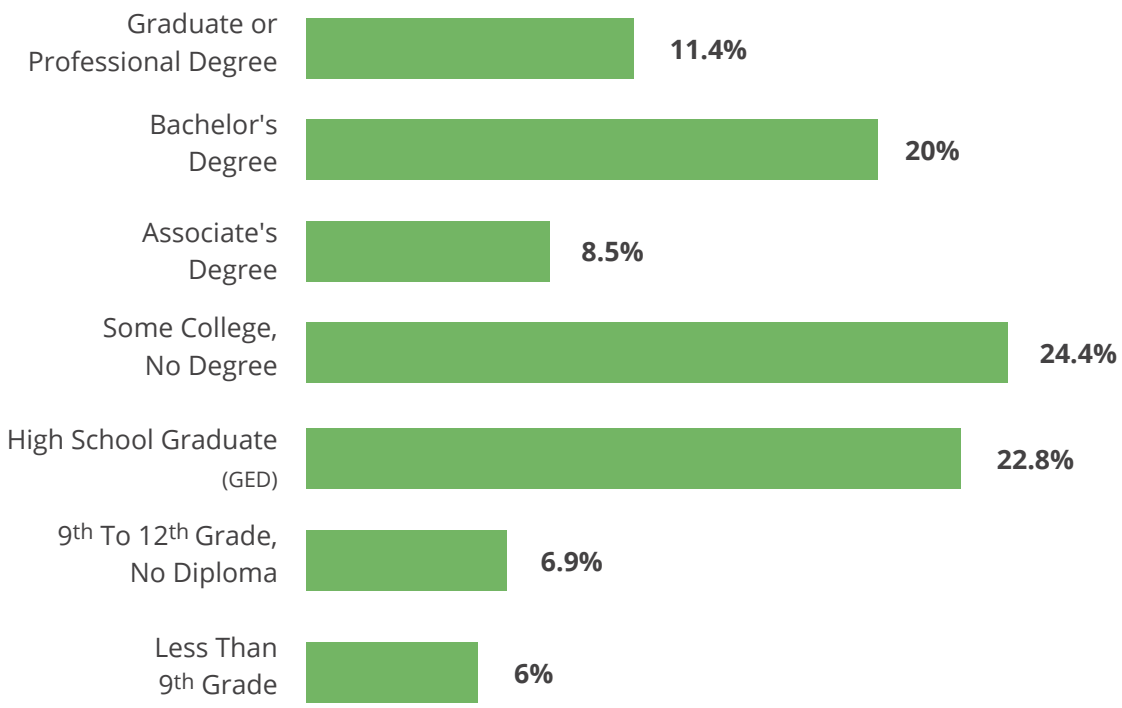
Data was also examined to better understand the race/ethnicity changes that will occur in Maricopa County. Table 1.5 provides population projections based upon race for Maricopa County. The data indicates that Black, Native American, Asian and other races remain fairly constant in their overall population composition. The white population shows a steady decrease for each year from 2020-2050. In contrast, the Hispanic population indicates steady growth during the same time period.

TABLE 1.5 | MARICOPA COUNTY POPULATION PROJECTIONS BY RACE

YEAR	WHITE	BLACK	NATIVE AMERICAN	ASIAN	HISPANIC	OTHER
2020	54.2%	4.8%	1.7%	4.4%	32.8%	2.1%
2025	52.2%	4.9%	1.7%	4.8%	34.3%	2.1%
2030	50.3%	5.0%	1.7%	5.1%	35.7%	2.2%
2035	48.5%	5.1%	1.7%	5.4%	37.0%	2.3%
2040	46.9%	5.1%	1.7%	5.8%	38.2%	2.4%
2045	45.4%	5.2%	1.8%	6.1%	39.2%	2.4%
2050	44.1%	5.3%	1.8%	6.4%	40.0%	2.4%

Source: Arizona Office of Economic Opportunity, 5/6/2020

FIGURE 1.4 | MARICOPA COUNTY EDUCATIONAL ATTAINMENT



Source: U.S. Census Bureau: ACS; 2017; S1501

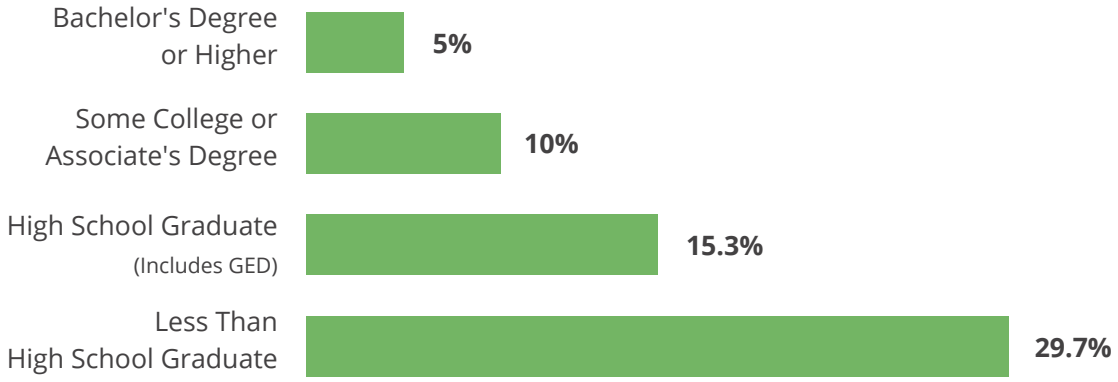
EDUCATIONAL ATTAINMENT OF THE POPULATION

Another key indicator of what opportunities will exist for MCCCD in the future can be determined by how educated the existing and projected population will be. Data was analyzed for Maricopa County about current educational attainment.

Figure 1.4 provides data on the educational attainment of Maricopa County by level of education. As shown in the chart, nearly 13% of the population does not have a high school diploma. This is usually a good indication of low economic mobility. This population would benefit from adult basic education and GED programs. Nearly 23% of the population has a high school diploma, which provides a good base for MCCCD to recruit from for certificate and associated degree programs. Another 24.4% of the county population has some college but no degree. This population generally yields significant opportunities for two-year colleges because they often consist of people who have attempted coursework at a 4-year institution and could not complete it. Often two-year colleges can help them complete degrees, which allows them to enter the workforce with a higher education level and generally better pay. In Maricopa County, 8.5% of the population has an associate's degree. As will be examined later in this report, the current workforce and occupational demand generally supports the need for an increased level of associates degrees in the Phoenix MSA.

As shown in Figure 1.5, the higher the level of education the population has, the less likely those residents will be in poverty. As shown in the chart, approximately 5% of the Maricopa County population is in poverty when possessing a bachelor's degree or higher. This contrasts with nearly 30% of Maricopa County population that is in poverty when they have less than a high school diploma.

FIGURE 1.5 | MARICOPA COUNTY POVERTY RATE BY EDUCATIONAL ATTAINMENT

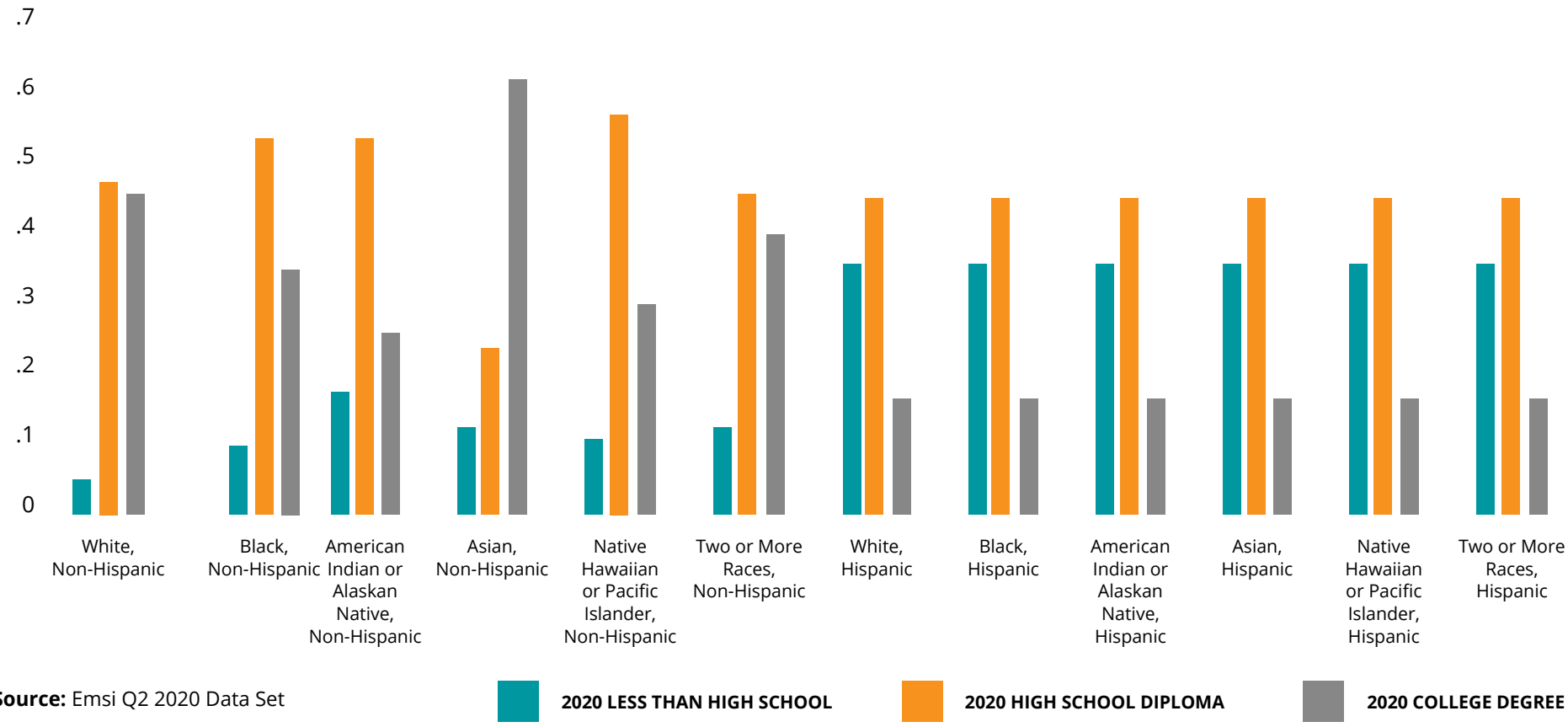


Source: U.S. Census Bureau: ACS; 2017; S1501

In Maricopa County, 35.7% of the population has a high school diploma or less, consisting of approximately 1,761,546 residents in the county. This represents a significant portion of the people that could benefit from additional education provided by MCCCD.

Figure 1.6 provides data on the educational attainment in Maricopa County based on race/ethnicity. As shown in the chart, there are significant educational attainment differences across some of the different demographic sectors. A high percentage of the Hispanic and Native American populations have not completed their high school diploma.

FIGURE 1.6 | MARICOPA COUNTY EDUCATIONAL ATTAINMENT BY RACE/ETHNICITY



Source: Emsi Q2 2020 Data Set

CHAPTER 2 GIS MAPPING & DATA VISUALIZATIONS

FOCUS AREA:

A geographic information system (GIS) is a framework for gathering, managing, and analyzing data. Rooted in the science of geography, GIS integrates many types of data. It analyzes spatial location and organizes layers of information into visualizations using maps and 3D scenes. With this unique capability, GIS reveals deeper insights into data, such as patterns, relationships, and situations—helping users make smarter decisions.

QUESTIONS FOR THIS FOCUS AREA:

- What does GIS data tell us about the students attending our college?
- How can we use data mapping to better inform the programs we offer and where they should be offered?
- What patterns exist in the GIS data that can help us attract more students to our college?

INTRODUCTION

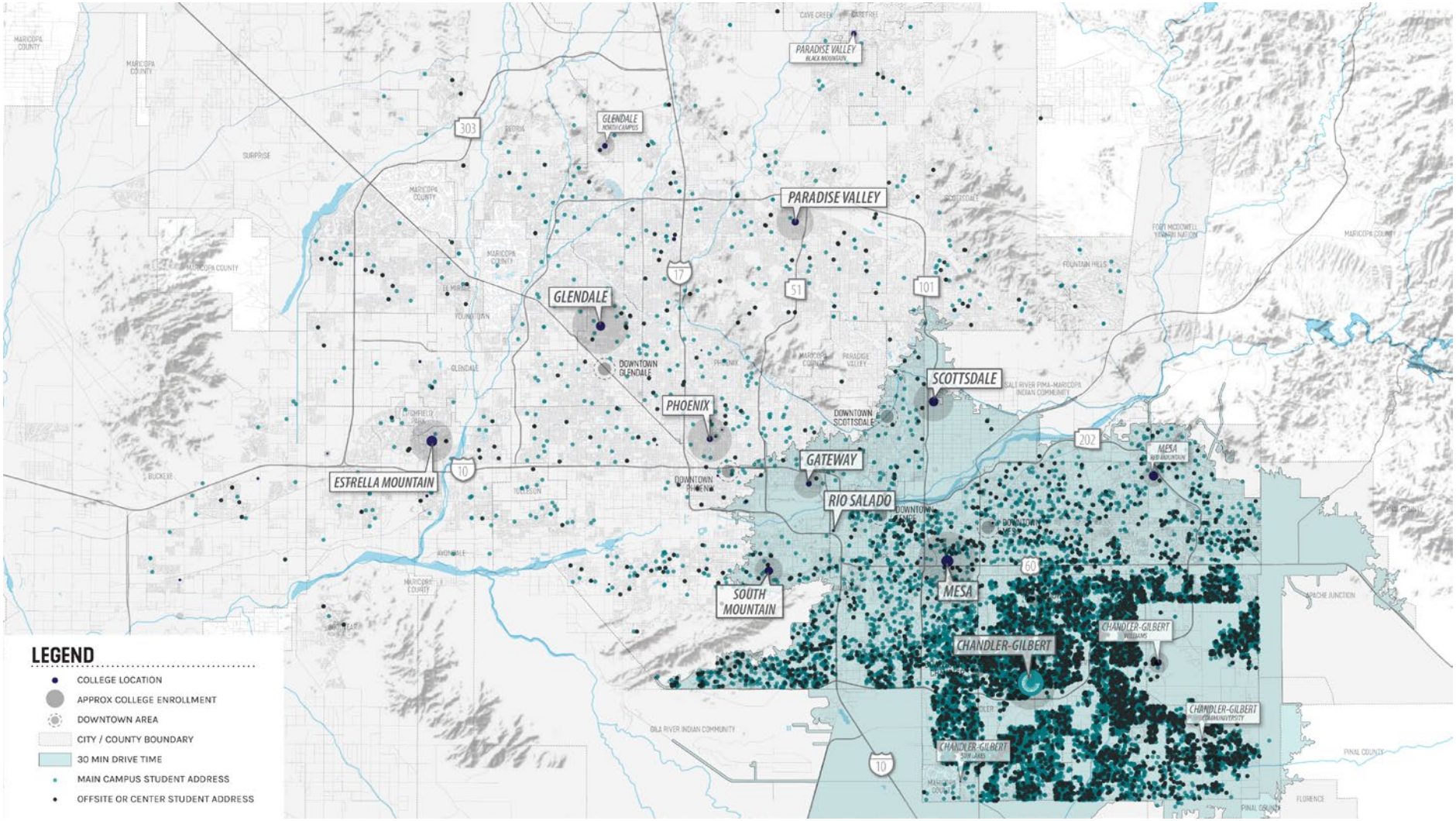
GIS benefits organizations of all sizes and in almost every business and industry. Higher education analysts are beginning to realize that making correct decisions about the location of programs is strategic to the institution's success, especially community colleges with multiple campus locations. GIS provides a very effective means of graphically conveying complex information, especially in reports and presentations where patterns are quickly and more clearly observed when viewing mapped data. GIS can be used as a tool in problem-solving and decision-making processes and for the visualization of data in a spatial environment. Geospatial data can be analyzed to determine (1) the location of features and relationships to other features, (2) where the most and/or least of some feature exists, (3) the density of features in a given space, (4) what is happening inside an area of interest (AOI), (5) what is happening nearby some feature or phenomenon, and (6) and how a specific area has changed over time (and in what way).

This GIS analysis and data mapping provides an examination of three types of data: (1) student location data; (2) general demographic data; and (3) a campus drive-time analysis. This data will be presented in a series of maps throughout this chapter of the environmental scan.

STUDENT HOME ADDRESS & DRIVE TIME ANALYSIS

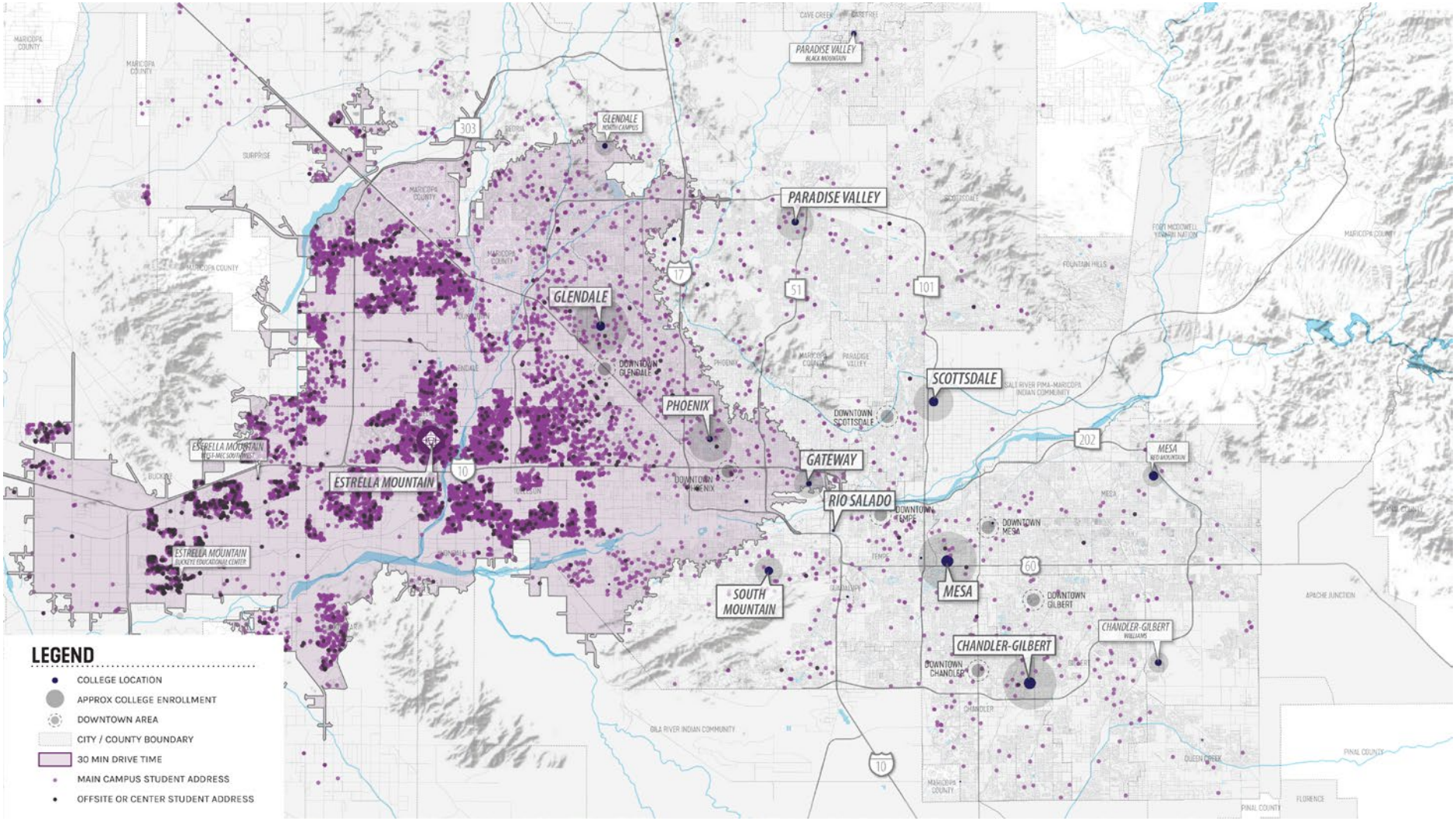
The first set of maps provide a GIS map of each college's students' home address and a drive time analysis for each of the main campus locations for the ten colleges in the MCCCD. For each map and campus location, the shaded area shows the boundary from which a potential student can reach each campus in 30 minutes or less. The student home addresses are mapped using dots consisting of two colors. The lighter color indicates students who attend the main campus location, and the darker dots indicate the students that attend other offsite or center locations for each college. These maps can help each college understand from a geographic perspective from where and how far students travel to take courses on each campus.

FIGURE 2.1 | CHANDLER-GILBERT COMMUNITY COLLEGE



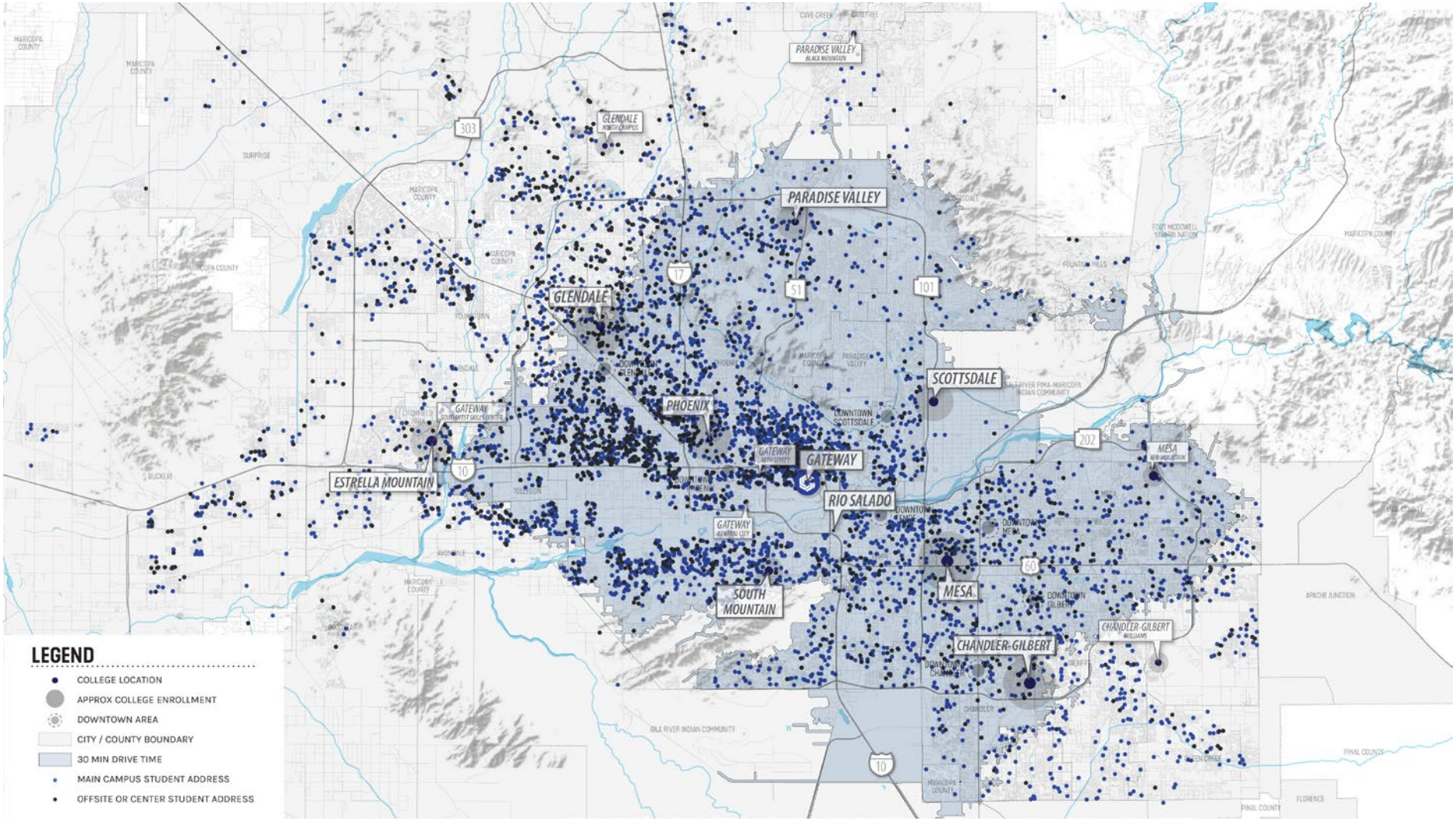
Source: MCCCD Office of Institutional Research, Fall 2019 Student Home Addresses

FIGURE 2.2 | ESTRELLA MOUNTAIN COMMUNITY COLLEGE



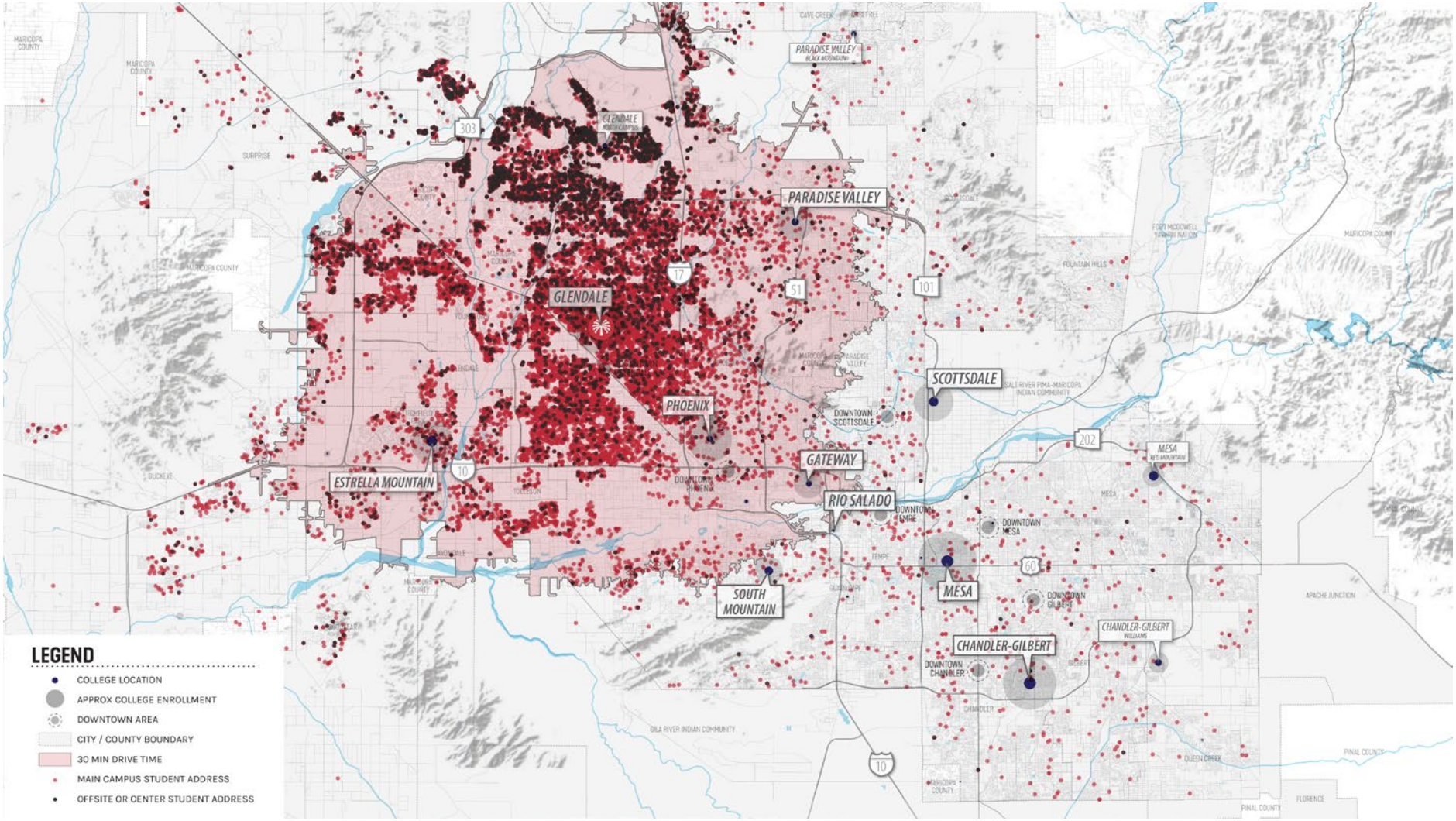
Source: MCCCD Office of Institutional Research, Fall 2019 Student Home Addresses

FIGURE 2.3 | GATEWAY COMMUNITY COLLEGE



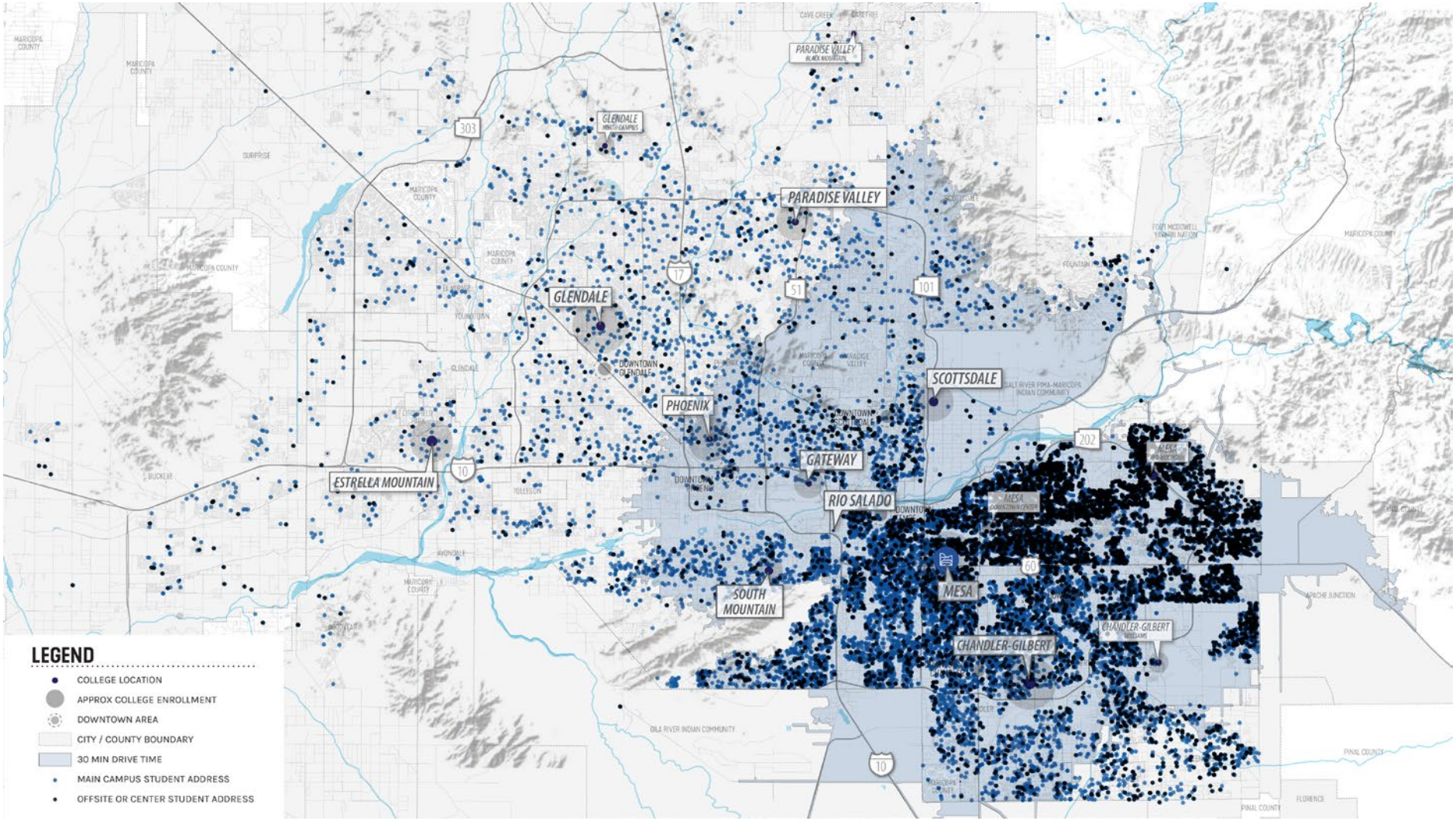
Source: MCCCD Office of Institutional Research, Fall 2019 Student Home Addresses

FIGURE 2.4 | GLENDALE COMMUNITY COLLEGE



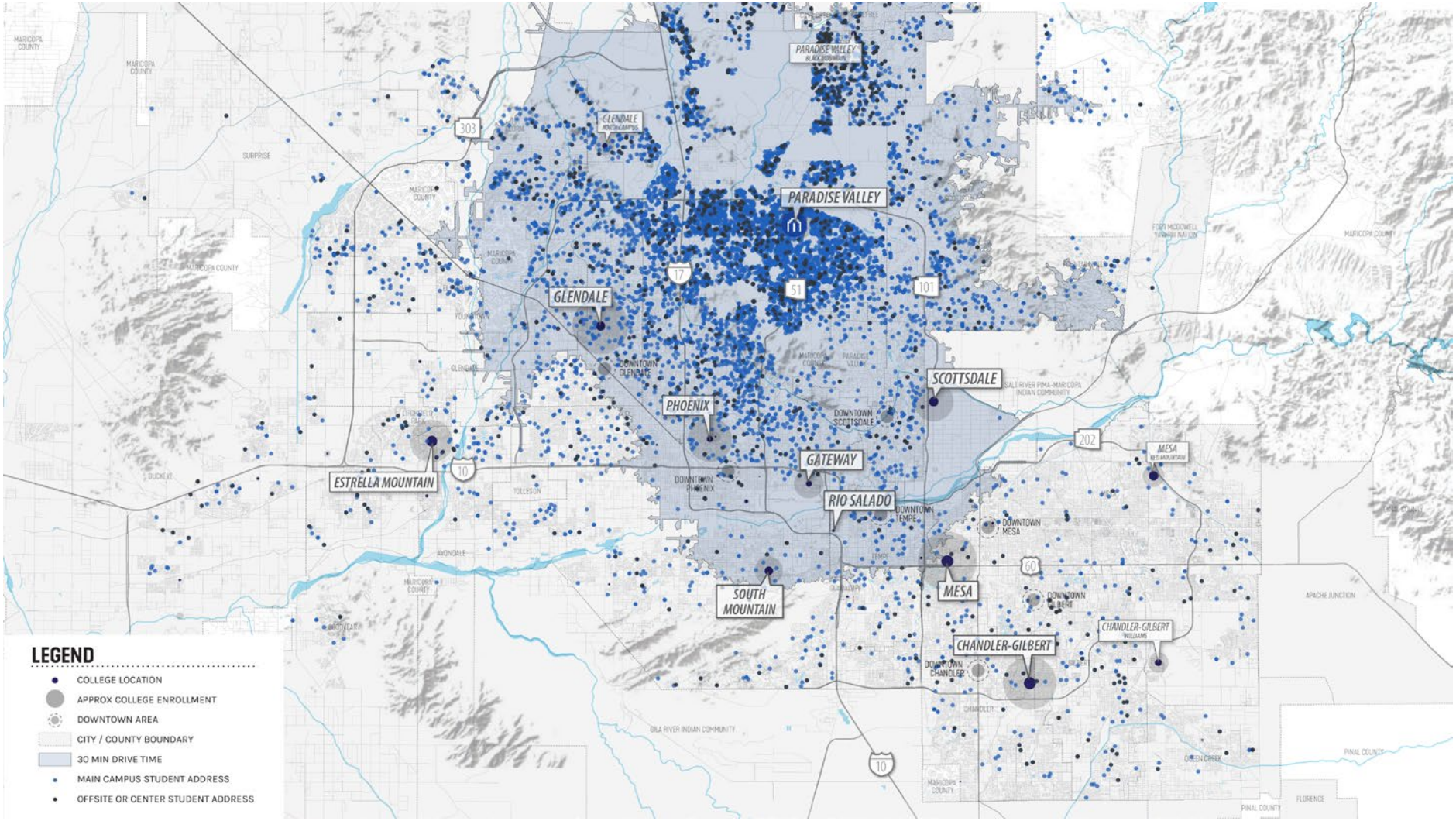
Source: MCCCD Office of Institutional Research, Fall 2019 Student Home Addresses

FIGURE 2.5 | MESA COMMUNITY COLLEGE



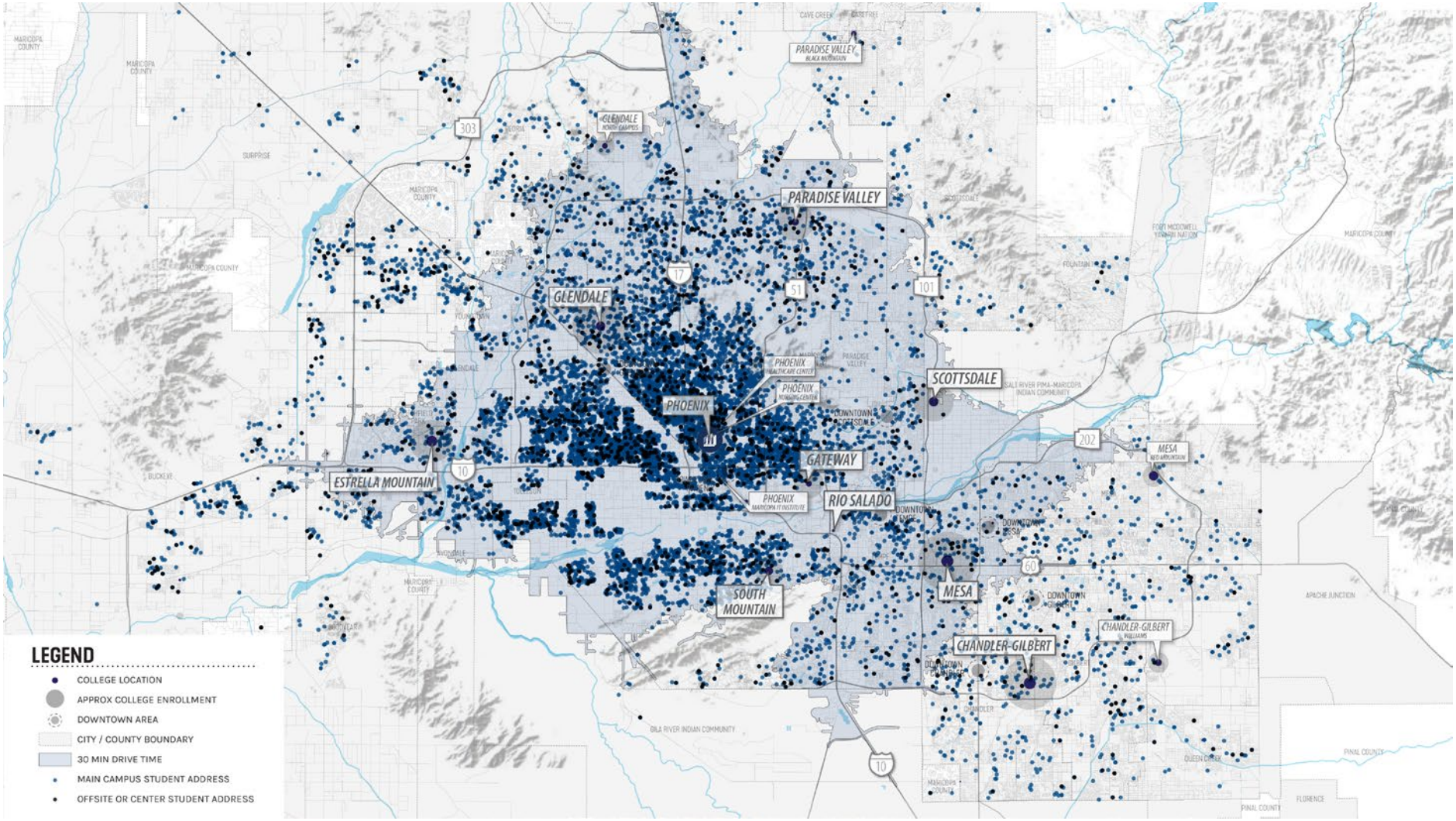
Source: MCCCD Office of Institutional Research, Fall 2019 Student Home Addresses

FIGURE 2.6 | PARADISE VALLEY COMMUNITY COLLEGE



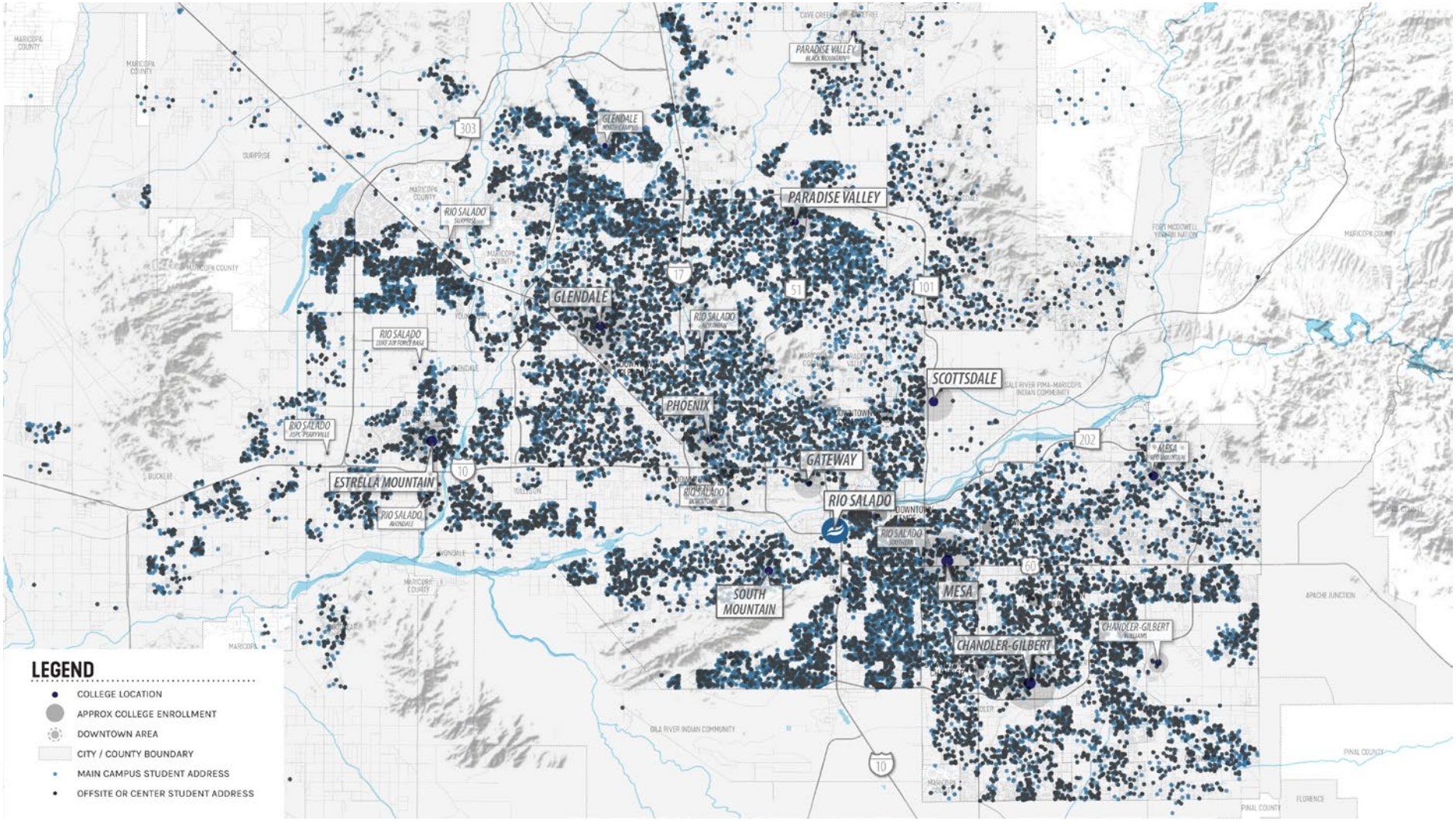
Source: MCCCD Office of Institutional Research, Fall 2019 Student Home Addresses

FIGURE 2.7 | PHOENIX COLLEGE



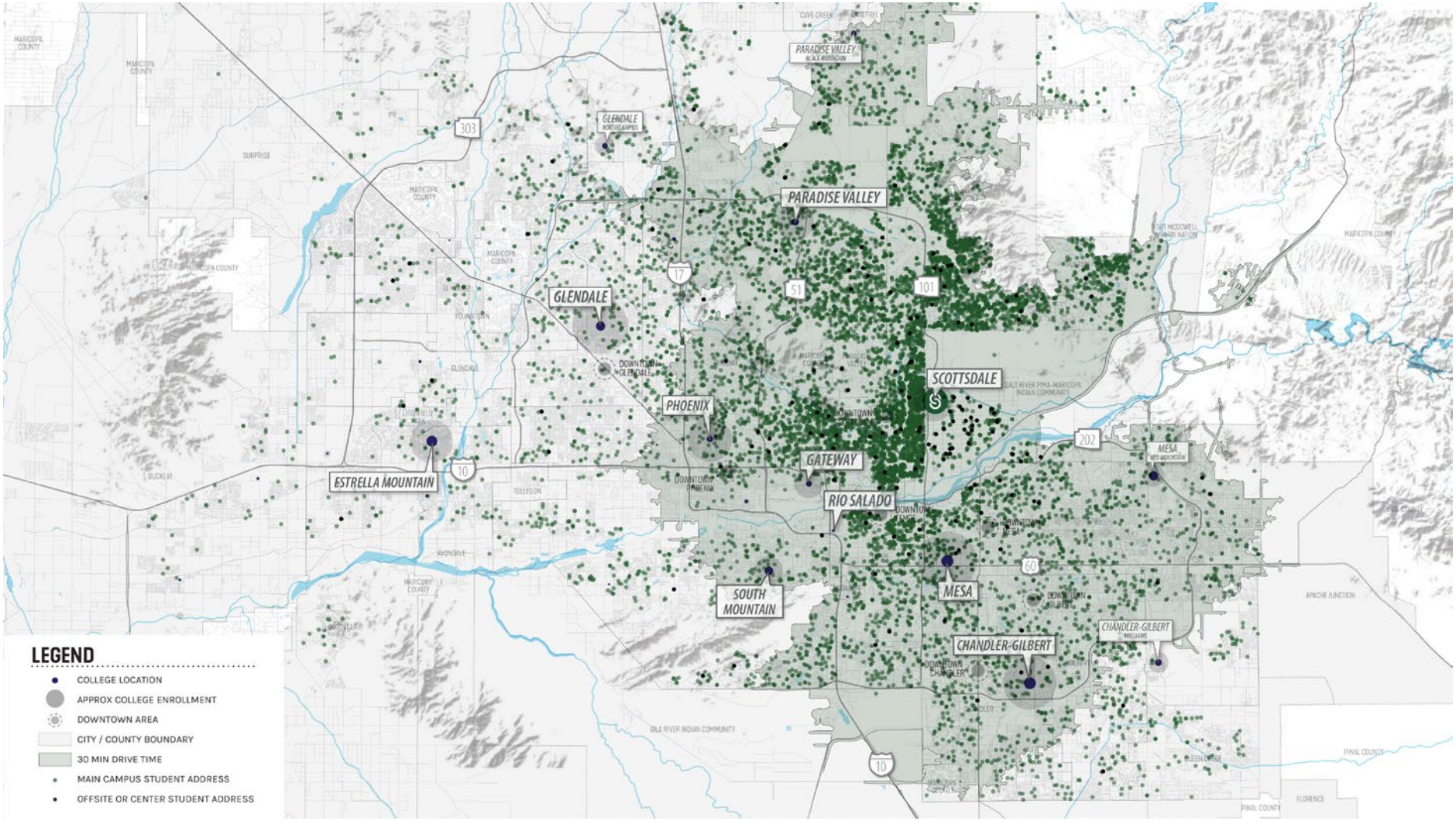
Source: MCCCD Office of Institutional Research, Fall 2019 Student Home Addresses

FIGURE 2.8 | RIO SALADO COLLEGE



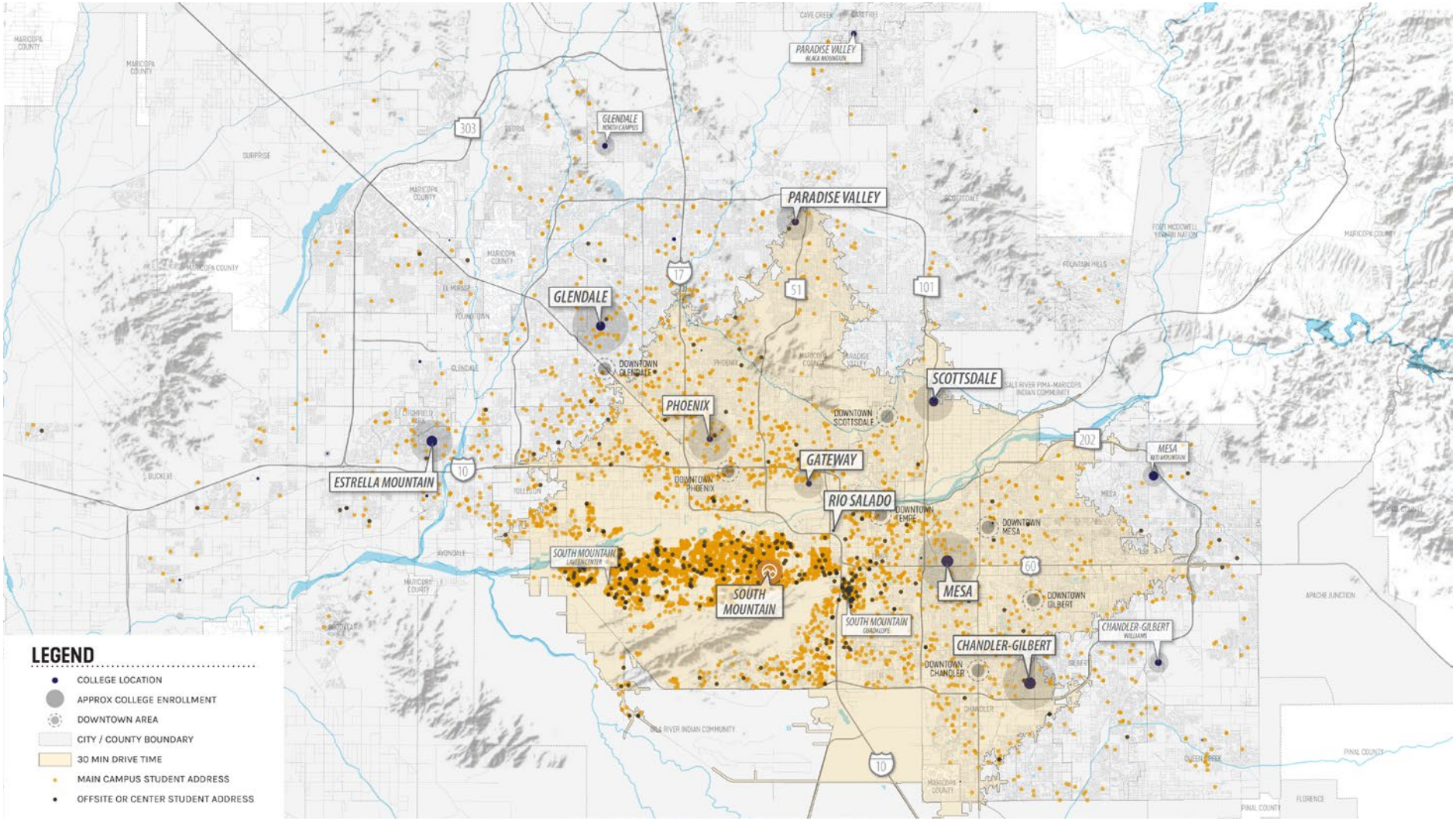
Source: MCCCD Office of Institutional Research, Fall 2019 Student Home Addresses

FIGURE 2.9 | SCOTTSDALE COMMUNITY COLLEGE



Source: MCCCD Office of Institutional Research, Fall 2019 Student Home Addresses

FIGURE 2.10 | SOUTH MOUNTAIN COMMUNITY COLLEGE

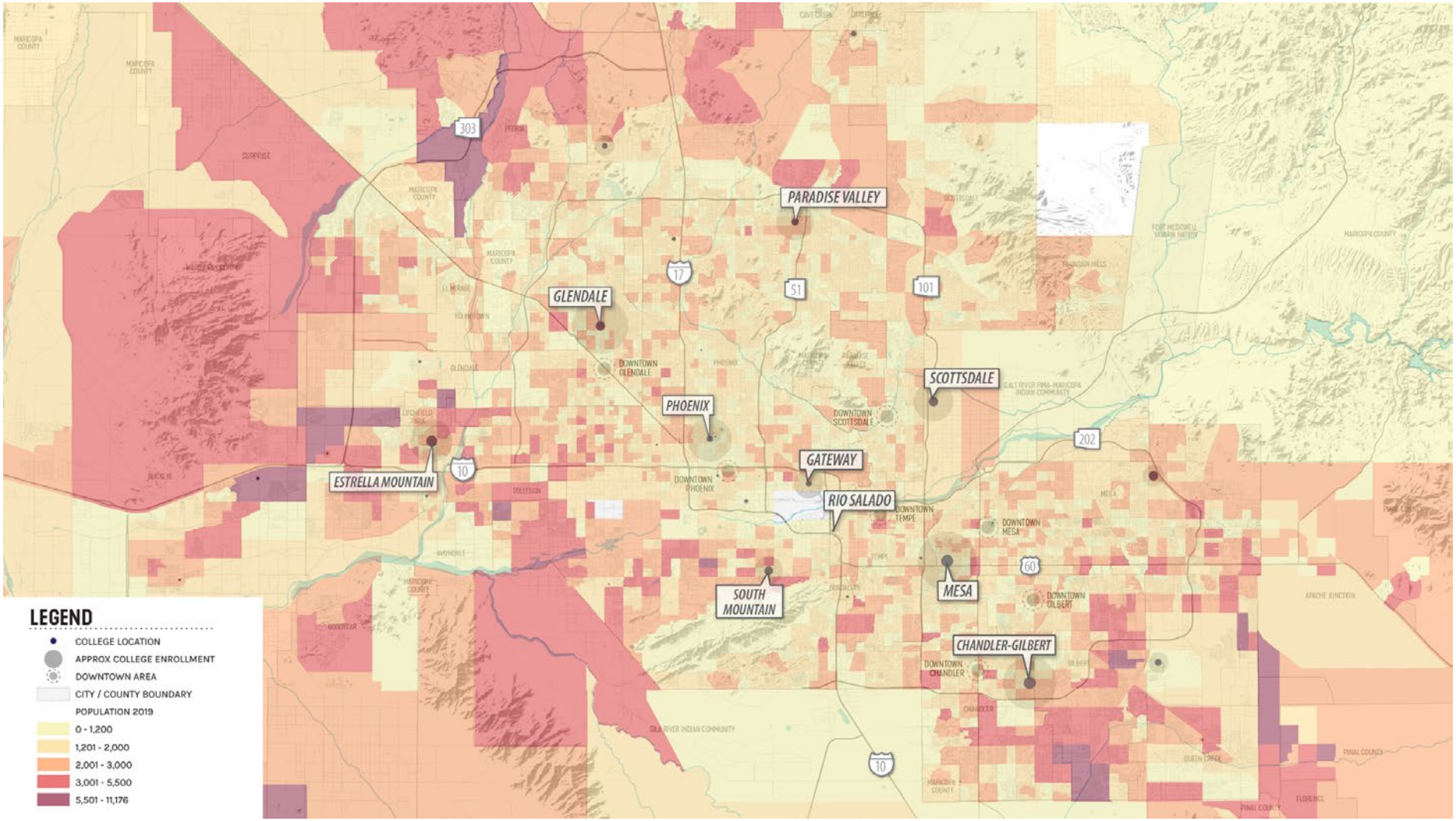


Source: MCCCD Office of Institutional Research, Fall 2019 Student Home Addresses

POPULATION BY CENSUS TRACT 2019

Figure 2.11 is based upon a map of the census tracts in Maricopa County, which shows the density of the population for each tract based upon the total 2019 population. On the map, the darker the color shading represents census tracts with more residents, and the lighter shading represents census tracts with fewer residents. The shading represents five different ranges of the resident population in each census tract.

FIGURE 2.11 | MARICOPA COUNTY CENSUS TRACTS: 2019

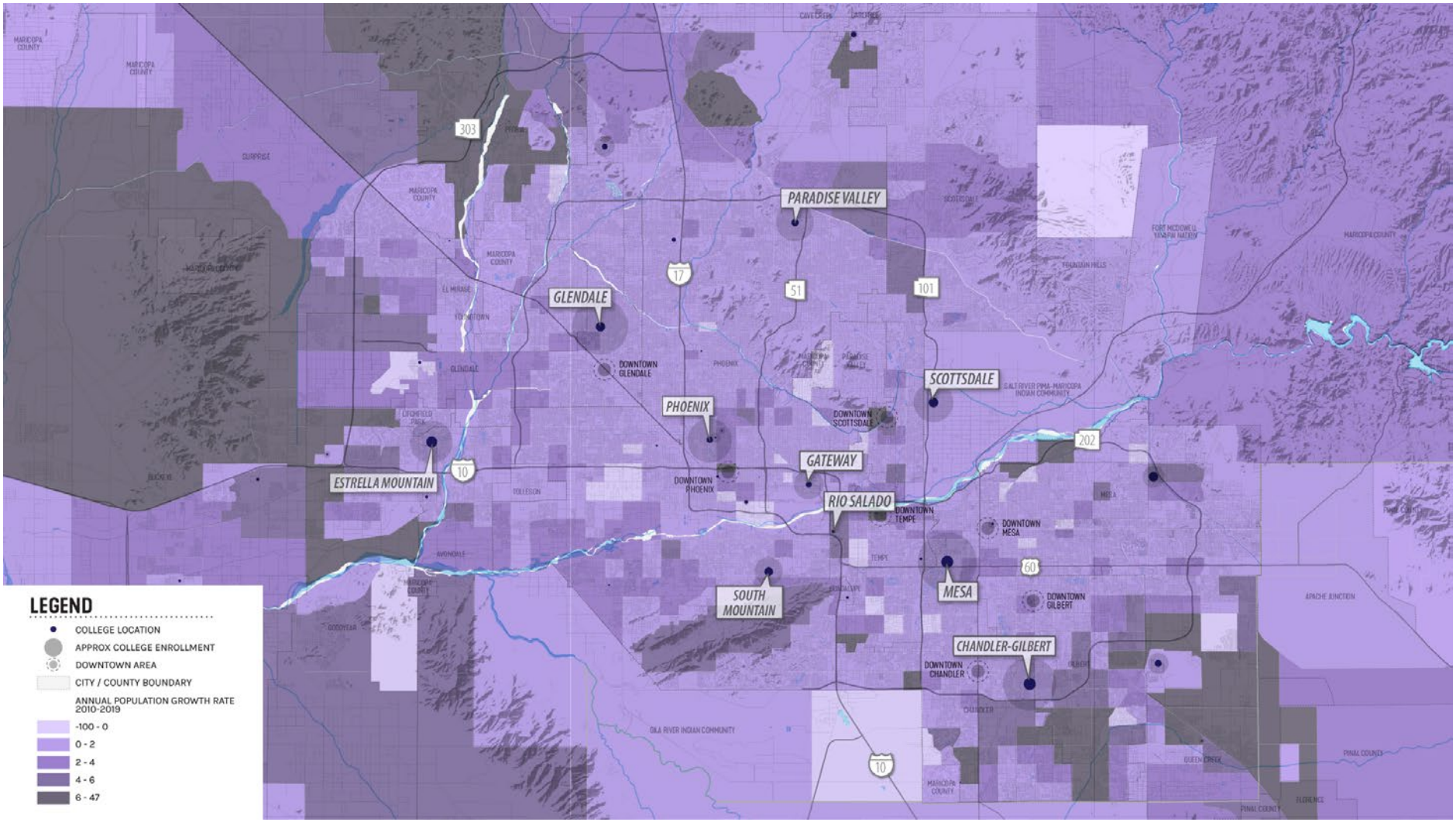


Source: U.S. Census Bureau, Census Planning Database (2020)

MARICOPA COUNTY POPULATION GROWTH RATE 2010-2020

Figure 2.12 shows the annual growth rate for each census tract in Maricopa County from 2010 to 2020. The darker shaded census tracts indicate higher growth rates. Overall, every census tract in the county experienced some population growth over the last ten years. Two general areas stand out, which have seen greater growth than some areas. The southeast part of Maricopa County has experienced heavier growth along with the northwest area of the county.

FIGURE 2.12 | MARICOPA COUNTY POPULATION GROWTH RATE: 2010-2020

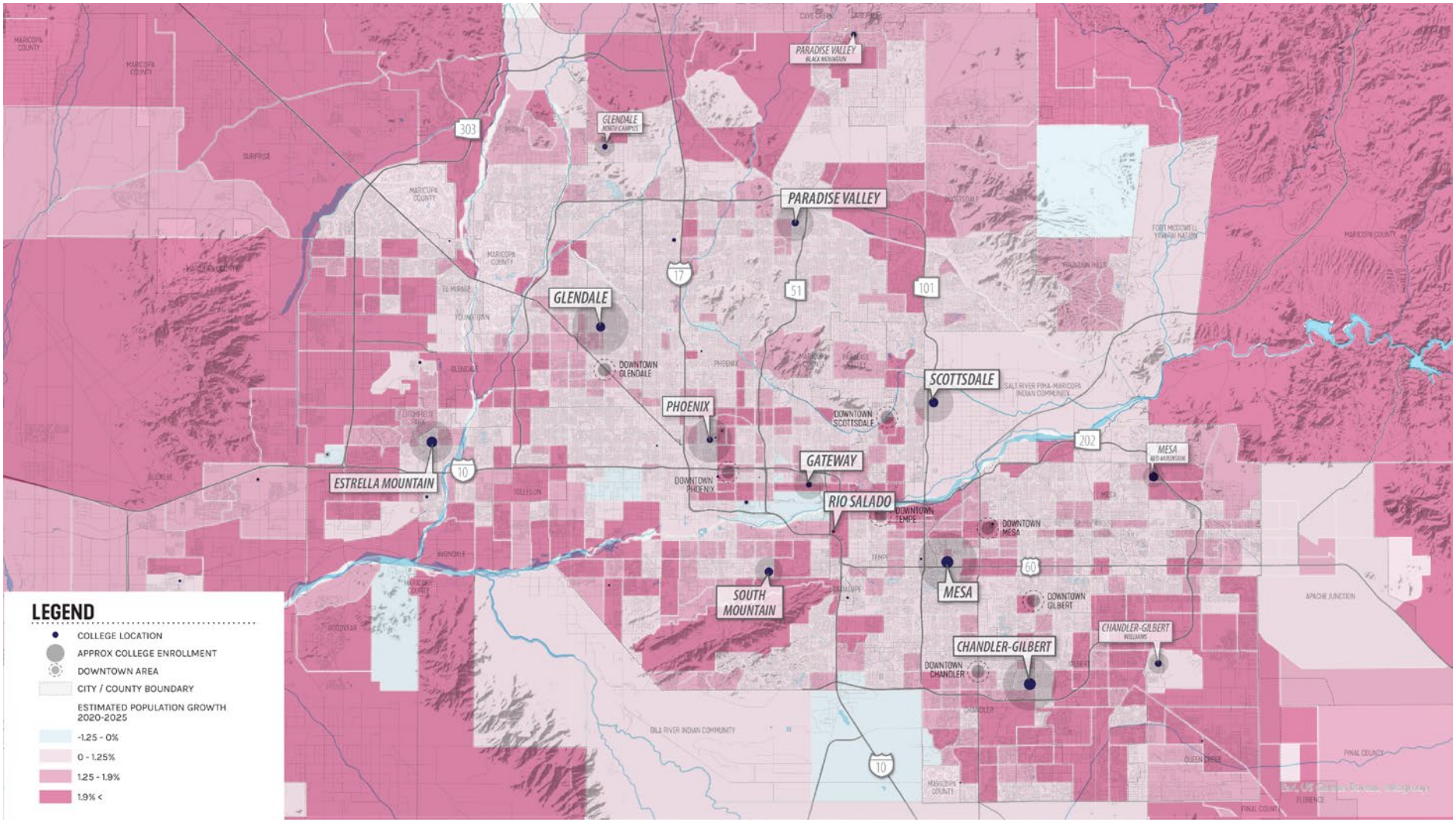


Source: ESRI & U.S. Census Bureau (2020)

MARICOPA COUNTY PROJECTED POPULATION GROWTH 2020-2025

Figure 2.13 shows the projected population growth for each census tract in Maricopa County over the next five years. The darker shaded census tracts will experience the greatest growth over the next five years. Overall, most census tracts are projected to grow by between 1-2%. A few census tracts are projected to decline, as represented by the light blue shaded tracts.

FIGURE 2.13 | MARICOPA COUNTY PROJECTED POPULATION GROWTH: 2020-2025

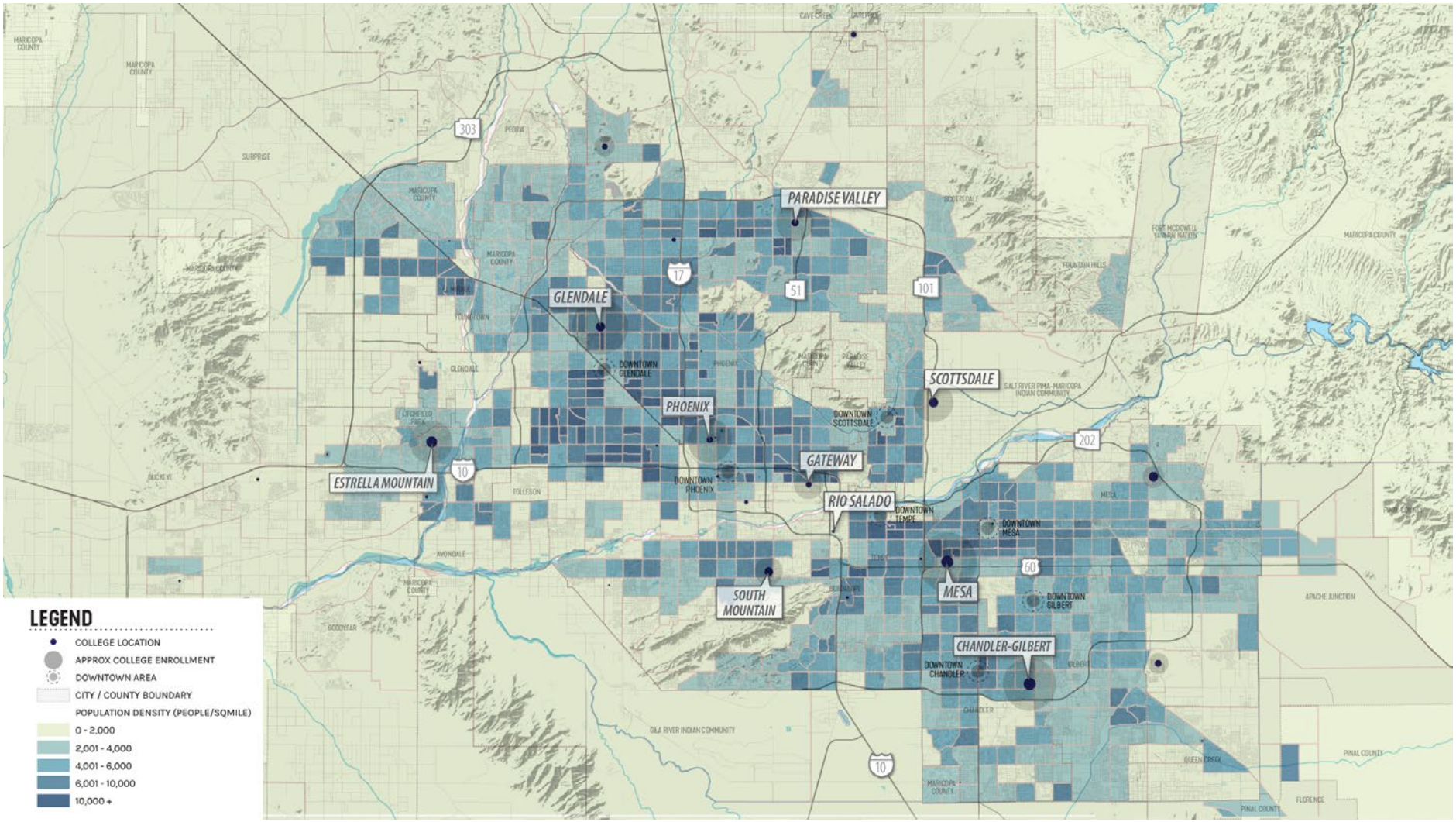


Source: ESRI & U.S. Census Bureau (2020)

POPULATION DENSITY

Figure 2.14 shows the overall population density by census tract in Maricopa County. The darker census tracts indicate a higher number of people per square mile living in that specific tract. The darkest blue shading indicates a population density of over 10,000 people per square mile. In general, Maricopa County areas that are indicating the greatest population growth are outside of the areas that currently show the greatest density.

FIGURE 2.14 | MARICOPA COUNTY POPULATION DENSITY

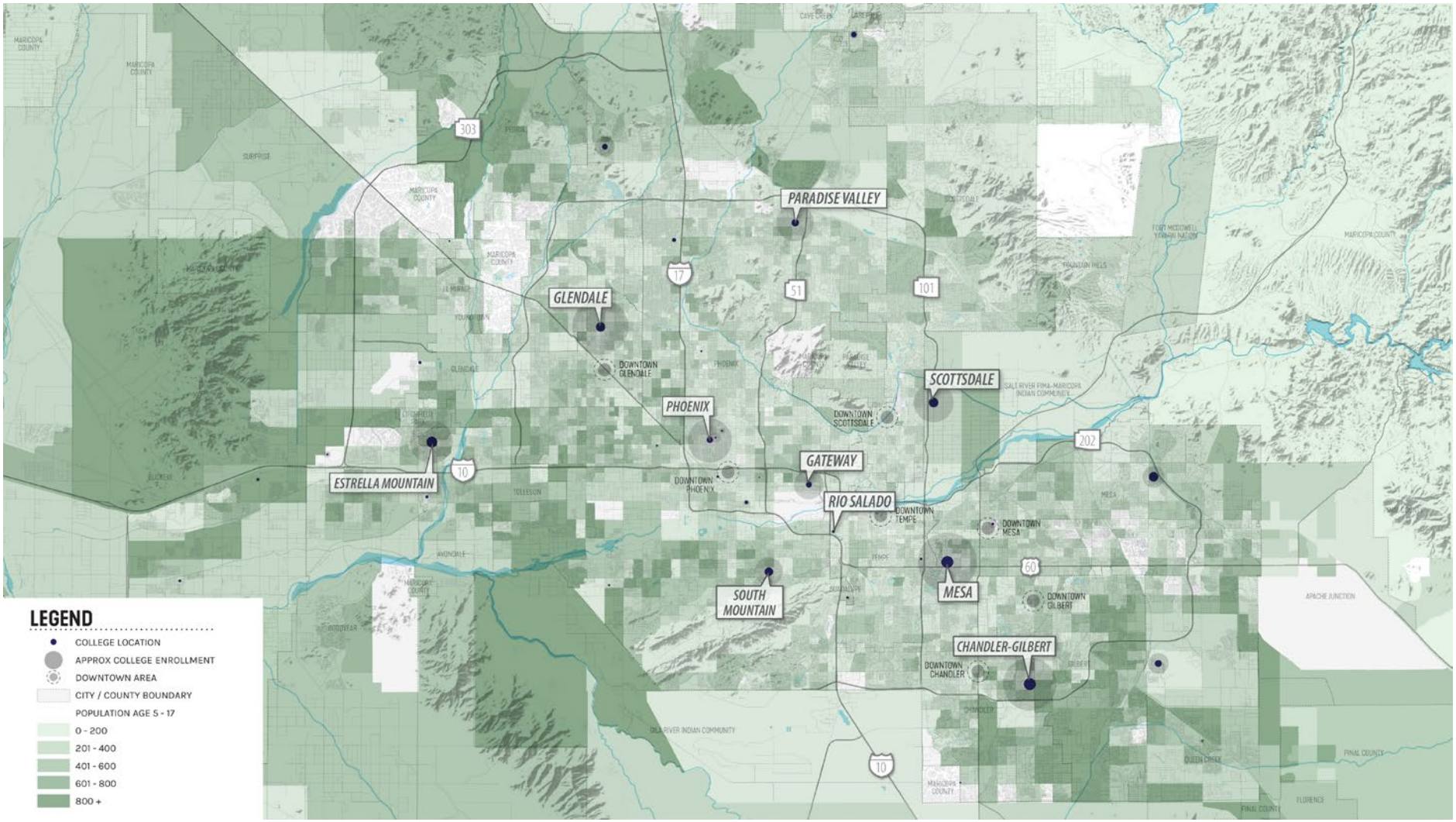


Source: ESRI & U.S. Census Bureau (2020)

POPULATION AGE 5-17

Figure 2.15 shows where the population of residents age 5-17 live in Maricopa County. The darker the shading, the more residents there are in this age category. This age range of residents is a good indicator of where future potential students reside. As indicated on the map, the greatest concentration of residents in this age cohort are in the southeast, southwest, west, and northwest areas of the county's perimeter.

FIGURE 2.15 | MARICOPA COUNTY POPULATION: AGE 5-17

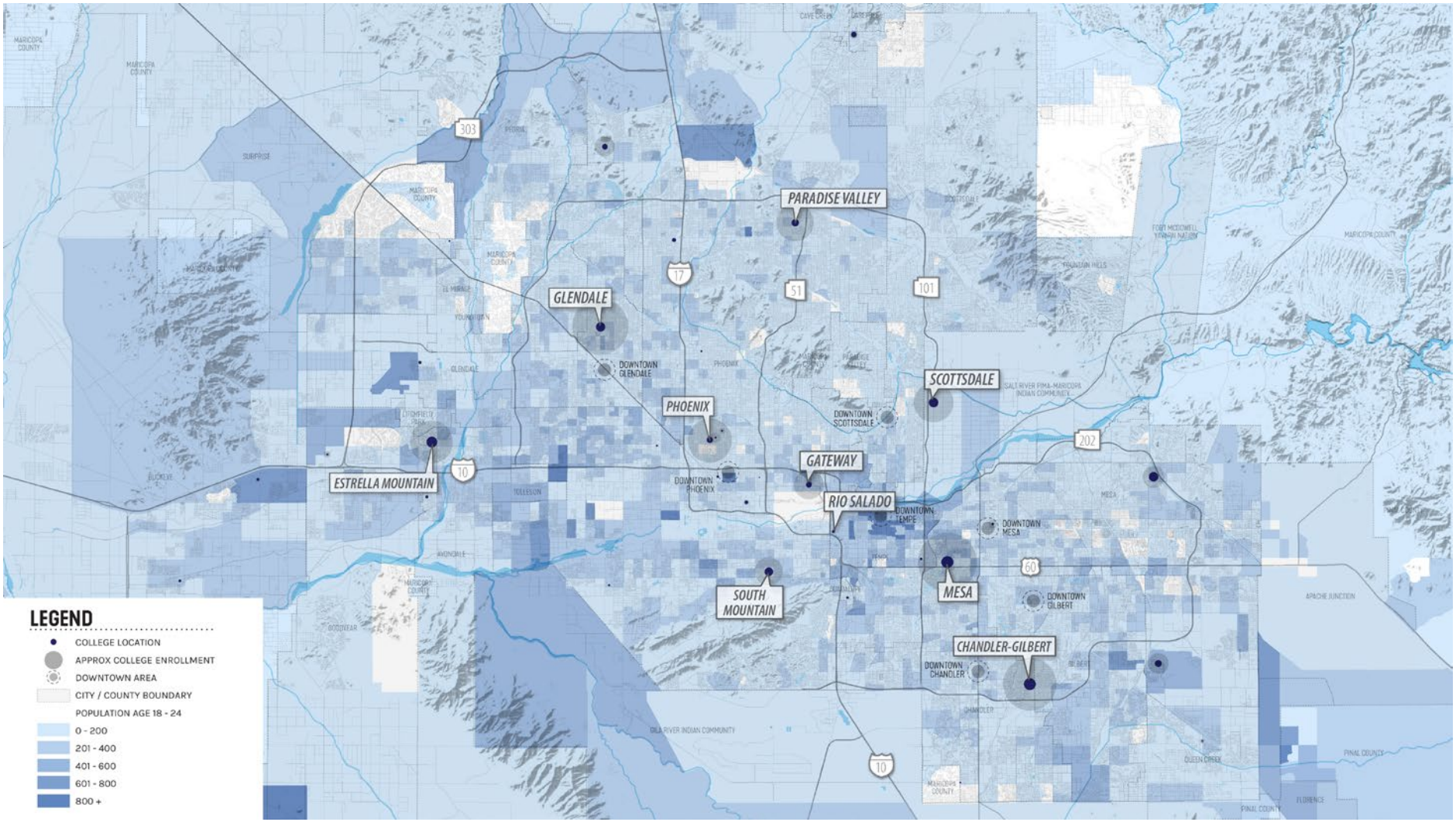


Source: U.S. Census Bureau, Census Planning Database (2020)

POPULATION AGE 18-24

Figure 2.16 shows where the population of residents age 18-24 live in Maricopa County. The darker the shading, the more residents there are in this age cohort. This age range of residents is again a good indicator of where future potential students reside. As depicted in the map, this age cohort is distributed fairly evenly across the county.

FIGURE 2.16 | MARICOPA COUNTY POPULATION: AGE 18-24

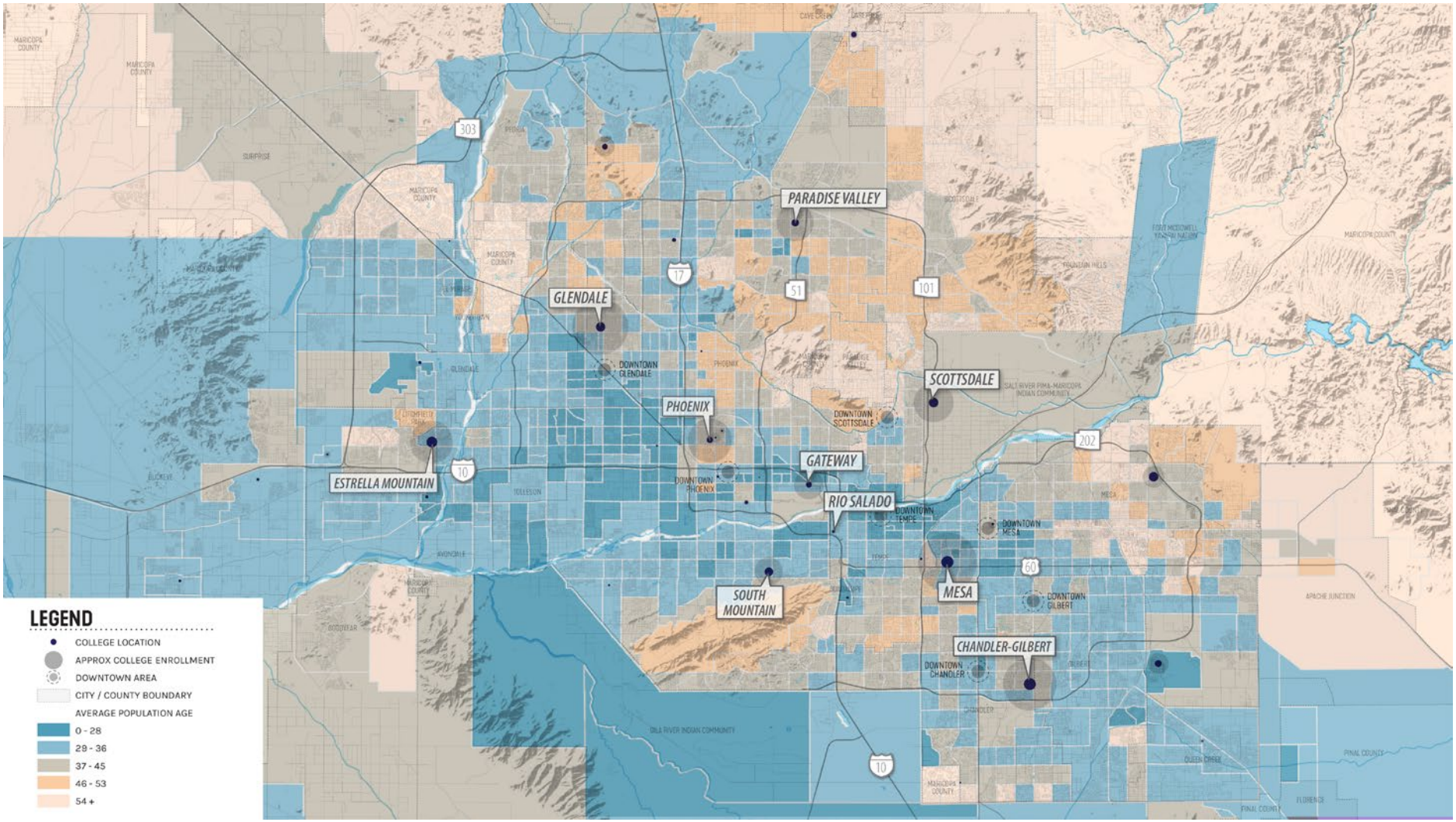


Source: U.S. Census Bureau, Census Planning Database (2020)

AVERAGE AGE OF POPULATION

Figure 2.17 shows the average age of the population living in each census tract in 2019. The data is broken out by five age cohorts: 0-28; 29-36; 37-45; 46-53; and 54+. The darker shaded census tracts represent the younger age cohorts, and the lighter shades represent the older age cohorts.

FIGURE 2.17 | MARICOPA COUNTY AVERAGE AGE OF POPULATION

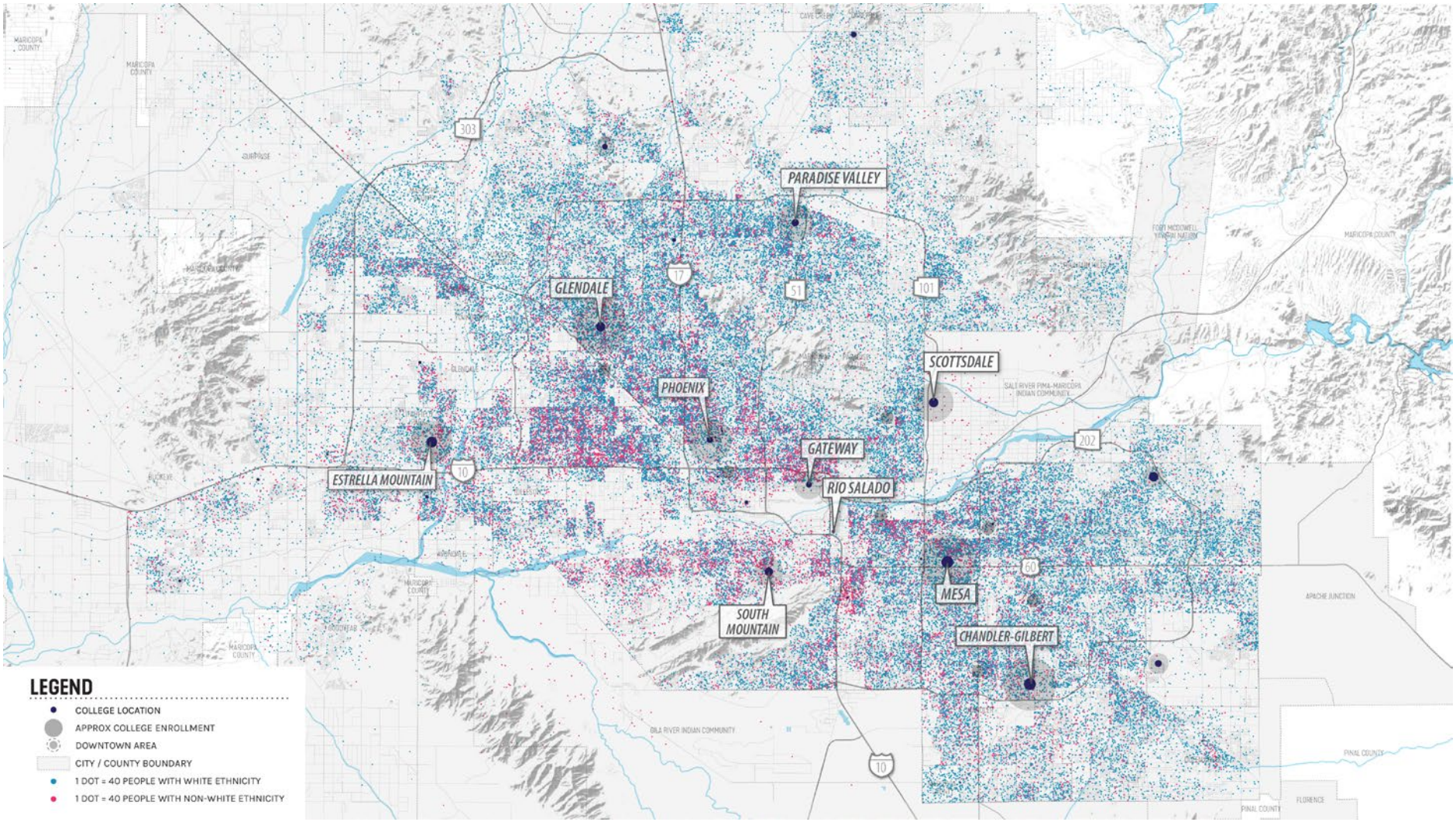


Source: ESRI & U.S. Census Bureau (2020)

DIVERSITY

Figure 2.18 shows the diversity of the population living in Maricopa County. Each blue dot represents 40 people with white ethnicity on this map, and each red dot represents 40 people with non-white diversity. As shown on the map, there are very distinct areas with high concentrations of residents with non-white ethnicity. In other areas, the data shows significant concentrations of residents with predominantly white ethnicity. There is a significant band of residents with non-white ethnicity extending through Phoenix's central core just to the north and south of I-10.

FIGURE 2.18 | MARICOPA COUNTY DIVERSITY

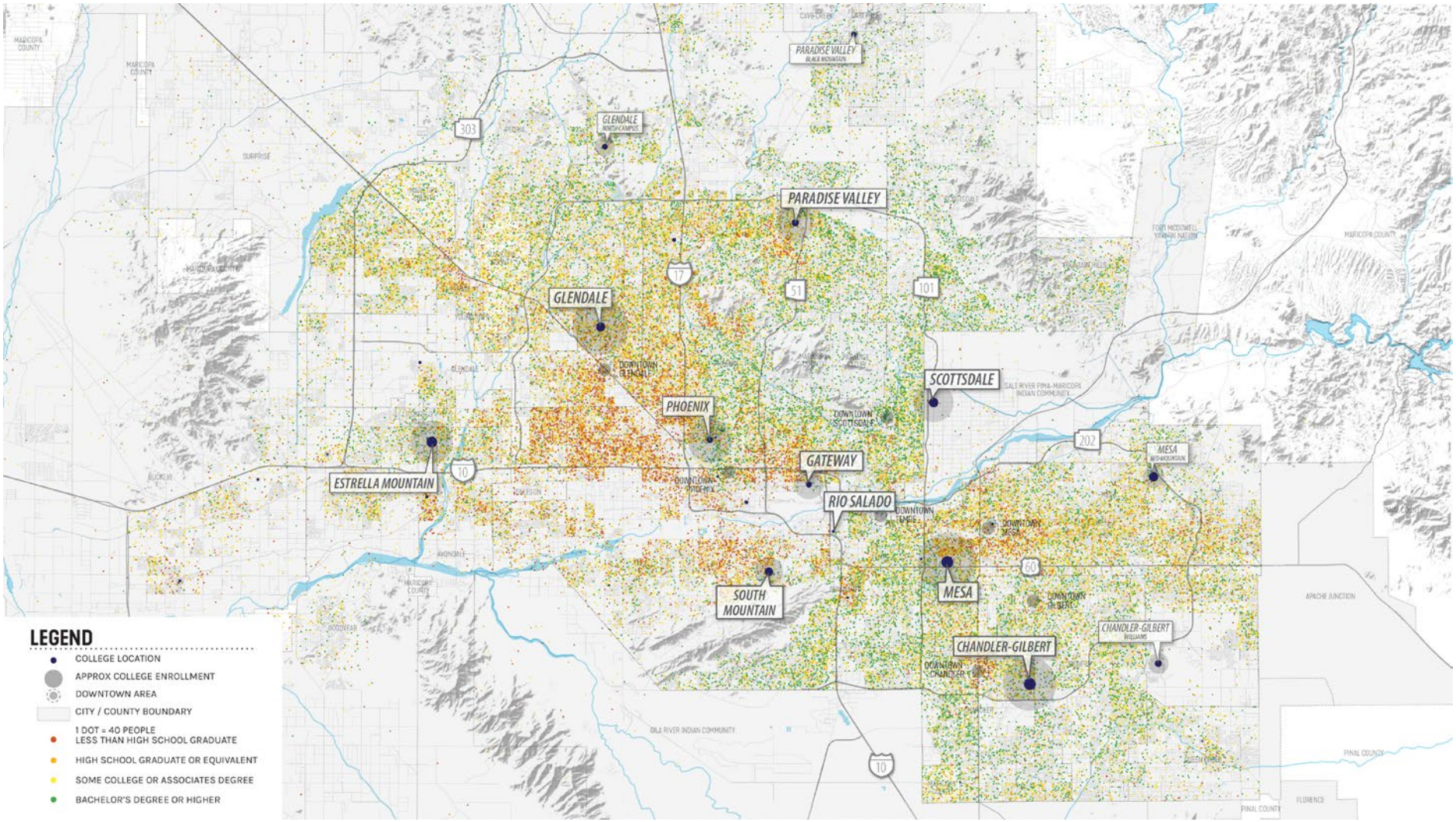


Source: U.S. Census Bureau (2020)

EDUCATION

Figure 2.19 shows the overall distribution of residents and their educational attainment. There are four distinct levels of education attainment depicted on the map. Red dots represent 40 residents with less than a high school diploma, orange dots represent 40 residents with a high school education or equivalent, yellow dots represent 40 residents with some college or an associate degree, and green dots represent 40 residents with a bachelor degree or higher. Based upon those cohorts, there are distinguishable concentrations of residents with varying levels of education attainment. Specifically, one notable area is just west of Phoenix College, where there appears to be a high concentration of residents who have a high school education or less. Fairly discernible areas exist in the northeast and southeast areas of Maricopa County with noticeably higher levels of education attainment.

FIGURE 2.19 | MARICOPA COUNTY EDUCATION

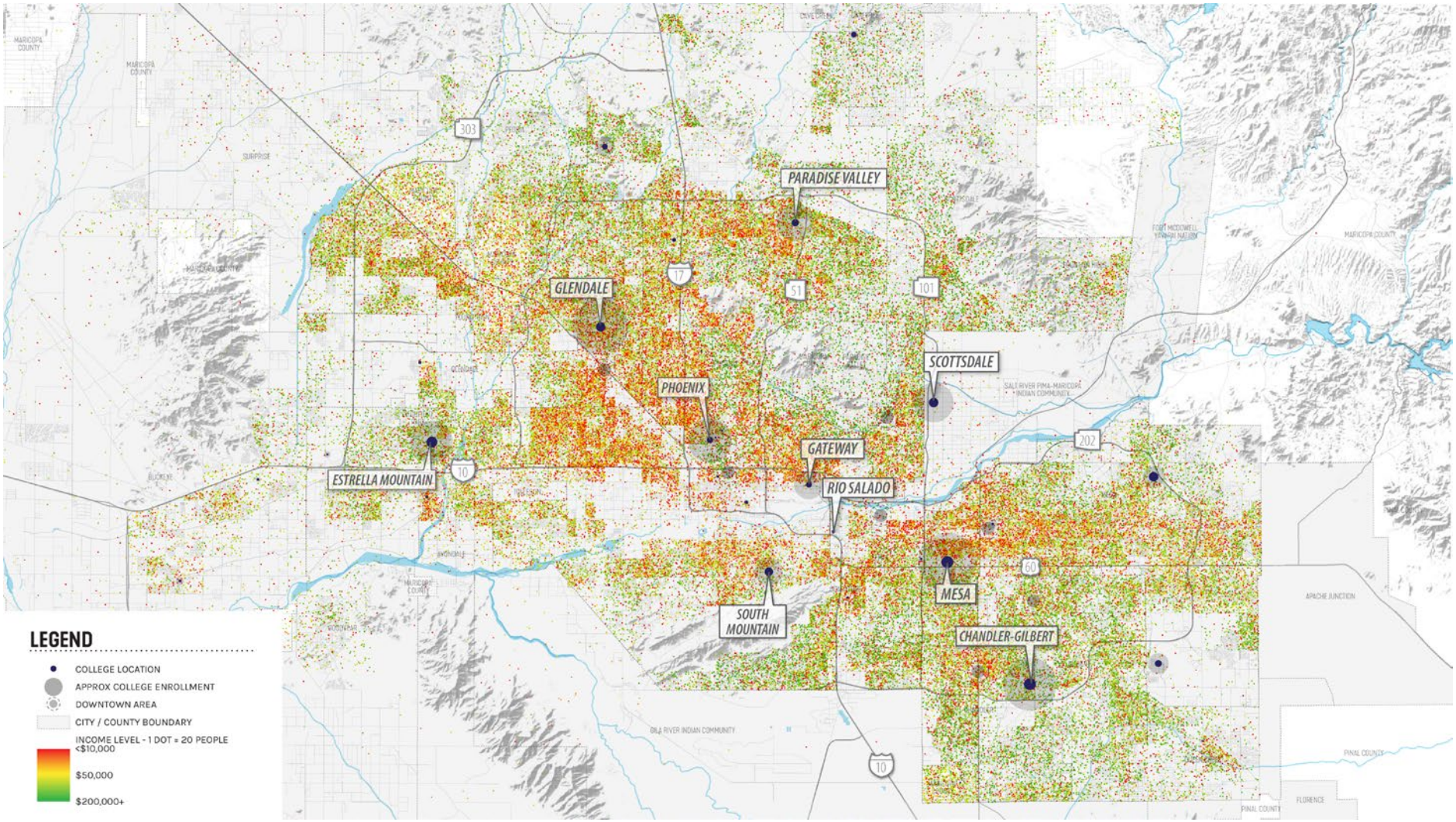


Source: U.S. Census Bureau (2020)

INCOME

Figure 2.20 provides data indicating the income of residents living in each census tract. The income information is provided across a spectrum of incomes represented by distinctive colors. The data on the map is represented by dots that indicate income levels. Red to yellow represents income ranging from $10,000 to $50,000, and yellow to green represents income ranging from $50,000 to $200,000 and over. The data on this map corresponds closely to the data on educational attainment. The shading areas representing educational attainment are almost interchangeable with the areas representing income levels by residents.

FIGURE 2.20 | MARICOPA COUNTY INCOME



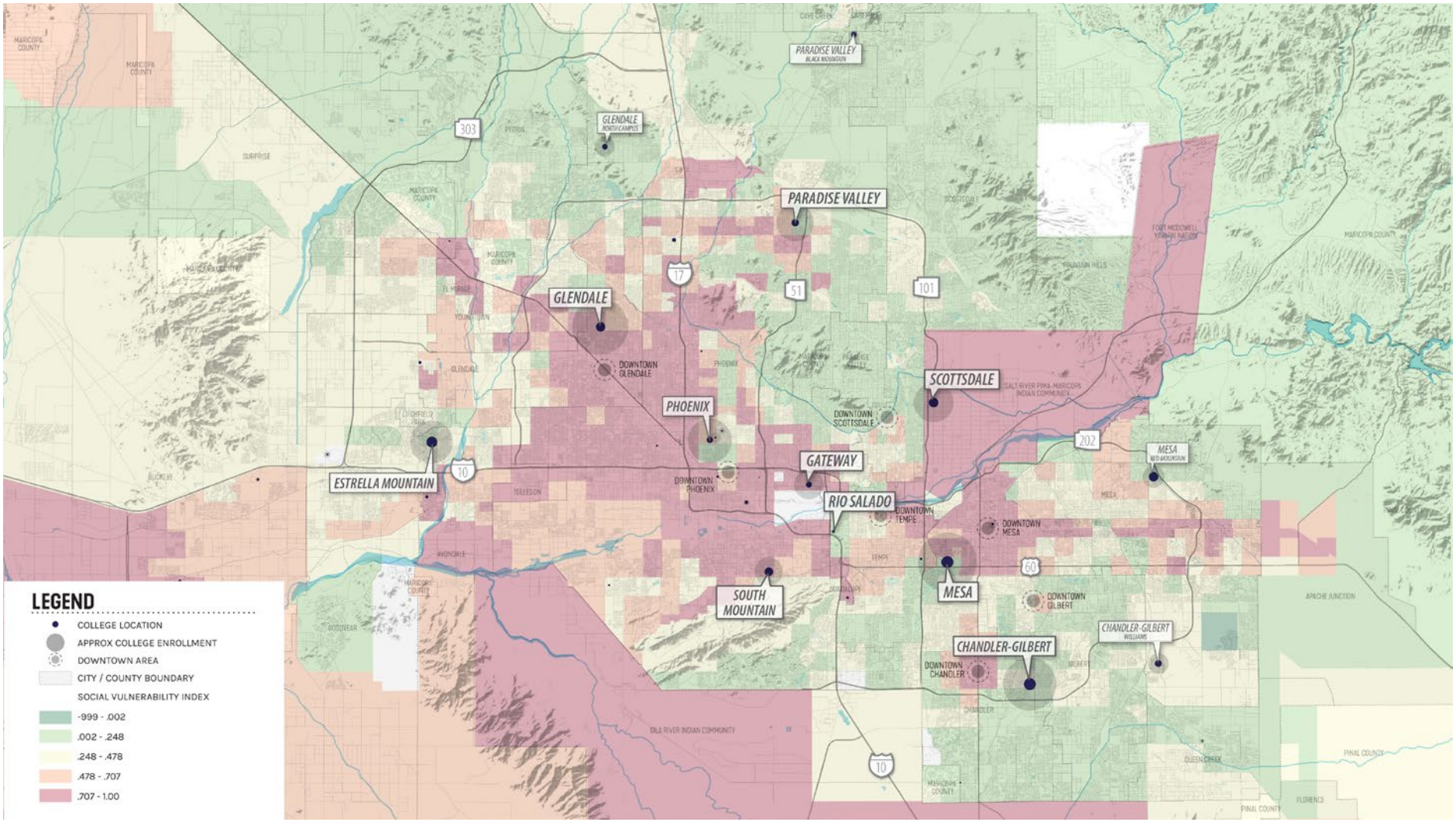
Source: U.S. Census Bureau (2020)

SOCIAL VULNERABILITY INDEX (SVI) MARICOPA COUNTY

Social vulnerability refers to socioeconomic and demographic factors that affect the resilience of communities. The Social Vulnerability Index (SVI) uses U.S. Census Bureau variables to help community planners understand where these populations exist within their communities. The tool is particularly useful for identifying and mapping the vulnerable geographic areas that are most likely to need focused support to improve their economic mobility.

The SVI uses U.S. Census Bureau data to determine the social vulnerability of every census tract. The SVI ranks each tract on 15 social factors, which are grouped into four domains. The four domains and the social factors are (1) Socioeconomic Status (consisting of income, poverty, employment, and education variables); (2) Household Composition/Disability (consisting of age, single parenting, and disability variables); (3) Minority Status/Language (consisting of race, ethnicity, and English language proficiency variables); and (4) Housing/Transportation (consisting of housing structure, crowding, and vehicle access variables). Each tract receives a separate ranking for each of the four themes and an overall ranking. The map below shows the SVI for each of the census tracts in Maricopa County.

FIGURE 2.21 | MARICOPA COUNTY SOCIAL VULNERABILITY INDEX

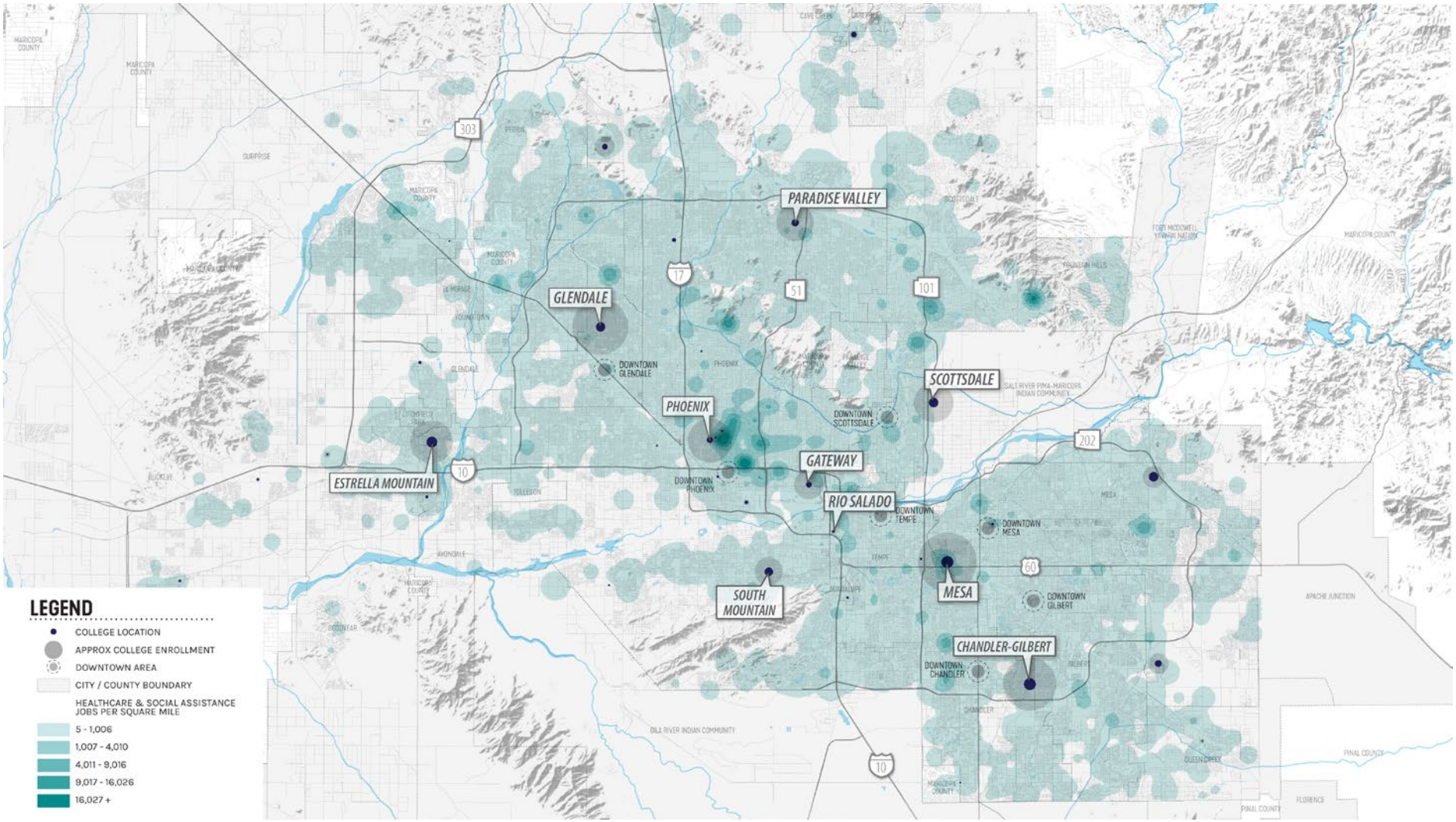


Source: U.S. Census Bureau, Census Planning Database (2020)

INDUSTRY SECTOR HEAT MAPS

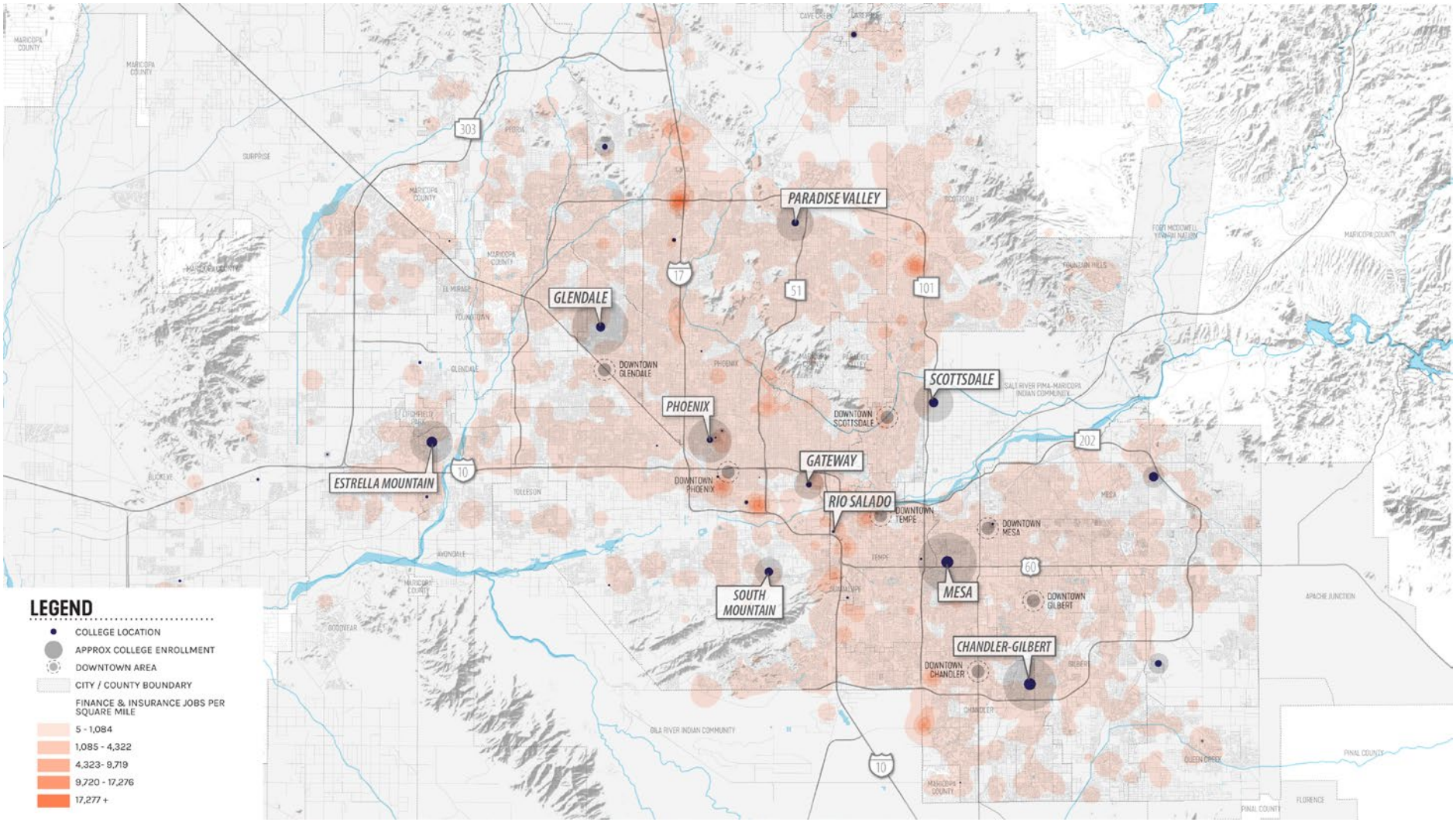
Figures 2.22-2.25 show maps that indicate the geographic location and density of jobs using the North American Industry Classification System (NAICS). Four industry areas are shown, which include: (1) healthcare; (2) finance; (3) manufacturing; and (4) construction. These four industry sector maps are shown as examples of how the industry sectors are geographically located in relation to each college campus location.

FIGURE 2.22 | MARICOPA COUNTY HEALTHCARE JOBS



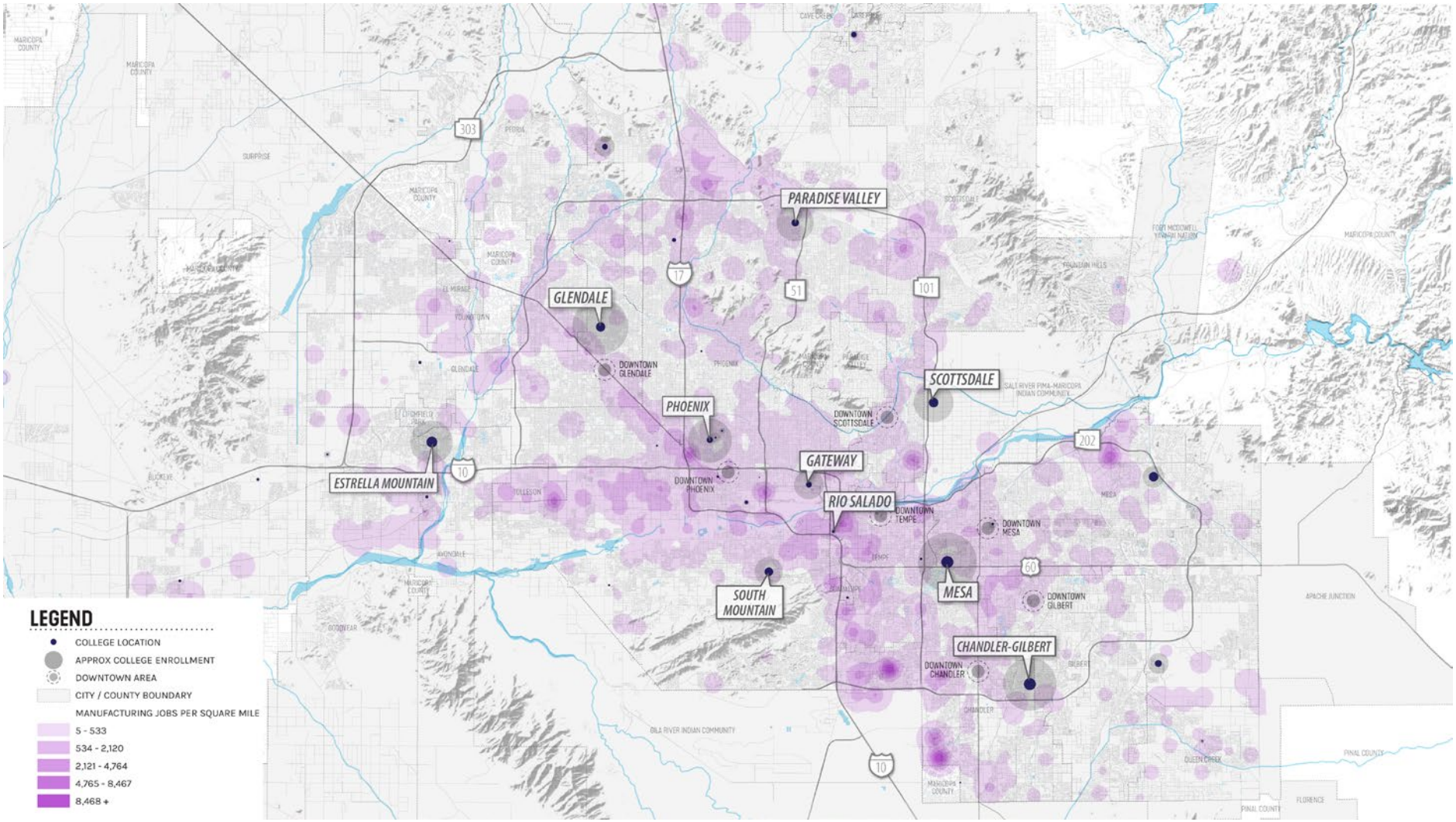
Source: U.S. Census Bureau, Center for Economic Studies: LEHD (2018)

FIGURE 2.23 | MARICOPA COUNTY FINANCE JOBS



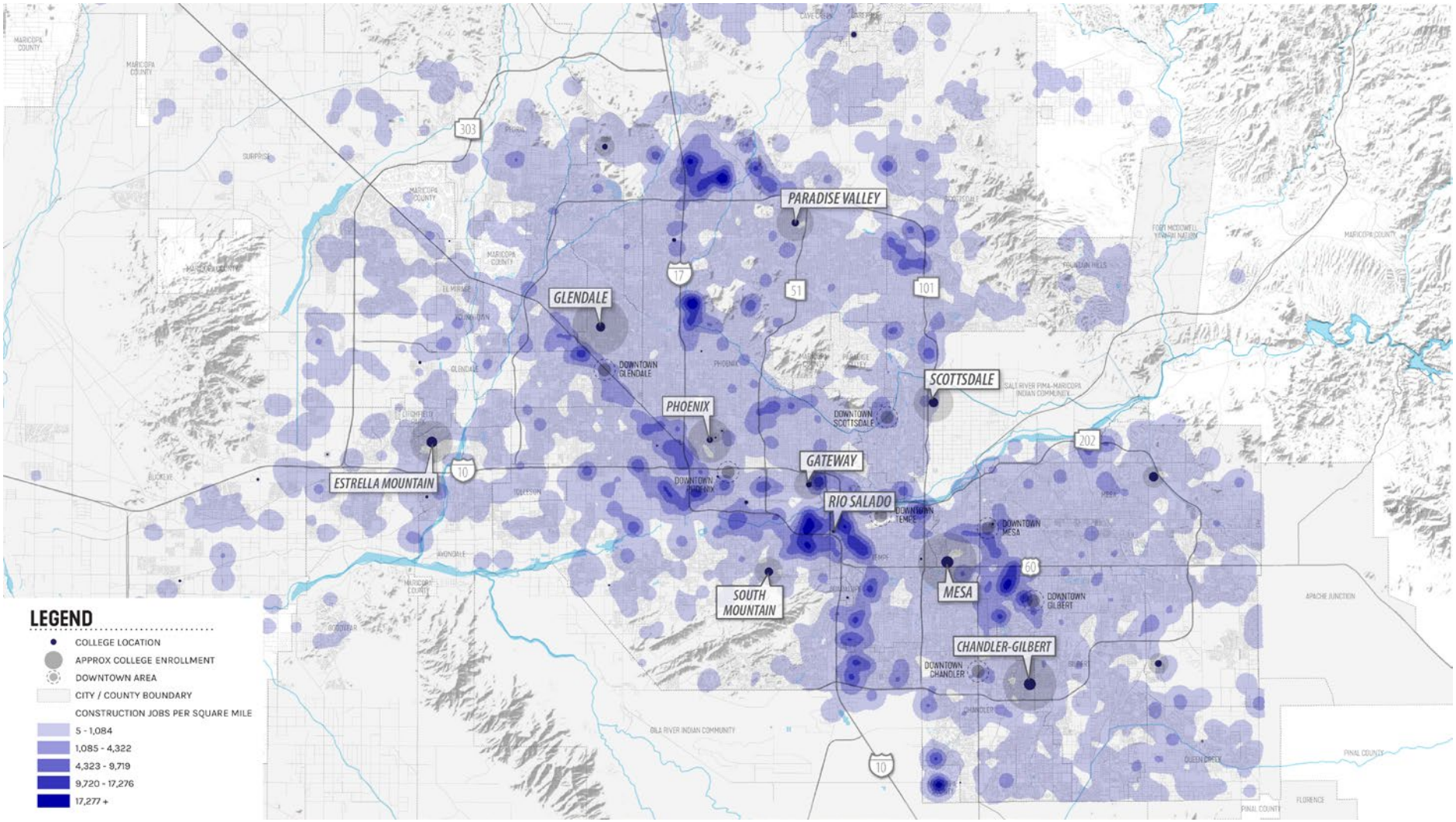
Source: U.S. Census Bureau, Center for Economic Studies: LEHD (2018)

FIGURE 2.24 | MARICOPA COUNTY MANUFACTURING JOBS



Source: U.S. Census Bureau, Center for Economic Studies: LEHD (2018)

FIGURE 2.25 | MARICOPA COUNTY CONSTRUCTION JOBS



Source: U.S. Census Bureau, Center for Economic Studies: LEHD (2018)

CHAPTER 3 COLLEGE READINESS

FOCUS AREA:

While community colleges are open-access institutions, performance on standardized test scores reflect recent high school graduates' skills and abilities and their possible need for developmental education or study skills before starting college-level coursework. Differences in college readiness by race and ethnicity suggest that academic success centers must be prepared to implement various strategies and programs to ensure effective onboarding and student success.

SUMMARY OF FINDINGS:

- The percent of high school students graduating in four years declined in 2017 and is lower than surrounding states, with Maricopa County in the bottom quartile among all Arizona counties.
- In 2019, Arizona ranked fifth in eighth-grade math scores administered by the National Assessment of Educational Progress (NAEP).
- Maricopa County was the top performer for students scoring proficient or higher on the eighth-grade AzMerit test.
- Average ACT scores are lower for Arizona ACT test takers than those of the U.S. There was a slight reduction in the average scores for the 2016–17 school year.

QUESTIONS FOR THIS FOCUS AREA:

- What impact do graduation rates and test scores have on your institution and the various student and academic support services provided to students?
- How will declines in high school graduation rates and reductions in test scores impact future college operations? Are there space or staffing considerations that need to be addressed in the district-wide campus master plan?

HIGH SCHOOL GRADUATION RATES

FIGURE 3.1 | PERCENT OF PUBLIC HIGH SCHOOL STUDENTS GRADUATING IN FOUR YEARS (2017)

In 2017, Arizona had 78% of public high school students graduating on time, ranking eighth out of the ten western states. In 2016, the percentage was 79.5%. Texas ranked first with 89.7%, while New Mexico fell at the bottom with only 71.1% of students graduating. Within Arizona, Santa Cruz County had the highest graduation rate, with 90.5% of students graduating with their peers. Apache County placed last among Arizona counties, with 73.6% graduating on time.

WHY IS IT IMPORTANT?

Those who do not finish high school are much more likely to be unemployed, and when employed, their earnings fall far below those with a high school degree or higher. This gap can add up to a substantial deficit in earnings over a lifetime. Economic consequences follow through to the community at large with lower wages, less spending power, and the likelihood of higher costs for public assistance. A high school diploma, or its equivalent, is the basic prerequisite to college or trade school.

HOW DO WE COMPARE?

Arizona followed the same general pattern as the U.S. in 2017 with respect to graduation rates by race and ethnic origin. However, In both Arizona and nationwide, more Asian/Pacific Islander students graduated on time than any other race or ethnicity. Arizona had 74.5% of Hispanic students and 73.8% of Black or African American students graduating on time, while nationwide, 80% and 77.8%, respectively, graduated on time. Between the U.S. and Arizona, the largest gap in graduation rates existed for white students.

At 90.5%, Santa Cruz County had the highest percentage of public high school students graduating with their peers in 2017. Maricopa County had only 78.1%, placing it in the bottom quartile among Arizona counties. Pima county ranked 14th out of the 15 counties in Arizona, with 73.8% graduating on time in 2017.

FIGURE 3.2 | HIGH SCHOOL GRADUATION RATES BY RACE AND ETHNICITY (2017)

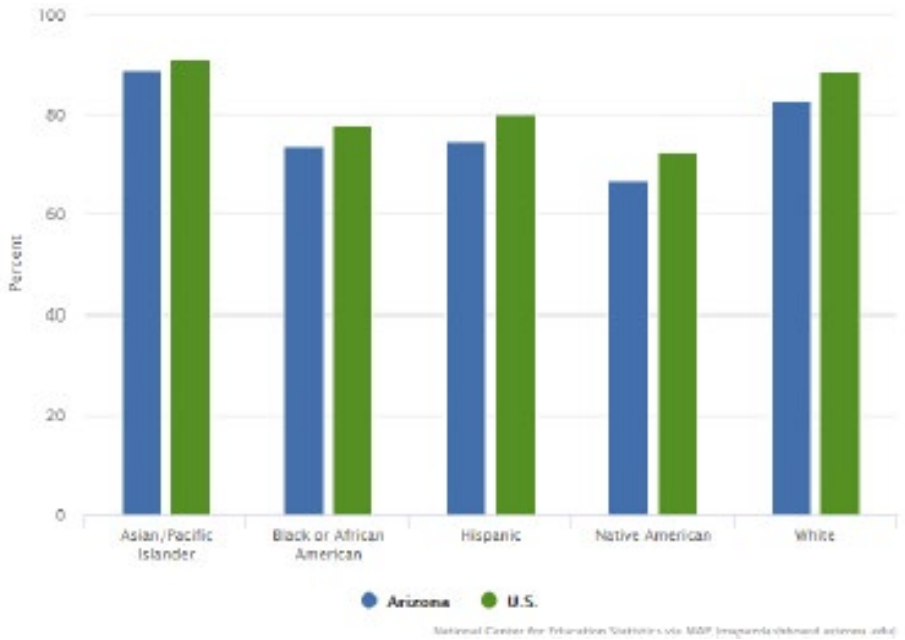


FIGURE 3.3 | HIGH SCHOOL GRADUATION RATE (2017)

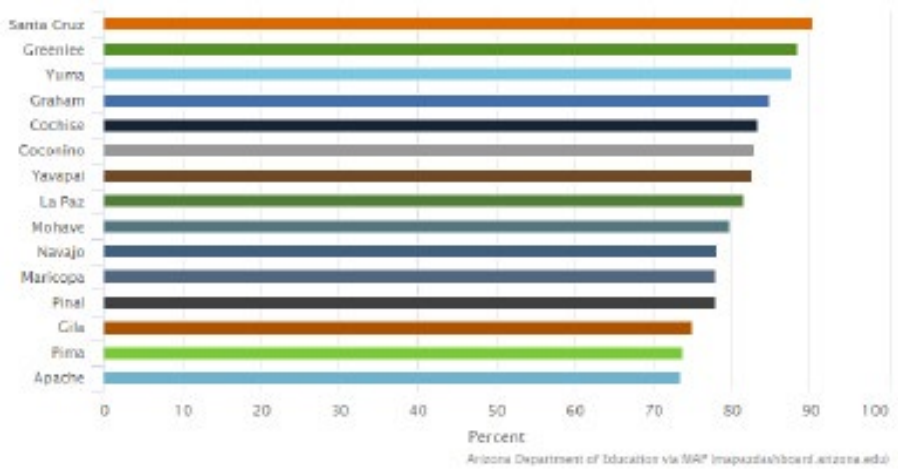
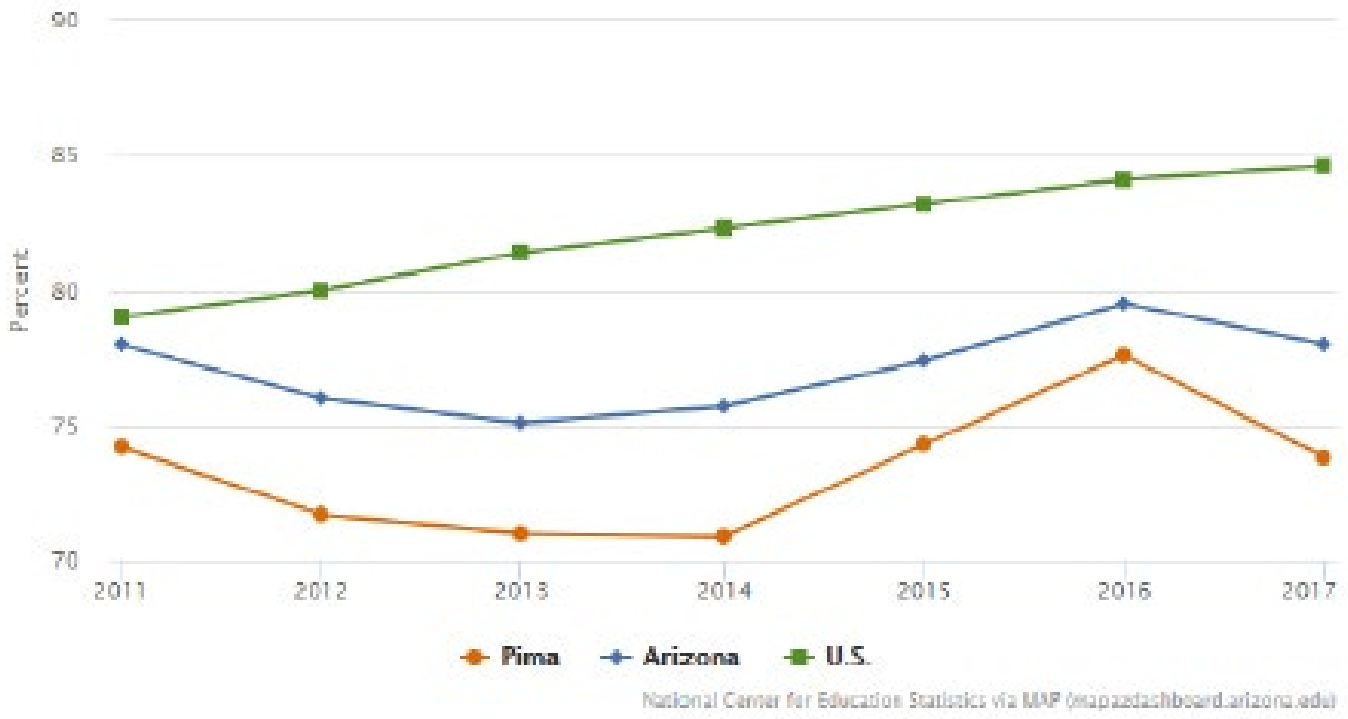


FIGURE 3.4 | HIGH SCHOOL GRADUATION RATE



WHAT ARE THE KEY TRENDS?

The high school graduation rate for the U.S. rose from 79.0% in 2011 to 84.6% in 2017, an increase of 5.6 percentage points over five years. During the same five-year period, the percent of high school students graduating on time in Arizona peaked in 2016 at 79.5% but returned to the same rate posted in 2011.

HOW IS IT MEASURED?

The graduation rate of public high schools is based on the four-year adjusted cohort graduation rate (ACGR). The "cohort" measure of four-year graduation is the share of students who comprise a ninth-grade class and graduate by the fourth year, including transfers into the class, minus those who transfer out and deceased students. For example, those entering ninth grade in the 2008-2009 school year comprise the cohort measured by the 2012 data. State-level graduation rate data comes from the National Center for Education Statistics (NCES). County-level data comes from the Arizona Department of Education. NCES imputed the data from Arizona to come up with the Native American total.

COLLEGE READINESS

In 2019, Arizona ranked fifth in eighth-grade math scores administered by the National Assessment of Educational Progress (NAEP). This placed Arizona students just below the national average in eighth-grade math. In fourth-grade reading, Arizona students also scored lower than the national average. Despite posting a lower than national average score in fourth-grade reading, Arizona's scores have steadily increased since 2005 while the national average has remained mostly constant, thus reducing the achievement gap between Arizona and the nation.

WHY IS IT IMPORTANT?

Standardized test scores are one measure of a region's ability to prepare its youth for the demands of higher education and a career. Creating skilled and productive future workers can benefit the local economy, and maintaining high-quality school systems can attract a talented workforce to the area. In addition to the significant economic effects of developing a young, skilled workforce, good school systems raise an area's desirability from a quality-of-life perspective. Low student achievement means that students may be ill-equipped to attend college or perform high-skilled labor. Low-performing schools also may be indicative of socioeconomic challenges in the community, such as poverty.

FIGURE 3.5 | NAEP SCORES FOR 8TH GRADE MATH (2019)

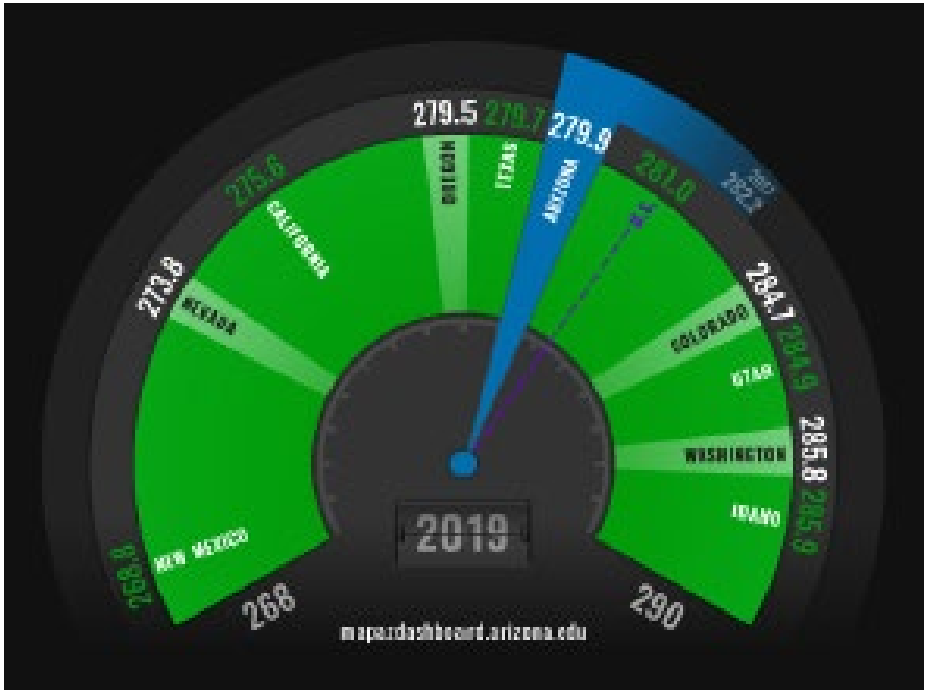


FIGURE 3.6 | PERCENTAGE OF 3RD GRADE STUDENTS WHO SCORED PROFICIENT OR HIGHER ON THE AZMERIT ENGLISH LANGUAGE ARTS TEST (2019)

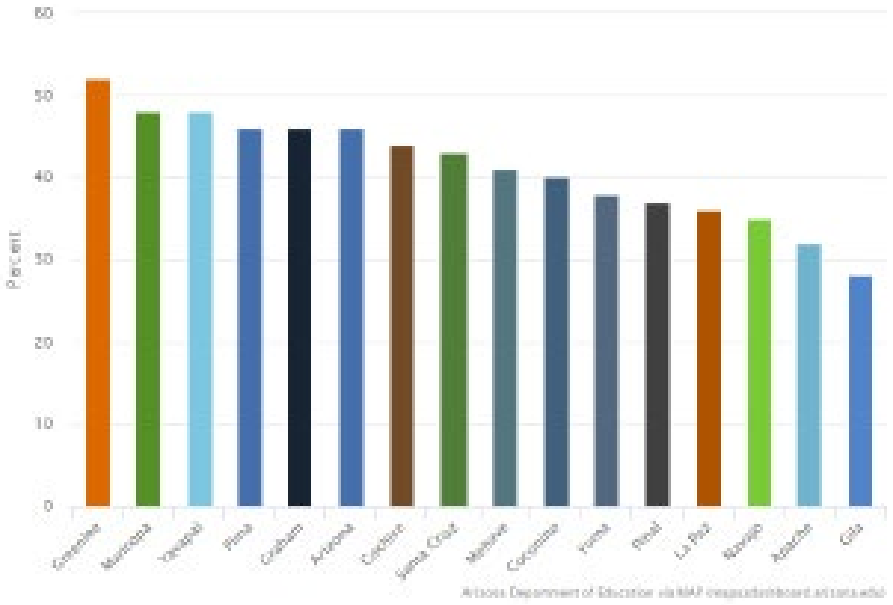
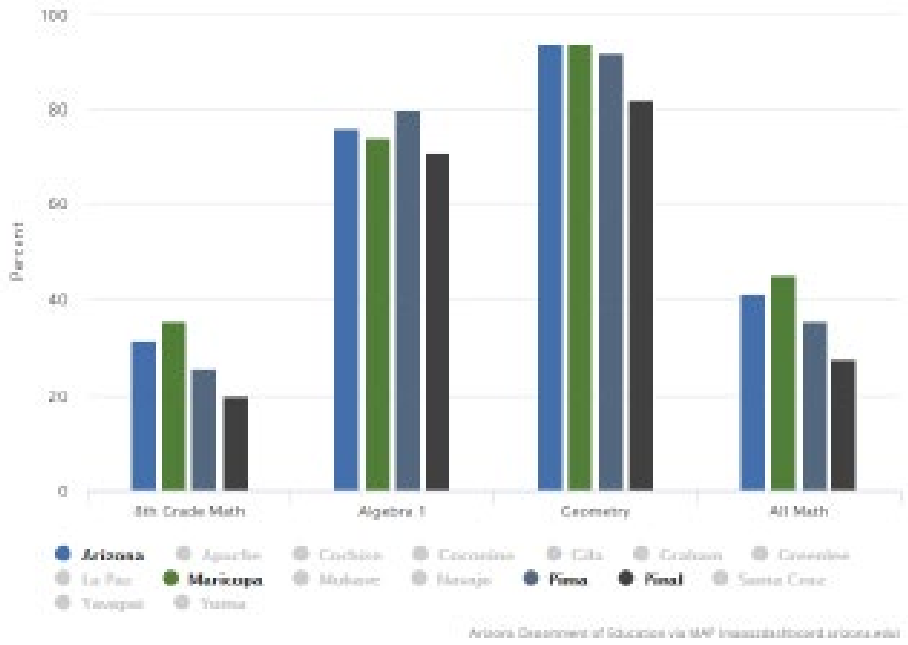


FIGURE 3.7 | PERCENTAGE OF 8TH GRADE STUDENTS WHO SCORED PROFICIENT OR HIGHER ON THE AZMERIT MATH TEST (2019)



HOW DO WE COMPARE?

In English language arts, which tests reading and writing skills, 52% of third-graders in Greenlee County met or exceeded the state proficiency standards. Maricopa and Yavapai counties tied for second with 48%, with Pima County at 46%. Arizona's counties varied substantially. Five counties scored equal to or higher than the state average of 46%. The remaining counties scored in the 20% to 40% range, with no counties scoring below 28%.

Maricopa County was the top performer for students scoring proficient or higher on the eighth-grade AzMerit test at 36%. Both Pima (26%) and Pinal (20%) counties were below the state average of 32%. Apache County had among the lowest scores in English language arts and math, reflecting low test scores among Arizona's Native American students.

Some students in the eighth grade take advanced placement math courses such as Algebra 1 and Geometry. Of the eighth-grade students taking these advanced math courses, a high percentage tested proficient or above.

All math refers to those eighth-grade students who tested proficient or above on at least one of the following assessments: grade 8 math, Algebra 1, Algebra 2, or Geometry.

FIGURE 3.8 | STUDENTS THAT TESTED PROFICIENT OR HIGHER ON AZMERIT BY RACE AND ETHNICITY IN ARIZONA (2019)

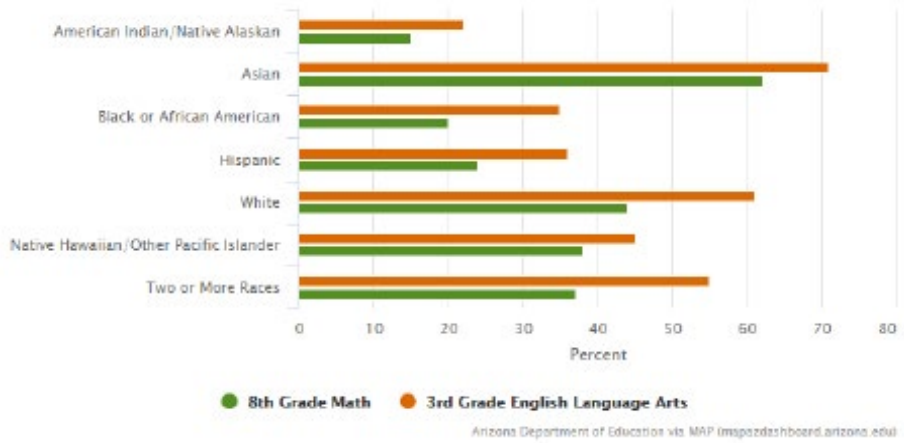
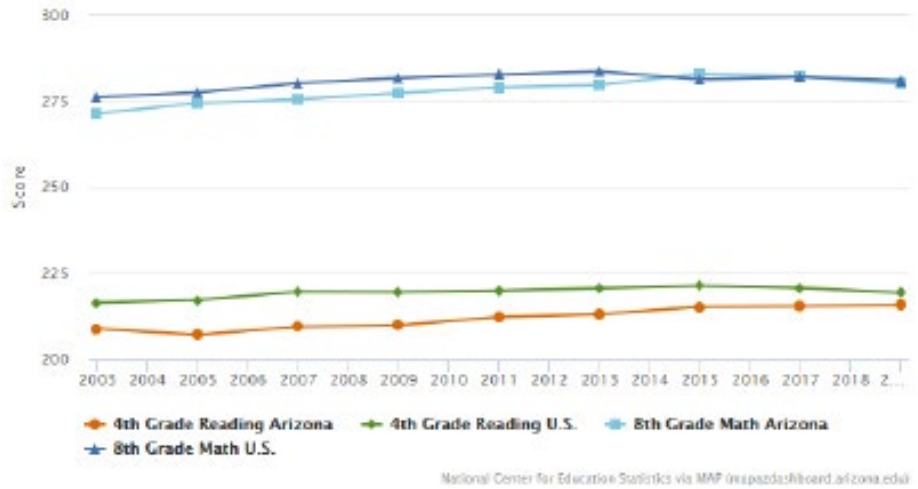


FIGURE 3.9 | NAEP SCORES FOR 4TH GRADE READING AND 8TH GRADE MATH



Scores for Arizona's students varied across race and ethnicity, with all races achieving greater proficiency percentages in third-grade English language arts than eighth-grade math. Asian students achieved the highest rate of proficiency, both in third-grade English language arts (71%), and eighth-grade math (62%). White students achieved the second-highest proficiency rates at 61% and 44%, respectively. Rates for two or more races were six percentage points below whites in third-grade English language arts and seven percentage points below in eighth-grade math. Hispanics and blacks lagged even further behind, as both groups had third-grade English language arts near the 30th percentile and eighth-grade math proficiency rates near the 20th percentile. Arizona's Native American students continue to struggle. Students in this demographic had a 22% proficiency rate for third-grade English language arts and a 15% rate of proficiency in eighth-grade math.

WHAT ARE THE KEY TRENDS?

Between 2003 and 2015, Arizona's academic scores improved more rapidly than the nation, allowing Arizona to surpass the nation in math and gain ground in reading. Math scores for eighth-graders in Arizona rose by a percentage point over the past decade, compared to a decline of .25% for the nation. However, in 2019 math scores in Arizona declined slightly, once again dropping below the nation. Reading scores for fourth graders also improved over the past decade, rising from 210 to 215.8. This 2.8% increase for Arizona compared to a .1% decrease for the nation has reduced the achievement gap between the nation and Arizona, from 9.6 points in 2009 to 3.6 points in 2019.

HOW IS IT MEASURED?

Each fall and spring, Arizona students in the third through eighth grades and high school take the AzMERIT or the Multi-State Alternative Assessment (MSAA) exam. These exams measure students' proficiency in English language arts and math. Percentages reported here represent students who passed the 2019 school year AzMERIT and MSAA test in third-grade English language arts and passed either the AzMERIT or MSAA test in eighth-grade math, meaning that they are proficient or highly proficient in the tested skill. As of 2015, these assessment exams replaced Arizona Instrument to Measure Standards (AIMS) for reading, writing, and math. Unlike AIMS, passing is not a requirement for graduation from high school. National data is used as the average scale scores from the NAEP, an ongoing student assessment program conducted by the National Center for Education Statistics under the U.S. Department of Education.

ACT TEST DATA

ACT testing outcomes are another indicator of college readiness. The 2017 Graduating Class ACT Profile Report summarizes the preparation and performance of 2017 Arizona graduates who took the ACT as sophomores, juniors, or seniors under the standard- or extended-time conditions and achieved a college reportable composite score. The report focuses on student test performance in the context of college readiness. ACT encourages educators to focus on trends (3, 5, 10 years), not year-to-year changes. Such changes can represent normal—even expected—fluctuations. On the other hand, trend lines offer more insight into what is happening in the state.

Furthermore, ACT encourages educators to measure student performance in the context of college readiness measures. The focus should be on the number and percentage of students who met or exceeded ACT's College Readiness Benchmark Scores. This measure is much more meaningful and understandable than an average composite score for a group of students.

ACT's College and Career Readiness Standards are sets of statements intended to help students, parents, and educators understand the meaning of test scores. The standards relate test scores to the types of skills needed for success in high school and beyond. They serve as a direct link between what students have learned and what they are ready to do next. The ACT is the only college readiness test for which scores can be tied directly to standards.

A benchmark score is the minimum score needed on an ACT subject-area test to indicate a 50% chance of obtaining a B or higher, or about a 75% chance of obtaining a C or higher in the corresponding credit-bearing college courses. These courses include English Composition, Algebra, Social Science, Biology, and STEM. These scores were empirically derived based on the actual performance of students in college.

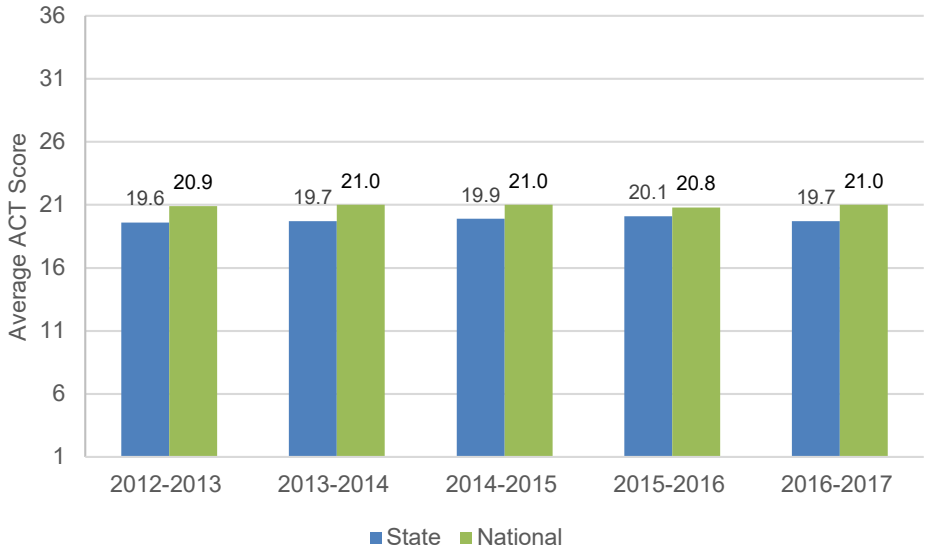
TABLE 3.1

COLLEGE COURSE/ COURSE AREA	ACT SCORE	BENCHMARK SCORE
English Composition	English	18
Algebra	Mathematics	22
Social Sciences	Reading	22
Biology	Science	23
STEM	STEM	26

AVERAGE COMPOSITE SCORE – FIVE YEARS OF TESTING

Average ACT scores are lower for Arizona ACT test takers than those of the U.S. There was a slight reduction in the average scores for the 2016–17 school year. In the 2018 Arizona graduating class, 45,468 graduates (66%) took the ACT test with a Composite score average of 19.2. This compares to 33,999 (55%) with an average of 19.7 in 2016-17. Nationally, 55% of 2018 graduates took the ACT with an average Composite score of 20.8.

FIGURE 3.10 | AVERAGE COMPOSITE SCORES: 5 YEARS OF TESTING



PERCENT MEETING 3 OR 4 BENCHMARKS – FIVE YEARS OF TESTING

Benchmarks are lower for Arizona ACT test takers than those of the U.S. There was a three-point reduction in the average scores between the 2015–16 and 2016–17 school year. In 2018, 12,918 (28%) of Arizona graduates met three or four ACT College Readiness Benchmarks. This compares to 13,238 and 11,039 (31 and 32%) out of 2017 and 2014 graduates, respectively. For reference, the national percentage of 2018 graduates meeting three or four benchmarks was 38%.

FIGURE 3.11 | AVERAGE COMPOSITE SCORES: 5 YEARS OF TESTING

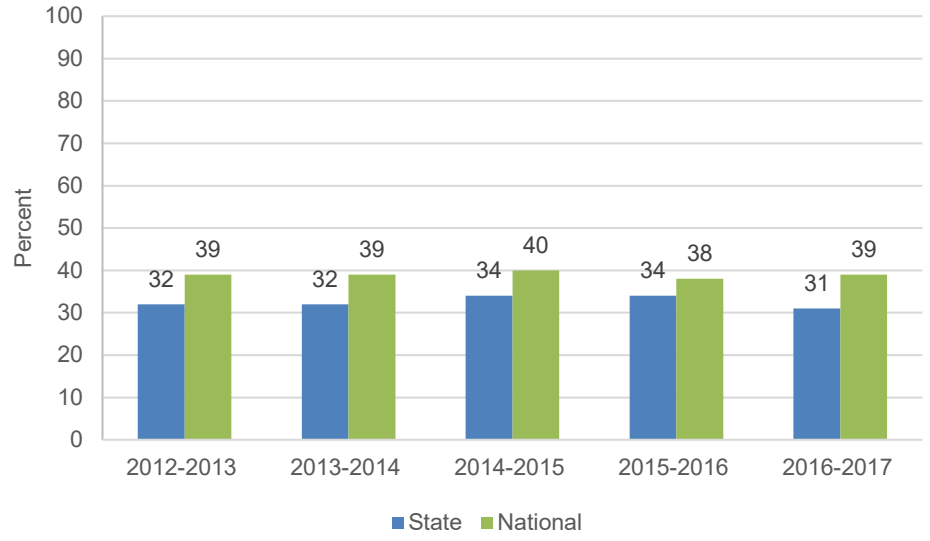
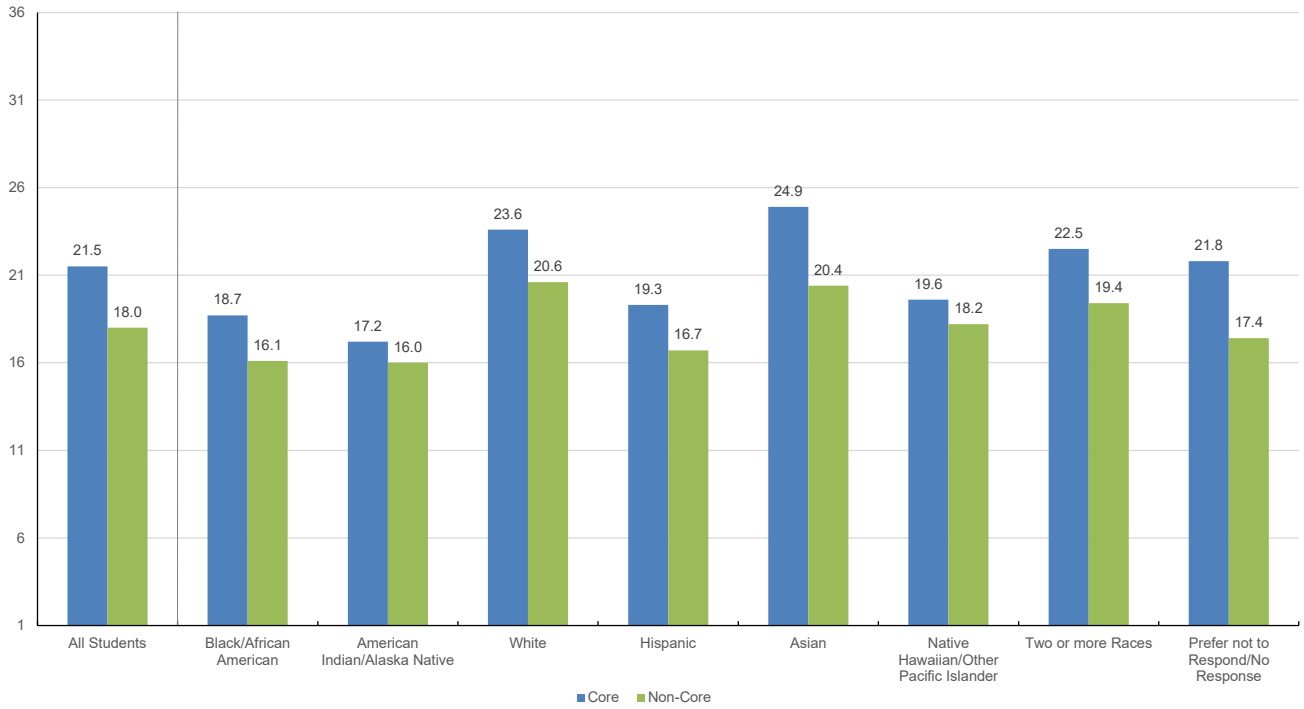


FIGURE 3.12 | AVERAGE ACT COMPOSITE SCORES BY RACE AND CORE CURRICULUM STATUS (2017)



AVERAGE ACT COMPOSITE SCORES BY RACE AND CORE CURRICULUM STATUS

Results are noted for the 2017 graduating class, which included testing of 42,232 Arizona students. Core results correspond to students taking four or more years of English AND three or more years each of math, social studies, and natural science.

First, core students had a higher average score than non-core students. Second, there are differences in composite scores between races in the core and non-core categories.

WHY IS IT IMPORTANT?

While community colleges are open-access institutions, ACT scores reflect recent high school graduates' skills and abilities and their possible need for developmental or study skills before starting college-level coursework. Differences in college readiness by race suggest that academic success centers must be prepared to implement various strategies and programs to ensure effective onboarding and student success.

CHAPTER 4 BEST PRACTICES FOR MSI AND HSI INSTITUTIONS

FOCUS AREA:

As the United States population becomes more racially and ethnically diverse, the academic success of minority / Hispanic students in higher education is increasingly important. One key institutional segment that serves large proportions of first-generation students is Minority-Serving Institutions (MSIs).

Five hundred twenty-three institutions met the federal enrollment criterion as Hispanic Serving Institutions or HSIs in 2017. These institutions enroll 66% of all Hispanic undergraduates. A majority of HSIs are in urban areas and are concentrated geographically, with 83% of these institutions located in six states. Nationally, 3.5 million Hispanics were enrolled in non-profit higher education colleges in 2017, with 46% of Hispanic undergraduate students attending two-year institutions.

This chapter highlights how specific policies and faculty-driven, classroom-based practices at MSIs and HSIs can better support first-generation and underrepresented students' academic and social success.

SUMMARY OF FINDINGS:

- MSIs served 41% of underrepresented students totaling approximately 3.8 million students or 26% of all college students in 2017.
- Arizona ranked fifth in the number of Hispanic residents in the 15 to 19 age category. By 2029, the number of Hispanics in this category is expected to decline by more than 11,000 residents.
- For the U.S. to top the list of nations with college-degree recipients, Latinos will need to earn 6.1 million more degrees by 2020, according to the U.S. Department of Education. Currently, only 22% of Latinos ages 25 and older have an associate degree or higher, compared to 39% of all U.S. adults.
- In Maricopa County, there is a significant disparity between Hispanic and non-Hispanic degree holders (89% vs. 11% respectively). This disparity warrants MCCCD institutions to review HSI best practices.
- Excelencia in Education, a national organization, draws on their experience in identifying and developing promising practices for increasing graduation and Latino college students' long-term success. Multiple examples of best practices have proved to be effective in HSI institutions.

QUESTIONS FOR THIS FOCUS AREA:

- What MSI and HSI strategies are working at your institution? Are there other best practices you can adopt or adapt to your institution based on this review?
- How will these future strategies impact college operations? Are there space or staffing considerations that need to be addressed in the district-wide campus master plan?

INTRODUCTION

As the United States population becomes more racially and ethnically diverse, the academic success of minority students in higher education is increasingly important. It is estimated that by the year 2020, approximately 43% of the total U.S. population will be comprised of minority populations, extending to about 57% by the year 2050 (U.S. Census Bureau, 2017).

One key institutional segment that serves large proportions of first-generation students is Minority-Serving Institutions (MSIs). This institutional segment is comprised of Historically Black Colleges and Universities (HBCUs), Hispanic Serving Institutions (HSIs), and Tribal Colleges and Universities (TCUs). The segment has a legacy of providing increased access to some of the nation's underserved students and often have innovative practices and strategies to support stronger student success. Their work with first-generation students is an important component to achieve these broader educational and societal goals. This chapter seeks to highlight how specific institutional policies and faculty-driven, classroom-based practices at MSIs can change to better support first-generation students' academic and social success.

The important role of MSIs is further highlighted by the fact that in 2017 these institutions served 41% of underrepresented students totaling approximately 3.8 million students or 26% of all college students. Overall, the students served by the various MSIs share certain characteristics: they are mostly low income, predominantly women, more likely to be employed full-time, more likely to live at home, more likely to enroll part-time, and more likely to require developmental education. Also, a higher proportion of MSI students are first-generation compared to students enrolled at Predominantly White Institutions (PWIs).

MSIs help address these challenges by creating environments and curricula that better meet underrepresented students' needs. For example, attending an MSI is found to increase underrepresented students' self-esteem, help identity formation processes, improve critical thinking skills, increase leadership opportunities, and help better engage students in the classroom, ensuring students' persistence through college.

The majority of MSIs face common challenges that affect their ability to efficiently and effectively conduct an assessment to better serve their student populations and meet demands for accountability and transparency. Perhaps the largest issue is fiscal, which leaves most MSIs underfunded, understaffed, and with facilities in need of repair.

Despite their important role in fostering the success of the students they serve, there is little scalable research on the best practices of MSIs with little known specifically about assessment or best practices. Collecting and using assessment data are essential steps in determining the efficacy of student success efforts. A better understanding of a student learning outcomes assessment at MSIs can provide instructive information for benchmarking practices.

HISPANIC POPULATION DATA AND HISPANIC SERVING INSTITUTIONS (HSIS)

According to the Hispanic Association of Colleges and Universities, there are 59.1 million Hispanics in the U.S. in 2018, plus 3.3 million in Puerto Rico. They represent 18.1% of the U.S. population with a median age of 28. Hispanics are almost a decade younger than the U.S. population, with a median age of 35 and younger. In 2016, U.S. born Hispanics accounted for 81% of Hispanics ages 35 and younger.

Nationally, 9.5% of Hispanics 25 and over have not completed high school, compared to 5.9% of non-Hispanic whites. In 2017, 17.2% of Hispanic adults in the U.S. had at least a bachelor's degree, compared to 53.9% of Asians, 38.1% of Non-Hispanic Whites, and 24.3% of African Americans. Simultaneously, 67% of Hispanic recent high school graduates ages 16-24 were enrolled in college in 2017, compared to 69% for whites.

In reviewing Table 4.1, Arizona is ranked fifth in Hispanic residents in the 15 to 19 age category. By 2029, the number of Hispanics in this category is expected to decline by more than 11,000 residents. This is due in part to declines in net migration and natural births.

TABLE 4.1 | HISPANIC POPULATION: TOP TEN STATES, AGES 15-19

State Name	2019 Population	2029 Population	Change	2019 % of population	2029 % of Population
California	1,291,727	1,231,674	(60,053)	3%	3%
Texas	1,008,695	1,007,464	(1,231)	3%	3%
Florida	384,623	450,781	66,158	2%	2%
New York	267,506	290,618	23,112	1%	1%
Arizona	**206,568**	**195,076**	**(11,492)**	**3%**	**2%**
Illinois	202,743	180,331	(22,412)	2%	1%
New Jersey	139,555	163,345	23,790	2%	2%
Colorado	113,098	106,591	(6,507)	2%	2%
North Carolina	98,935	110,554	11,619	1%	1%
Georgia	97,951	106,637	8,686	1%	1%

Source: U.S. Census Bureau

TABLE 4.2 | 2019 EDUCATIONAL ATTAINMENT BY RACE/ETHNICITY (AGE 25 OR OLDER) | MARICOPA COUNTY

Race/Ethnicity	Population	Less Than High School	High School Diploma	College Degree
White, Non-Hispanic	1,847,819	94,143	896,835	856,842
Black, Non-Hispanic	157,037	15,930	85,356	55,751
American Indian or Alaskan Native, Non-Hispanic	46,116	8,311	25,394	12,411
Asian, Non-Hispanic	139,261	17,776	33,735	87,751
Native Hawaiian or Pacific Islander, Non-Hispanic	5,835	642	3,387	1,806
Two or More Races, Non-Hispanic	41,118	5,098	19,243	16,777
Non-Hispanic Subtotal	**2,237,187**	**141,900**	**1,063,949**	**1,031,338**
Non-Hispanic %	**74%**	**34%**	**75%**	**89%**
White, Hispanic	699,783	255,285	323,477	121,021
Black, Hispanic	17,946	6,537	8,297	3,112
American Indian or Alaskan Native, Hispanic	25,998	9,494	12,016	4,487
Asian, Hispanic	7,330	2,672	3,389	1,269
Native Hawaiian or Pacific Islander, Hispanic	2,361	862	1,091	407
Two or More Races, Hispanic	14,405	5,249	6,660	2,496
Hispanic Subtotal	**767,823**	**280,100**	**354,930**	**132,794**
Hispanic %	**26%**	**66%**	**25%**	**11%**
Total Population	3,005,010	422,000	1,418,878	1,164,132

Source: American Factfinder, U.S. Census

As noted in Table 4.2, 26% of residents, age 25 and older, in the Maricopa County area identified themselves as Hispanic in 2019. Of those 25 and older, 66% of Hispanics have less than a high school degree, compared to non-Hispanics, with 34% not having a high school degree. There is a significant disparity between Hispanic and non-Hispanic degree holders (89% vs. 11% respectively). This disparity warrants MCCCD institutions to review HSI best practices.

Nationally, 3.5 million Hispanics were enrolled in non-profit institutions in 2017, with 46.0% of Hispanic undergraduate students attending two-year institutions (compared to 34% of all white undergraduates). In 2017, 523 institutions met the federal enrollment criterion as an HSI, enrolling 66% of all Hispanic undergraduates. A majority of HSIs are in urban areas and are concentrated geographically, with 83% of these institutions located in six states and one territory, including California, Texas, Florida, New York, Illinois, New Mexico, and Puerto Rico. HSIs have grown by 334 institutions since 1994 and have averaged an increase of 30 institutions per year since 2009.

STRATEGIES AND BEST PRACTICES

This chapter summarizes some of the more recent best practices in MSI and HSI institutions by reviewing secondary literature sources. No attempts were made to contact institutional representatives to validate outcomes or assessment activities related to student success or learning.

Some best practices included:

- Institutional Interventions
- Career Pathways
- 2+2 Articulation with four-year colleges
- Peer Mentor programs
- Faculty development seminars
- Department student science awards
- Research Symposium
- STEM research course credit/ Research program
- Reading Center/Lab
- Learning Communities (non-residential
- Program for first-generation students
- Early Warning system
- Comprehensive learning assistance center/lab
- Advising interventions for selected student populations
- Appreciative/Intrusive Advising Model
- Co-Enrollment Collaboration Grants
- Pathways Programs

Many of these practices served a small number of students and were not scalable to a larger population or were developed as part of a grant or funding initiative. Several that seemed to be relevant for MCCCD institutions were selected for inclusion in this chapter.

OPEN EDUCATIONAL RESOURCE INITIATIVE

A college-wide open educational resource initiative helps MSIs reduce attendance costs for students struggling to meet college expenses. Some individual MSI faculty already use them in various academic disciplines with great success. With a recent grant, Pima Community College is scaling this initiative at the college level. Faculty members are empowered to select their course material without being bound to traditional textbook publisher course content. Faculty members can also keep course content relevant from one semester to the next by using frequently modified and updated open educational resources.

A considerable number of open educational resources are readily available online. However, it may be useful for institutions to provide both funding and professional development to train instructors on designing and implementing OER course material effectively across the curriculum. Moving forward, MSIs are encouraged to explore this cost-effective approach to reducing students' cost of attendance by working together collectively through partnerships and collaboration between MSIs.

ASSESSMENT

MSIs are more likely than non-MSIs to use incoming placement exams to determine student pre-college achievement levels and to use classroom-based assessments or in-class assignments such as simulations, comprehensive exams, and critiques. MSIs are also less likely than non-MSIs to use national student surveys such as the National Survey of Student Engagement (NSSE) and/or First Year Experience Survey, as well as alumni surveys. Further, MSIs are more likely to engage in locally developed surveys and measures over externally situated ones. Best practices suggest that MSIs have (1) internally focused support structures for their assessment endeavors and enhanced professional development opportunities for student affairs staff, (2) funds targeted for assessment, assessment management systems and software, and (3) recognition/rewards for faculty involvement supporting assessment.

CHOKEPOINTS IN THE CURRICULUM

North Seattle Community College (NSCC) noticed that too few working adults—many of them low-income students of color—were not completing the certificates and degrees that they needed to advance at work. The problem was, in part, a data problem: students, staff, and faculty needed to understand what barriers emerged throughout a program and to build new systems to make modifications and develop new strategies.

As part of an innovative nursing program funded by a Careers for All grant, the College established a collaborative instructional team—including instructors, institutional researchers, tutors, and mentors—to review multiple student progress indicators. Each week, the team considers quantitative and qualitative measures collected in computerized grade books and a developing case-management database to adjust the pace of instruction, add additional sources of support, and guide conversations in weekly meetings between students and a mentor. Early results show quarter-to-quarter retention rates of over 90%.

COLLEGE READINESS AND EARLY COLLEGE HIGH SCHOOL

One of the nation's largest two-year colleges, El Paso Community College (EPCC) has implemented several innovations that have helped many economically disadvantaged and first-generation students successfully move through developmental education classes to the core courses and then on to college completion. Two of these are notable.

The first, the College Readiness Initiative, redesigns the traditional pathway to college for high school students who need additional preparation before enrolling in college-level courses. This initiative combines a "high-tech" pathway with "high-touch" networks of support through the enrollment process. Computer-based assessments of students' college readiness provide detailed data about what they need to learn to start the semester in college-level English and math classes; these assessments are linked to courseware that guides them to become college-ready. This "high-tech" process is facilitated by a network of counselors, advisors, and tutors who explain the enrollment process to students and help them use an array of EPCC resources to get ready for college.

The second program, the Early College High School (ECHS) initiative, is anchored in partnerships between EPCC and surrounding school districts. ECHS gives eighth graders the chance to join a high school with a strong college-going culture and access to dual-credit classes in their high school and college classes at a co-located EPCC campus. ECHS staff and teachers guide students in getting ready for college, and the ECHS experience—including a curriculum that is completely aligned with the curriculum at EPCC and regional four-year colleges. This leads many students to finish their first two, and sometimes three, years of college by the time they graduate from high school.

EXAMPLES OF BEST PRACTICES IN HSIS

Increasing college completion among Hispanics is critical to the U.S. as their population continues to grow. For the U.S. to top the list of nations with college-degree recipients, Latinos will need to earn 6.1 million more degrees by 2020, according to the U.S. Department of Education. Currently, only 22% of Latinos ages 25 and older have an associate degree or higher, compared to 39% of all U.S. adults.

Excelencia in Education, a national organization, draws on their experience in identifying and developing promising practices for increasing graduation and Latino college students' long-term success. Excelencia works with institutions to build up their capacity and better use internal resources at their disposal. To earn recognition for best practices, institutions must show momentum in three core areas:

- **Robust and accurate data systems.** Institutions must show their commitment to Latino enrollment, retention, financial support, and graduation, as well as Latino representation among administration, faculty, and staff.
- **Consistent, transparent use of evidence-based practices.** Colleges and universities must quantitatively and qualitatively show positive impact over several years of practices that yield Latino student success.
- **Strong, committed leadership.** Institutions demonstrate the public commitment of their president/chancellor and board to improving Latino student success, including creating and executing a strategic plan and ensuring that practices and policies are aligned with current data.

The following are recognized examples of best practices that have proved to be effective in HSI institutions:

CABRILLO COLLEGE | CALIFORNIA

ACADEMY FOR COLLEGE EXCELLENCE (ACE)

OVERVIEW

ACE brings students who are unprepared for college and the workforce into community college and allows them to reevaluate their educational experience, using a unique combination of methods based on corporate executive training models not usually found in academic programs. Started at Cabrillo College at its Watsonville campus serving over 90% Latino students, the ACE Program currently has seven programs at community colleges across the nation.

PROGRAM DESCRIPTION

ACE is a semester-long program that aims to bring underprepared and Latino students up to college-level performance quickly. It offers students an opportunity to bypass some of the lengthy remedial process, which helps develop their identity as successful college students. The ACE program addresses self-efficacy and affective issues that hold students back and helps students adopt more effective classroom behavior. The cohort-based ACE model incorporated integrated coursework, community-based social justice primary research, experiential pedagogy, peer student support, strength-based learning, and teamwork.

OUTCOMES

Latino students make up 58.7% of the ACE population of students whose results were analyzed and reported. This report is based on 894 ACE participants and 123,631 non-participants enrolled in Cabrillo College, Hartnell College, Los Medanos College, and Berkeley City College in fall 2010, spring 2011, and fall 2011 semesters. ACE participants in accelerated programs were considerably more likely to pass degree-applicable English in the ACE semester, and this difference is still apparent two semesters later.

They are also considerably more likely than comparable non-participants to complete transfer-level English (148% more likely), and they earn 7 to 10 more degree-applicable credits than comparable non-participants. Completion of transfer-level math is equally as effective, though this was of a pilot of the math acceleration model of only 55 students over three semesters. Also, accelerated ACE participants were more likely than comparable non-participants to enroll full time in the semester following the ACE semester, enabling them to earn credits more rapidly.

CERRITOS COLLEGE | CALIFORNIA

COMMUNITY PARTNERSHIPS / COLLECTIVE IMPACT

OVERVIEW

Cerritos Complete, a California College Promise program, is a student success initiative that focuses on the students' pledge to earn and complete their degrees or certificates on time. Cerritos Complete is a partnership between Cerritos College and six local school districts.

The program aims to increase the number of students who complete their math and English/ESL requirements early, provide comprehensive education planning, and ensure timely degree completion.

More than a Promise program marries academic and student services, removing barriers to college access with personal, academic, and financial support. The academic success of Latinos is critical to the nation's economy, and the college was mindful of the needs of Latino students when devising Cerritos Complete and its strategies.

Benefits include:

- Two-year free tuition
- Two-year early enrollment
- Step by step assistance
- One-on-one counseling and advisement
- College preparedness
- Career exploration
- Personalized schedule for Fall and Spring semesters

PROGRAM DESCRIPTION

The program's success is rooted in strong partnerships and how this collaboration connects college-bound students with resources while in high school. Through student-centered dialogue, a program called K-16 Bridge allows students to connect with the College before graduation and receive high-touch services to prepare them for college. Cerritos College made a significant investment to support this effort and created a new department to manage the partnerships and coordinate support services. In Year One, three districts were formal partners. Success during this initial year prompted the rest of the districts to join in Year Two. The College President and Board of Trustees targeted local funding to expand the K-16 Bridge to the College's Promise Program, rebranded as Cerritos Complete. This also allowed eligible access to promise scholarships.

OUTCOMES

The first cohort included 242 Freshman (184 Latino) in 2015 and 518 Freshman (350 Latino) in 2016. Cerritos Complete students were enrolled full-time at a higher rate than the College student body as a whole (78% to 29%). They also complete more credit units quicker than other students: 91% are enrolled in at least nine credits, compared to 45% for all Cerritos College students.

More Latino participants have developed educational plans than non-participants (+8%), and more complete their entry-level math (+40%) and English (+11%) coursework. Data shows that 75% persisted into the first semester of their sophomore year, compared to 47% for the first-time enrollment cohort.

COLLEGE OF THE DESERT | CALIFORNIA

FIRST YEAR SUPPORT SERVICES – SUMMER BRIDGE PROGRAM

OVERVIEW

The Engage, Develop, Grow, Empower (EDGE) program aims to increase student success and mitigate achievement gaps in access, basic skills, retention, persistence, and completion. To achieve this mission, the EDGE program provides students with a structured onboarding process to help eliminate confusion during the matriculation process. The program consists of a three-week summer bridge designed to reduce pre-collegiate coursework and first- and second-year comprehensive wraparound support services to increase success and persistence and financial support to eliminate barriers.

PROGRAM DESCRIPTION

EDGE: Engage, Develop, Grow, Empower is a three-week program offering a fast-paced review of basic skills in math and English/reading. Students attend a rigorous review of subject-specific content and counseling sessions, learn about campus resources and special programs, and build lasting connections. At the end of the program, students retake the placement test with the opportunity to remove some, or all, of the basic skills courses required to enroll in college-level courses.

The program provides EDGE students with first- and second-year support services, including student success coaching, financial aid assistance, peer mentoring, follow-up calls, early alert monitoring, and counseling. Students are offered three workshops during the semester focusing on transfer, career, time management, and study tips. The College recently created a sister program to EDGE in 2017 called plEDGE. plEDGE offers incoming students free tuition and fees for two years to remove the financial barriers many students face.

OUTCOME

EDGE students persist from fall to spring at higher rates than non-EDGE students. In 2012 EDGE persistence rates were 81% compared to non-EDGE students 77%. In 2013, the rate was 91% to 75%, while in 2014, persistent rates went from 88% for EDGE students and 79% for non-EDGE students.

Comparing persistence rates of Hispanic first-time students who completed EDGE to Hispanic first-time college students who did not complete EDGE, the results show Hispanic EDGE students persist at higher rates. 95% compared to 77% in 2013, 88% to 79% in 2014, and 85% to 77% in 2015.

Since 2012, the Hispanic/Latino student headcount increased by 36%. In EDGE 2016, 87% are Hispanic/Latino compared to 69% for the general student population. Of the total students completing the placement exam in fall 2012, 92% placed in pre-collegiate math, 82% in pre-collegiate English, and 73% in pre-collegiate reading. Since 2012, pre-collegiate course requirements have been reduced by 2,812.

EL PASO COMMUNITY COLLEGE | TEXAS

DUAL DEGREE/DUAL CREDIT/EARLY COLLEGE HIGH SCHOOL, - PATHWAY/PIPELINE

OVERVIEW

El Paso Community College's (EPCC) Dual Credit and Early College High School (ECHS) program's mission is to provide higher education access and support for the underserved, majority Latino student population by providing access to college level coursework to high school students. EPCC waives tuition and fees and ensures all faculty are fully credentialed to teach college courses; K-12 partners provide textbooks, transportation, and school operations. Integrated, mandatory services designed to meet students' needs and support program goals include bridge camps, tutoring, advising, and social supports. The program aims to increase college enrollment, post-secondary matriculation, and completion, and the number of high school faculty credentialed to teach college courses.

PROGRAM DESCRIPTION

In 2013, the program was created to address the majority Latino region's high poverty rate and low educational attainment compared to Texas and the nation. Currently, 28% of this region's population has completed an associate degree or higher, and 25% do not have a high school diploma. EPCC leveraged resources to launch the program and committed to provide the program free to students.

Necessary student support and practices include tutoring and intrusive advising and joint EPCC and high school faculty training. The program began by offering dual credit courses in a few high schools mostly taught online by EPCC faculty, with a total of 502 students served, 78% Latino. The number of students served has grown over 16 times to 8,146 students, 83% Latino. The program targets students by focusing on feeder patterns with predominantly Latino populations, engaging families, and highlighting successful Latino program students. Alignment of students' pathways to EPCC and University of Texas El Paso is now emphasized.

OUTCOME

Of high school students who did not participate in the program, only 33% enroll within one year to higher education institutions. EPCC's overall four-year full-time graduation rate is 21.6%, its 6-year rate is 30%, and its transfer rate is 24%. Of students enrolling at EPCC:

- 70% are not considered college-ready.
- On average, 58% of Dual Credit students enroll at EPCC within one year of high school graduation
- Dual credit students have a one-year persistence rate of 82.7% and, on average, 63% complete an associate or baccalaureate degree within five years
- When looking at overall completion and transfer rates for both ECHS and Dual Credit:
- ECHS five-year associate completion rate is 74%, and 86% for Latinos in the program
- For the First Time In College (FTIC) 2012 cohort, Dual Credit students have a 5-year transfer rate of 47%. ECHS students have a 5-year transfer rate of 44%. Compared to students who are not part of either program who transfer from EPCC to a 4-year is 22%.

CITY UNIVERSITY OF NEW YORK'S (CUNY) COMMUNITY COLLEGES

ACCELERATED STUDY IN ASSOCIATE PROGRAMS (ASAP)

OVERVIEW

City University of New York's (CUNY) Community Colleges launched Accelerated Study in Associate Programs (ASAP) in 2007 to improve low graduation rates. ASAP provides wraparound services to students selected at six CUNY community colleges. The ASAP expansion at Bronx Community College (BCC) is a redesign of an entire college by expanding a very successful program. About 90% of ASAP students receive full financial aid, and 85% enter the program with at least one developmental education course. The ASAP theory of action includes removing financial barriers for students who enroll full-time, providing structured degree pathways and comprehensive support services, establishing clear expectations for students, building community through early engagement, a cohort model, and block scheduling. The coordination of these features, within a clear degree completion context, helps ASAP increase student success.

PROGRAM DESCRIPTION

The mission is to graduate at least 50% of its students within three years. ASAP provides students with a battery of comprehensive services delivered with a clear degree completion strategy, guided by three principles: maintaining academic momentum, achieving a successful student integration in the institution, and removing institutional difficulties by building "guided pathways." The program objectives are: (1) To support full-time study and consistent credit accumulation, (2) To address financial and academic barriers to persistence and completion, (3) To foster a sense of community, and (4) To develop close advisor/ student relationships by which students can develop academically, personally, and professionally.

OUTCOMES

The ASAP office includes an evaluation team that analyzes program outcomes and provides actionable data. For each ASAP cohort, the evaluation team constructs a comparison group (CG) of comparable non-ASAP students. Also, ASAP conducts yearly student surveys and focus groups. The program has established retention and graduation benchmarks as well as advisor/ student meeting frequency benchmarks. The effectiveness of ASAP at BCC is as follows:

- Retention from Semester to semester: ASAP students = 93%, CG = 84%
- Year to year: ASAP students = 81%, CG = 66%
- Graduation: Three-year rate: ASAP students = 54%, CG = 18%
- Transfer: Enrolled in bachelor's program: ASAP students = 59%, CG = 50%
- Earned BA degree in six years: ASAP students = 27%, CG = 8%

ALAMO COLLEGES DISTRICT | SAN ANTONIO, TEXAS

ALAMOADVISE

OVERVIEW

The Alamo Colleges District is comprised of five colleges that serve approximately 60,000 students, of which 62% are Latino. A focus on increasing student success for their majority "minority" students, which reflects the community they serve, led to a redesign of the student experience. AlamoADVISE, an intrusive, intentional case management model, was launched to facilitate and support student transition from outreach to credential completion. The model requires certified advisors and students to meet at designated touch-points to monitor progress, identify challenges, and design strategies to maintain momentum to completion and transfer/ employment. Advisors are trained in holistic advising to support the individual student needs, including developing individual success plans and implementing strategies to support Latino students who often face access and completion barriers.

PROGRAM DESCRIPTION

Collaborative teaching and learning in advising empower diverse student populations to explore and navigate their academic/career pathways. Adoption of "advising as teaching" allows advisors to give students an advising syllabus outlining Student Learning Objectives (SLOs) and the student's responsibility for success. The model is designed to provide a student with a personalized pathway through academic/career advising, resulting in completing a credential.

Program goals include:

- Attaining a student to advisor ratio of 1:350 in five years
- Ensuring each student has an assigned advisor by achieving a caseload of 99%.
- Ensuring all advisors complete competency-based training within one year of employment
- Increasing fall to spring and fall-to-fall persistence
- Increasing certificate/degree completion.

OUTCOMES

The program goals of advisor to student ratio, case loading, and advisor training are being met and demonstrate positive results related to Latino student success in persistence and completion. The student to advisor ratio of 1:350 within five years increased fall to spring persistence for all students remained fairly steady for the past three years, at 77.4% to 78.1%. Latino student persistence for that same period also remained fairly steady but exceeded all students at 78%. Fall-to-fall persistence for the past three years has increased for all students from 56% to 58%. Total degrees and certificates awarded between FY2013 and FY2016 have increased from 6,371 to 12,009, increasing by 88%. In that period, the percentage of Latino students completing a credential has increased from 56% to 62%.

LAREDO COMMUNITY COLLEGE | LAREDO, TEXAS

FOCUS ON STUDENT SUCCESS (FOSS)

OVERVIEW

Focus on Student Success (FOSS), a Title V Cooperative Development Grant, is the result of years of teamwork. FOSS was created to provide students support in their crucial first year of college, setting the expectation for academic success, transfer, and graduation to pass gatekeeper courses at LCC. It includes a Summer Bridge experience, which focuses on academics, engagement, and financial literacy. Throughout the year students receive advising, tutoring, and mentoring. Since their second summer, the program has used a central theme based on popular culture, consistent use of media, and gamification has raised positive awareness and interest in the program. This year the Game of Thrones book and series was the theme of the Summer Bridge for the entire college. Based on strong results the practices have been embraced, emulated, and institutionalized.

PROGRAM DESCRIPTION

The goal is to retain, transfer, and graduate students with a bachelor's degree. The program has four crucial components to improve post-secondary student success:

- Ensure student success at intake and transfer by establishing activities to bridge the transition from high school and to ensure a seamless transfer to a bachelor's degree.
- Increase student success in gatekeeper courses through enhanced student services and increased faculty development training.
- Develop and implement a Model Transfer Program to help students overcome barriers.
- Use data to improve decision making to reach goals and to document project and student success.

OUTCOMES

Students receiving services at the college and their transfer university are now beginning to transfer and persist successfully. For the first year, first attempt pass rates (A, B, C) in gatekeeper courses at LCC were at least 20% higher than for the general college population. By the third-year pass rates were 90%-100%: Persistence rates for years 2013-2015 were 70%, 83%, and 85% respectively. Transfer rates have increased by 47%, compared to the 14% baseline.

MIAMI DADE COLLEGE(MDC) | MIAMI, FLORIDA

MDC'S SHARK PATH RETENTION PROGRAM

OVERVIEW

Focus on Student Success (FOSS), a Title V Cooperative Development Grant, results from years of teamwork. FOSS was created to provide students support in their crucial first year of college, setting the expectation for academic success, transfer, and graduation to pass gatekeeper courses at LCC. It includes a Summer Bridge experience, which focuses on academics, engagement, and financial literacy. Throughout the year, students receive advising, tutoring, and mentoring. Since their second summer, the program has used a central theme based on popular culture, consistent use of media, and gamification has raised positive awareness and interest in the program. This year the Game of Thrones book and series was the theme of the Summer Bridge for the entire College. Based on strong results, the practices have been embraced, emulated, and institutionalized.

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- Ensure student success at intake and transfer by establishing activities to bridge the transition from high school and ensure a seamless transfer to a bachelor's degree.
- Increase student success in gatekeeper courses through enhanced student services and increased faculty development training.
- Develop and implement a Model Transfer Program to help students overcome barriers.
- Use data to improve decision making to reach goals and to document the project and student success.

OUTCOMES

Students receiving services at the College and their transfer university are now beginning to transfer and persist successfully. For the first year, first attempt pass rates (A, B, C) in gatekeeper courses at LCC were at least 20% higher than for the general college population. The third-year pass rates were 90%-100%: Persistence rates for 2013-2015 were 70%, 83%, and 85%, respectively. Transfer rates have increased by 47%, compared to the 14% baseline.

MT. SAN ANTONIO COLLEGE | CALIFORNIA

SUMMER BRIDGE PROGRAM

OVERVIEW

Campus teams analyzed student data, surveys, and focus groups, to identify barriers to success that included unstructured pathways, too many academic choices, misaligned support, and unclear/inconsistent information. The results showed a need to redesign programs to help more students complete a degree or certificate and increase graduation rates. As a result, they created "Shark Path," a weave of strategies, programs, activities, and interventions that guide students from admissions to completing a credential and transition to the next stage—entry into a baccalaureate program or the labor market. The guided pathway integrates a three-tiered (pre-college, first year, and college mentoring) model of advising using a case management proactive approach. Pre-college advisors engage students early and encourage attendance while forming connections with MDC. Once enrolled, new students meet their assigned First Year Advisor, who provides career exploration and develops an Individualized Academic Plan using the Course Sequence Guides. Once 25% of students' classes are completed, they are assigned a college mentor, a faculty or department advisor, who provides guidance on internships, career options, and/or transfer to a four-year institution.

PROGRAM DESCRIPTION

The program has two goals: transformative change in the student experience to increase progression and completion and increased organizational capacity for innovation and improvement to sustain this change.

The Shark Path steps to success for students are:

- Completing admissions application and financial aid
- Attending mandatory orientation
- Completing a career assessment and declaring a program of study
- Completing English, math, and a first-year experience course during the first term
- Completing an Individualized Academic Plan during the first term
- Reaching milestones to stay on track to completion within less than three years.

Shark Path seeks to increase enrollment of new students each fall, successful completion of English and math courses, retention, and 150% completion rates.

OUTCOMES

Shark Path has seen an increase in math and English completion for all students. Of students entering the 2010 fall term, 30% passed math, and 46% passed English. In 2015, by the end of their first term, 94% of Hispanic students declared a program of study. Math pass rates have increased to 42%, and English Pass rates have increased by 62%. Average Hispanic Fall-to-Spring and Fall-to-Fall retention rates were 91% compared to 75% of Hispanic students not served by the program and 69% of white students not served by the program.

Hispanic enrollment increased from 6,181 (Fall 2012) to 7,227 (Fall 2015,) while 150% completion rates increased from 31% in 2012 to 36% in 2015.

UNION COUNTY COLLEGE | NEW JERSEY

LEARNING ENHANCED THROUGH ACCELERATED PATHS [LEAP]

OVERVIEW

LEAP (Learning Enhanced through Accelerated Paths) was established in fall 2012 to address a challenge faced by 75% of incoming Hispanic students at Union County College — the requirement of developmental courses that delay degree completion. LEAP encourages timely graduation by providing first-time students the opportunity to complete accelerated developmental courses in English, mathematics, or ESL. Students can complete remediation in fewer credit hours through the LEAP courses and begin college-level courses up to two semesters earlier than in traditional pathways. The course structure pairs classes for an integrated, engaging learning environment. LEAP designates academic advisors to provide intentional academic and career planning, tutors for in-class support, and coordinates a student leadership program to further support student success. The accelerated courses and student development program have resulted in substantial student success during the four years of LEAP, with over 400 students participating in courses and 200 in review sessions.

PROGRAM DESCRIPTION

The mission of LEAP is to improve the retention, academic success, and persistence of Hispanic and other low-income first-year students in developmental mathematics, developmental English, or ESL courses.

LEAP works toward the mission through three goals:

- Accelerated paths in developmental mathematics, developmental English, and ESL within a learning community model
- Executing an enhanced student development program, including in-class support tutoring, intrusive academic/career counseling, student orientation program, early warning alert, peer mentoring, and leadership development
- Implementing a cutting-edge professional development program for faculty and staff focused on innovative pedagogy, student retention, persistence, and data-based decision-making.

OUTCOMES

Students enrolled in LEAP courses reflected campus diversity and 41% of students were Hispanic/Latino. Students completed their developmental math, developmental English, or ESL coursework in less time than those in the traditional course pathway at Union County College. About 58% of students in LEAP development English courses completed remediation in one year compared to 33% of the baseline control group. About 60% of students in LEAP math courses completed development math in one year compared to 5.36% of baseline students. Overall, 75% of students in the LEAP ESL courses completed ESL within one year, compared to 20% of baseline students.

ADVISORY COMMITTEES

During the research of best practices, the use of HSI advisory committees was noted in multiple institutions. Most play an advisory role to the Chancellor at the district level or a president at the campus level and operate in harmony with other committees. Advisory Committees consider many areas of interest and make recommendations, including but not limited to, the following:

- Promote understanding that accepts, celebrates, and appreciates the Hispanic culture and history of the district or campus.
- Serve as a resource by providing information and educational forums that will facilitate better understanding and acceptance of cultural differences.
- Provide recommendations to the Chancellor, Cabinet, and the College President to identify opportunities to address Hispanic issues or promote programs of interest to the Hispanic community both internally and to the larger, outside community.
- Propose leadership initiatives that build institutional capacity and enhance diversity; recommend skill-building and organizational development opportunities for faculty, staff, and students.
- Work on processes that will enhance recruitment strategies to reach a broader and more ethnically diverse pool of candidates.
- Work with management staff to review processes and recommend changes that may positively impact broadening diversity and increasing educational or staff growth opportunities.
- Assist in the creation of a web-based clearinghouse to provide a single source of access to Hispanic-serving resources.
- Make recommendations for a communications strategy to keep equity and the campus's efforts towards equity prominent in faculty, staff, and students' minds.
- To recommend grant or partnership opportunities that would benefit students, faculty, and staff while enhancing the college.
- Explore innovative ways to promote a climate that is inviting for all and help all community members understand and learn from each other.
- Recommend ways to foster beneficial external relations and collaborations locally and statewide, and nationwide that enhance support for HSI programs.
- Recommend strategies to ensure that all staff in positions of authority understand and are sensitive to the Hispanic populations' issues on campus.

Other colleges have brown bag series regarding best practices to engage and support student success at minority-serving institutions or HSIs. These series are designed to provide opportunities for members of the college community to develop the knowledge, skills, and awareness related to cultural issues and work with diverse populations. Facilitators present information on best methods and practices for serving, engaging, and promoting student success.

Many colleges focus on the work of the Alliance of Hispanic Serving Institution Educators (AHSIE). This organization exists to support the work of the nation's Hispanic Serving Institutions as they seek to provide quality, relevant educational opportunities to large and growing numbers of underserved populations, particularly Hispanic students. Many of the Alliance's activities directly benefit practitioners and educators at HSIs through measures that involve cooperation, networking, partnerships, information-sharing, technical assistance, and collaboration.

Members of the Alliance share professional development opportunities, find technical assistance for the implementation of Title V funding and other capacity-building projects, and use an annual national conference as a forum to disseminate "best practices" for improving educational outcomes for students.

The Alliance also fosters cooperation and collaboration among member institutions to produce more competitive grant applications to federal agencies that provide funding for higher education. The Alliance will also act as a liaison between federal agencies and its member institutions.

CHAPTER 5 ECONOMIC TRENDS

FOCUS AREA:

Another key component in developing long-range planning for higher education institutions is the relationship between the national, state, and especially the local economy has on the operation of the college. By monitoring key metrics in the local economy, colleges can use these indicators to help predict potential disruptions that might affect their enrollment. Most who have been involved in higher education understand the counter-cyclical nature of higher education. During periods of economic slowdown, two things generally happen: (1) enrollment levels tend to rise faster than during times of economic growth, and (2) state revenues decline, putting pressure on states to reduce expenditures, including support for higher education. Historically, state and local support for higher education has "rebounded" once the economic growth resumes, but there is often a significant delay. While colleges cannot control or manipulate the local economy or its impact, by monitoring and adjusting college operations based upon economic metrics, the college can be better prepared when they do come along.

This chapter will provide data on key elements of the local economy in which the MCCCD operates. By understanding the local trends in the economy, the MCCCD can begin to predict and prepare for economic opportunities and disruptions that are a normal occurrence in modern economies. One of the most important aspects of monitoring economic activity at the local level is to ensure it is one on a regular basis. Data on specific economic trends important to the district should be regularly collected and analyzed.

As of this date, we are operating in a significant time of uncertainty because of the COVID-19 pandemic. What remains to be seen is will the collapse of the economy result in similar outcomes for higher education that we have seen in the past. Some economists predict that the pandemic drive large numbers of out-of-work residents to higher education institutions similar to what we have seen before, resulting in significant increases in enrollments. Other more conservative economists contend that this downturn in the economy will be different because of the personal safety fears many people have with larger gatherings of people. At the moment, it is still too soon to be able to form a solid prediction on how the general population will react to the COVID-19 pandemic. For this chapter, the data will be presented with the assumption that higher education will see a rise in enrollments because of the high unemployment levels.

QUESTIONS FOR THIS FOCUS AREA:

- Are there key economic metrics that can be used to inform academic planning so that programs lead to greater economic mobility for students?
- How can programs at your campus be better aligned with the workforce needs in Maricopa County?

TABLE 5.1 | MARICOPA COUNTY ECONOMIC POPULATION CHARACTERISTICS (2018)

Indicator	Maricopa Co.	Arizona	United States
Median Household Income	$65,252	$59,246	$61,937
Median Age	36.6	38	38.2
Individuals with a Disability	11.4%	13.3%	12.6%
Veterans	7.7%	9.0%	7.1%
Poverty Status	12.3%	14.0%	13.1%
Mean Travel Time to Work (minutes)	26.0	25.3	26.9
Civilian Labor Force Participation Rate	63.7%	59.2%	62.3%
Population (18 Years & Older)	76.1%	77.1%	77.6%
Households with Broadband Internet	84.1%	81.8%	88.3%

Source: U.S. Census Bureau: 2018 ACS 1-Year Estimates

ECONOMIC POPULATION CHARACTERISTICS

Some basic population characteristics are important to examine to give perspective to the unique and different characteristics of the region in which the MCCCD exists. Table 5.1 provides data on nine economic population characteristics in which the MCCCD should develop and maintain a good understanding.

The first indicator in the table is known as median household income and is a primary measure of a region's economic health. This indicator can be applied across various geographic areas to compare the standard of living. As noted in the table, Maricopa County has a fairly high median household income at $65,252. The Maricopa County median household income is 10% higher than the median in Arizona and 5.4% higher than the median household income across the United States. This indicates the current economy in Maricopa County is doing very well.

Maricopa County also has the lowest median age at 36.6 across the comparison groups in this study. Another key indicator is the poverty status. Maricopa County at 12.3% is slightly less than the overall poverty status across the U.S. Overall, the State of Arizona has the highest poverty rate at 14% among the comparison groups in the table.

LABOR FORCE PARTICIPATION RATE

Another key indicator is the labor force participation rate. The labor force participation rate refers to the number of people available for work as a percentage of the total population in a geographic area. The labor force participation rate is an important gauge of the health and potential output of the economy. As the economy expands, more individuals will be encouraged to enter the labor force – a measure including both employed persons and the unemployed who are actively seeking employment. The demographics of a region can affect this measure significantly. For example, a population with a higher percentage of adults in their prime working years will have a higher labor force participation rate and higher economic growth potential. Holding these demographic factors constant, a higher labor force participation rate indicates that workers believe businesses are hiring for jobs worth their time and effort – valuable information in assessing the labor market in a region.

The table presents rates for Maricopa County as well as for Arizona and the United States. The Maricopa County labor force participation rate is 63.7%, which is 4.5% higher than Arizona's overall rate. To put it into perspective, the highest recorded labor force participation rate in the United States was 67.3% in January of 2000. It has never reached that level since. The 2018 rate in the U.S. was 62.3%, and as of December 2018, the rate overall in Arizona was 59.2%. This is why the 63.7% rate that exists in Maricopa County is so important. For Maricopa County to maintain its robust labor force participation rate, it will be critical for MCCCD to constantly be adjusting its programmatic offerings to match the talent required by businesses in the service area.

UNEMPLOYMENT

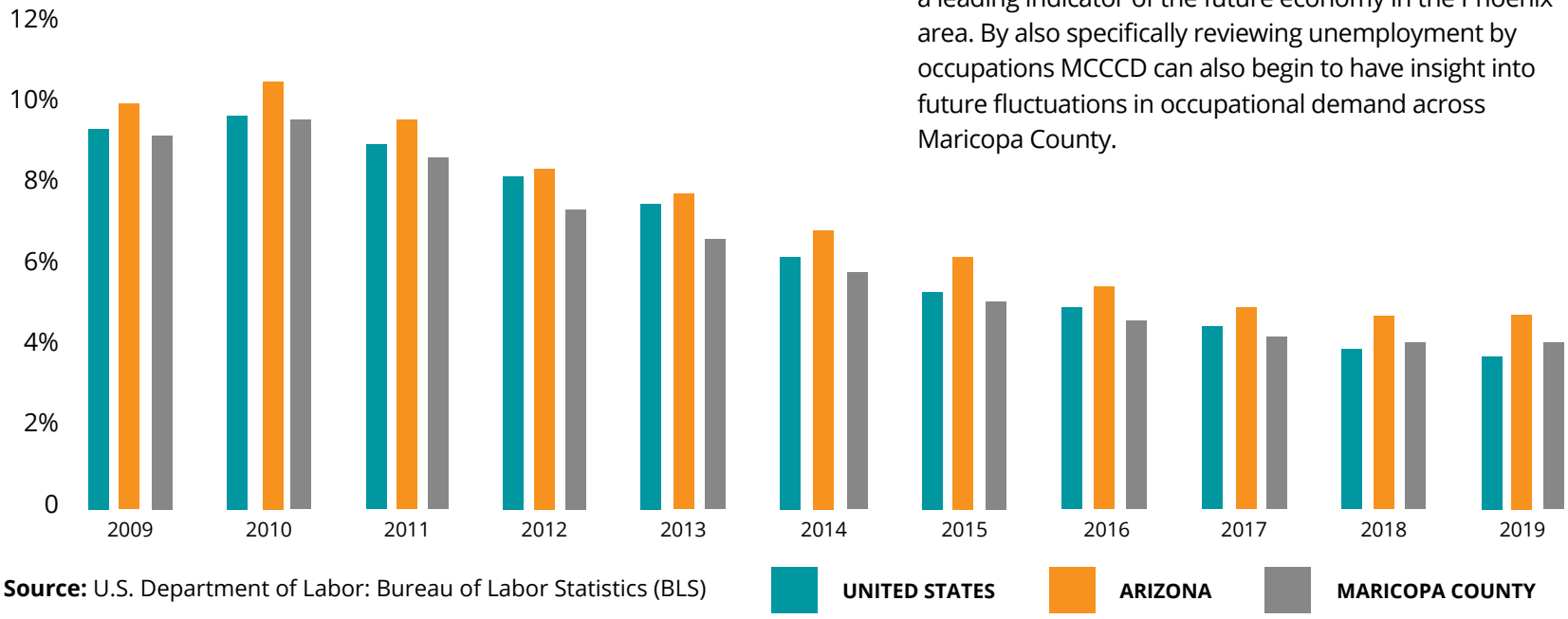
One of the easiest things to monitor at the local and regional level that provides real-time data regarding the economy's health is unemployment. Unemployment is defined by the Bureau of Labor Statistics (BLS) as people who do not have a job, have actively looked for work in the past four weeks, and are currently available for work. People who are temporarily laid off and waiting to be called back to that job are included in the unemployment statistics. The BLS measures unemployment through monthly household surveys called the Current Population Survey. It has been conducted every month since 1940, as part of the government's response to the Great Depression. Because the unemployment surveys are conducted monthly, they provide one of the most up-to-date data points to monitor the condition of the economy.

Unemployment data is usually available based upon a variety of geographic regions. For the purposes of this environmental scan we will present data for three geographic levels and also look at unemployment based upon occupational classifications. Figure 5.1 provides data that compares unemployment over a ten-year period for the United States, the State of Arizona and Maricopa County. As is noted in the graph, generally speaking Maricopa County and the State of Arizona unemployment rate closely track the overall unemployment rate across the U.S. One noticeable trend is that over the ten-year period the unemployment rate for Maricopa County was always lower than that of Arizona and the U.S. The other noticeable trend is that the Arizona unemployment rate has always been higher than the overall rate for the U.S.

Another component of unemployment data to monitor is unemployment by occupations. By monitoring occupational unemployment, a community college can potentially predict future program demand based upon increases or decreases in the unemployment of specific occupational areas. Figure 5.2 shows data for Occupations in Maricopa County. The data shows how there are sometimes large differences in unemployment rates across different occupations. Generally, these large differences in a regional area can be explained by several factors such as company closings, industry seasonal patterns or a deteriorating economy. By monitoring these fluctuations, MCCCD and each of the colleges can plan programmatically by developing strategies to alleviate and lessen their impacts over time.

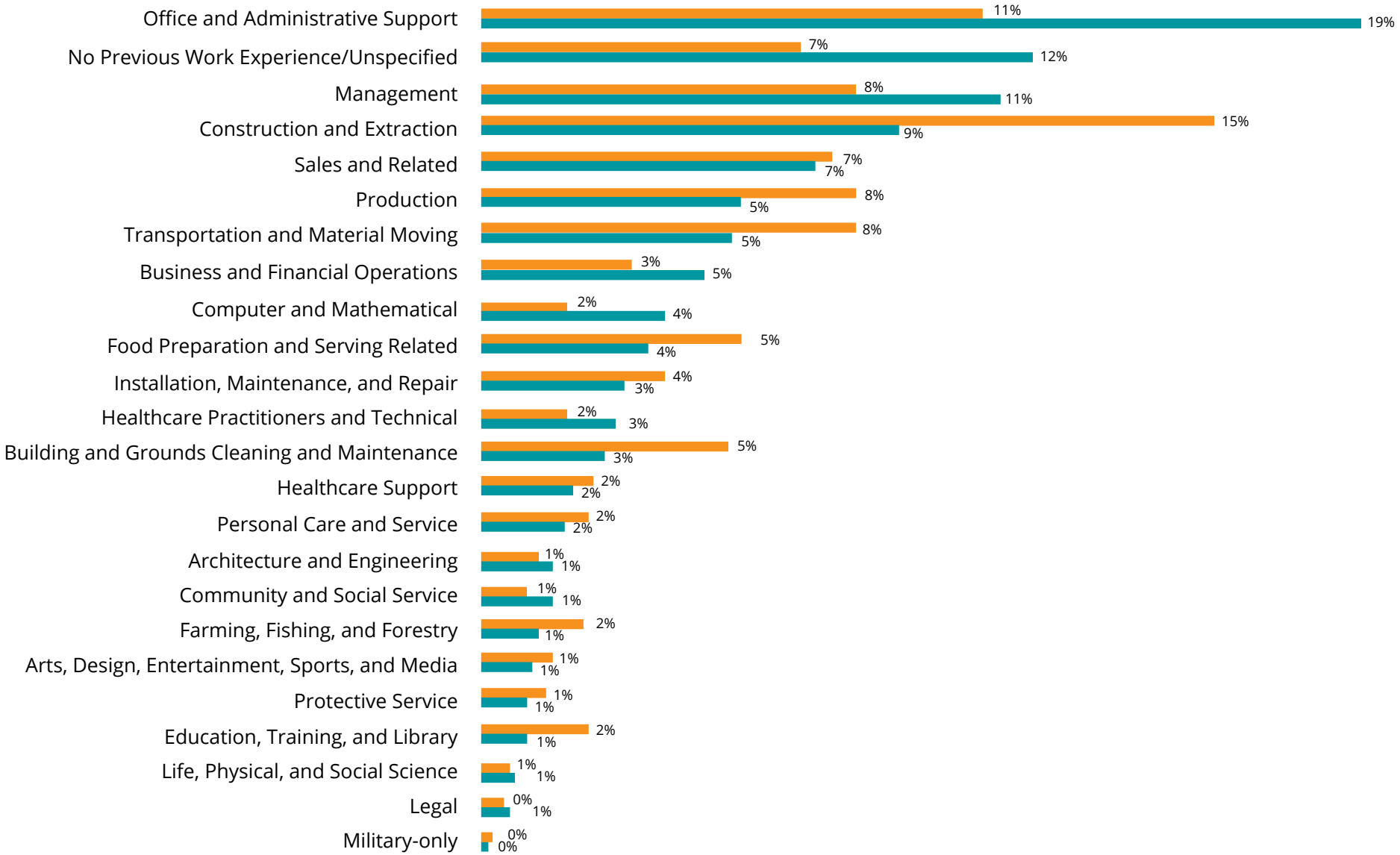
Frequent monitoring of the unemployment rate in Arizona and Maricopa County will provide MCCCD with a leading indicator of the future economy in the Phoenix area. By also specifically reviewing unemployment by occupations MCCCD can also begin to have insight into future fluctuations in occupational demand across Maricopa County.

FIGURE 5.1 | UNEMPLOYMENT RATES: 2009-2019



Source: U.S. Department of Labor: Bureau of Labor Statistics (BLS)

FIGURE 5.2 | UNEMPLOYMENT BY OCCUPATION: MARICOPA COUNTY (MARCH 2020)



Source: Emsi Q2 2020 Data Set

HOURS, EARNINGS AND WAGES

Another important gauge of economic health in a region is average weekly hours and earnings for employees. Table 5.2 summarizes data for the Maricopa County and the State of Arizona from 2017-2019. Three key metrics are measured regarding hours and wages. They are (1) average weekly hours, (2) average hourly earnings, and (3) average weekly earnings. As noted in the table, average weekly hours for each year in Maricopa County and Arizona are fairly consistent with the average weekly hours in Maricopa County slightly higher. In Maricopa County, over the three years of data shown in the table, average hourly earnings increased by $1.12 or approximately 4.2%. During the same time period, average weekly earnings increased by $45.32 or 4.8%. At the state level, average hourly earnings increased by $1.22 from 2017-2019, or approximately 4.8%. During the same time period, average weekly earnings increased by $39.93, or approximately 4.5%. Overall, this shows that the economy at both the state and Maricopa County levels is growing, as evidenced by increasing weekly hours and increased earnings at the hourly and weekly levels.

TABLE 5.2 | AVERAGE WEEKLY HOURS & EARNINGS: 2017-2019

	2019		2018		2017	
	Phoenix MSA	Arizona	Phoenix MSA	Arizona	Phoenix MSA	Arizona
Average Weekly Hours for All Employees	35.7	34.8	35.7	35	35.5	34.9
Average Hourly Earnings for All Employees	$27.81	$26.43	$27.04	$25.57	$26.69	$25.21
Average Weekly Earnings for All Employees	$992.82	$919.76	$965.33	$894.95	$947.50	$879.83

Source: Arizona Office of Economic Opportunity

PER CAPITA PERSONAL INCOME

The data shown in Table 5.3 compares per capita personal income from 2016-2018 for the United States, Arizona, and Maricopa County. During the three years, per capita personal income in Maricopa County has increased by $3,869, or approximately 8.8%. During the same time period, the per capita personal income across the United States increased by $4,576 or about 9.2%, and in Arizona, per capita, personal income has increased by $3,658 or 9%.

TABLE 5.3 | PER CAPITA PERSONAL INCOME: 2016 - 2018

	2016	2017	2018
United States	$49,870	$51,855	$54,446
Arizona	$40,671	$42,505	$44,329
Maricopa County	$43,825	$45,667	$47,694

Source: Arizona Office of Economic Opportunity

FUTURE OCCUPATIONAL DEMAND

Given the climate today—economically, politically, and educationally—the interest in how colleges are meeting the workforce's needs has never been greater. The ability and relevancy of higher education to prepare the future workforce is being examined by legislators, business and industry, employers, funders, and the general public. Meeting the needs of the workforce is historically the primary realm and responsibility of community colleges. It is clear that the role that community colleges play in the higher education hierarchy is to prepare students for the next level of education, and link students to viable careers in the workforce, while reaching out to business and industry to help them fill the needs of their talent pipeline.

The COVID-19 pandemic has resulted in a major decline in jobs over the last several months. It is too early yet to fully understand just exactly how long the pandemic will impact occupational demand. The only real-time measure that is currently available is the overall unemployment rate. Most other workforce measures have anywhere from a 3-12 month lag between when the data is collected and when it is released. Until a broader range of workforce and employment data is available, it will be difficult to predict occupational demand with any degree of accuracy. That being the case, for this analysis, we will use currently available data until we begin to receive and analyze data from the time period of the pandemic. For the time being, academic planners would be best to focus on future projections because the projections will average the highs and lows over time to give a more accurate picture of what kinds of occupations will be in demand.

To adequately plan for the future workforce development needs in Maricopa County, it is important to constantly monitor the changes in occupational demands and future business and industry needs. Over the next several pages, data is presented in three different formats that examine the current occupational needs compared to the projected occupational needs ten years into the future.

TABLE 5.4 | LARGEST OCCUPATIONS IN MARICOPA COUNTY: 2020-2030

Occupation	2020 Jobs	2030 Jobs	Change in Jobs (2020-2030)	% Change	2018 Median Hourly Earnings
Office and Administrative Support	373,491	407,347	33,856	9%	$17.22
Food Preparation and Serving Related	190,772	224,369	33,597	18%	$11.54
Management	148,089	169,289	21,200	14%	$43.18
Transportation and Material Moving	147,762	168,962	21,200	14%	$15.85
Business and Financial Operations	137,097	158,382	21,285	16%	$29.73
Healthcare Practitioners and Technical	124,988	153,488	28,500	23%	$34.92
Personal Care and Service	107,401	132,535	25,134	23%	$11.64
Education, Training, and Library	98,570	113,644	15,074	15%	$19.97
Production	92,205	94,880	2,675	3%	$16.27
Installation, Maintenance, and Repair	89,742	101,300	11,558	13%	$20.87

Source: Emsi Q2 2020 Data Set

This data has been sorted to reflect occupations that require postsecondary training of either some college/ no degree, a postsecondary non-degree award, or an associate's degree.

The next section of this report will present data based on occupational classifications. The Standard Occupational Classification (SOC) System is a United States government system of classifying occupations. It is used by U.S. federal government agencies to collect occupational data, enabling comparison of occupations across data sets. It is designed to cover all occupations in which work is performed for pay or profit, reflecting the current occupational structure in the United States. The most recent SOC includes 840 occupational types.

Table 5.4 shows the ten largest occupations in 2020 compared to 2030. Office and administrative support occupations are projected to be the largest share of occupations by 2030, with nearly half a million jobs in Maricopa County. This occupational area is projected to grow by over 9% over the next ten years. While this is not close to being one of the fastest-growing occupational areas, its sheer numbers make it an important occupational area for MCCCD to monitor.

The next largest occupational area is jobs in food preparation and serving, which will consist of 224,369 jobs in Maricopa County by 2030. This occupational area is the third fastest-growing occupational area in the county. The only caution regarding this occupational area is that it has the lowest median hourly earnings among the top ten occupations. While there are a significant number of jobs in this occupational area, the college will have to look strategically at perhaps some of the support occupations that have above average wages to justify a significant investment into providing programs.

The third-largest occupational area is jobs in management occupations. These jobs are projected to grow by over 14% to 169,289 jobs over the next ten years and will have the highest median hourly earnings of the top ten occupations.

The top three occupational areas comprise more than half of the total job growth over the next ten years. MCCCD will want to monitor on an annual basis any changes in the increase or decrease of these ten largest occupational areas so that their primary programs closely match the demand that exists in the workplace.

Table 5.5 provides data on the ten highest-paying occupations in Maricopa County in 2020 compared to 2030. As noted in the previous section, management occupations requiring more than a high school diploma and less than a four-year degree have the highest median earnings of the top ten at $43.18 per hour. Computer and mathematical occupations are the second highest paying category in 2020, with median earnings of $38.09 per hour. This category is significant because it shows growth from 2020 to 2030 of 18%. Architecture and engineering occupations are the third highest-paying occupations at $37.12 per hour. The healthcare practitioner's occupational area has a median pay of $34.92 and will have total job growth of 23% from 2020 to 2030. It will be critically important for MCCCD to be constantly aware of the occupations with the highest earnings. Generally, potential students are interested in getting the greatest return on their investment in education. They will be seeking to enter training programs that offer them the potential to get higher-paying jobs. Having this information readily available can assist in marketing and recruiting efforts the college develops annually.

TABLE 5.5 | HIGHEST PAYING OCCUPATIONS IN MARICOPA COUNTY: 2020-2030

Occupation	2020 Jobs	2030 Jobs	Change in Jobs (2020-2030)	% Change	2018 Median Hourly Earnings
Management	148,089	169,289	21,200	14%	$43.18
Computer and Mathematical	82,544	97,626	15,082	18%	$38.09
Architecture and Engineering	40,880	43,298	2,418	6%	$37.12
Legal	17,795	19,977	2,182	12%	$34.93
Healthcare Practitioners and Technical	124,988	153,488	28,500	23%	$34.92
Business and Financial Operations	137,097	158,382	21,285	16%	$29.73
Life, Physical, and Social Science	13,154	15,307	2,153	16%	$28.50
Installation, Maintenance, and Repair	89,742	101,300	11,558	13%	$20.87
Arts, Design, Entertainment, Sports, and Media	38,356	43,113	4,757	12%	$20.41
Community and Social Service	33,907	41,830	7,923	23%	$20.40

Source: Emsi Q2 2020 Data Set

TABLE 5.6 | FASTEST GROWING OCCUPATIONS IN MARICOPA COUNTY: 2020-2030

Occupation	2020 Jobs	2030 Jobs	Change in Jobs (2020-2030)	% Change	2018 Median Hourly Earnings
Office and Administrative Support	373,491	407,347	33,856	9%	$17.22
Food Preparation and Serving Related	190,772	224,369	33,597	18%	$11.54
Healthcare Practitioners and Technical	124,988	153,488	28,500	23%	$34.92
Personal Care and Service	107,401	132,535	25,134	23%	$11.64
Business and Financial Operations	137,097	158,382	21,285	16%	$29.73
Management	148,089	169,289	21,200	14%	$43.18
Transportation and Material Moving	147,762	168,962	21,200	14%	$15.85
Healthcare Support	59,452	76,865	17,413	29%	$14.83
Computer and Mathematical	82,544	97,626	15,082	18%	$38.09
Education, Training, and Library	98,570	113,644	15,074	15%	$19.97

Source: Emsi Q2 2020 Data Set

The final occupational area MCCCD should consistently monitor is information that shows the fastest-growing occupations in Maricopa County. Table 5.6 provides data on the ten fastest-growing occupational areas in Maricopa County between 2020 and 2030. Projections indicate that the fastest growing occupational area of the ten years of 2020-2030 will be office and administrative support, which will grow by 33,856 jobs, which equates to a 9% increase. The second fastest-growing occupational area will be food preparation, which will grow by 33,597 jobs or a growth rate of 18%. The next fastest-growing occupational area will be healthcare practitioners. While there will be an increase of 28,500 jobs in this occupational area, it should be noted that the median earnings will be $34.92 per hour, the third-highest median earning in the top ten. MCCCD should consistently monitor the fastest-growing occupations so that programs can be added as needed to help ease shortage concerns for local businesses and employers.

NAICS INDUSTRY SECTOR INFORMATION

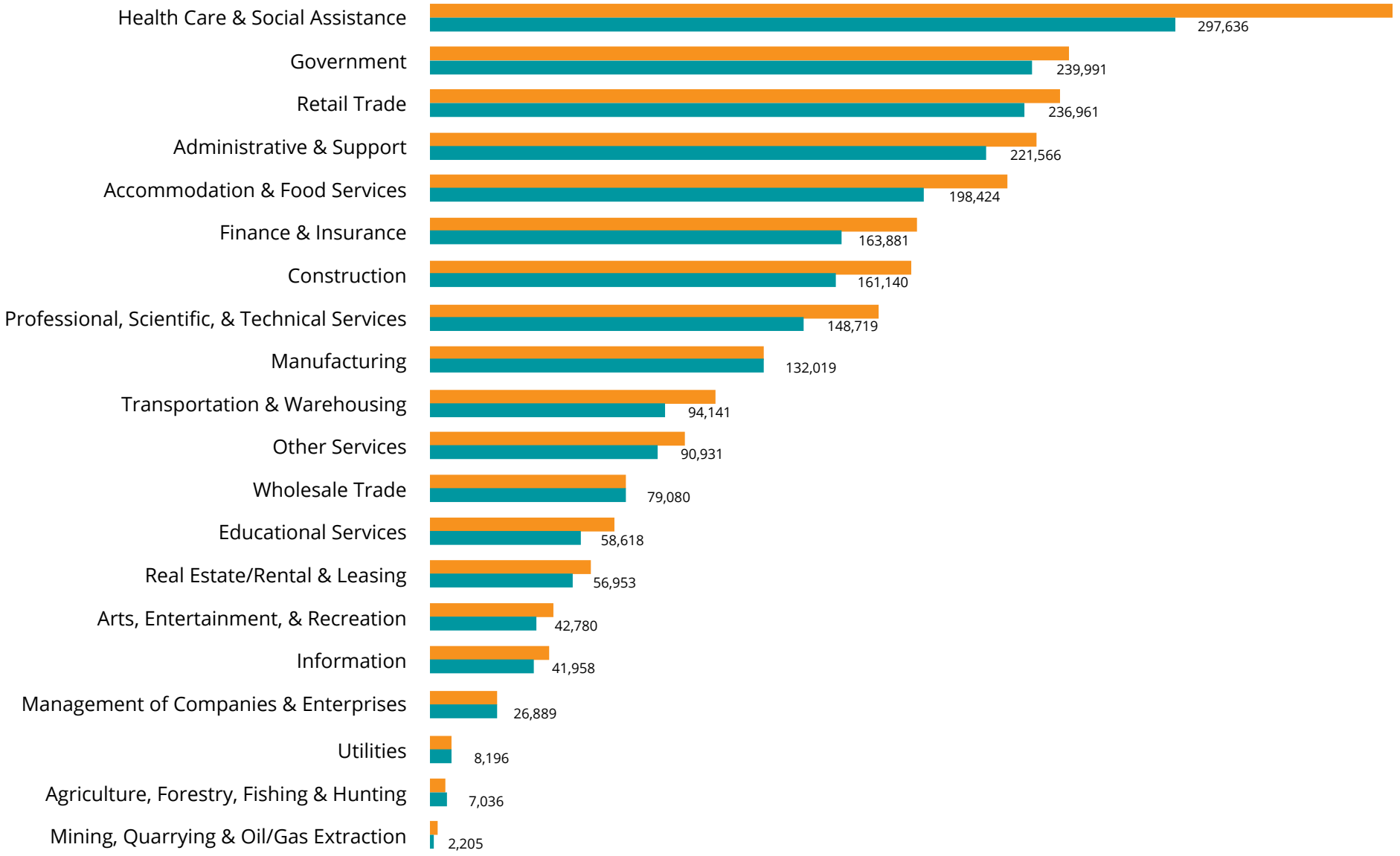
In this section of the report, we will examine data based upon industry classifications instead of occupational classifications, which was discussed in the previous section. Two standard classifications are used throughout the federal government to classify both industries and occupations. They consist of the North American Industry Classification System (NAICS) and the Standard Occupational Classification (SOC). The NAICS was developed by the United States, Canada, and Mexico to provide comparable industry statistics across the three countries. It is a comprehensive system covering the entire field of economic activities. The NAICS code describes industries and does not describe occupations held by people within that industry.

As discussed in the previous section, the SOC is the federal government's regularly-updated system for classifying occupations, which are grouped according to the nature of the work performed. The SOC code describes occupations held by individuals and does not describe the industries in which people work.

Figure 5.3 provides data on NAICS job categories for Maricopa County. In 2020, there are a total of 2,310,123 jobs in Maricopa County. As noted in the chart, healthcare and social assistance, government, and retail trade comprise the top three industry categories consisting of a total of 774,587 jobs, which makes up 33.5% of all jobs. Projections indicate that by 2030 total NAICS jobs in Maricopa County will increase to 2,632,461, a 14% increase over the ten years. In 2030, the top three NAICS industry sector jobs remain the same with healthcare and social assistance, government and retail trade consisting of 889,297 jobs comprising 33.8% of all jobs in Maricopa County. Projections indicate that accommodation and food service jobs will increase by 29% over the ten years, and finance and insurance jobs will grow by 23%, and educational service jobs will increase by 21%. Only two NAICS industry job sectors are projected to decline. Mining, quarrying, and oil/gas extraction jobs are projected to decrease by 8%, and arts, entertainment, and recreation jobs are expected to decline by 2%.

It will be helpful for MCCCD and individual colleges to monitor on an annual basis the changes in NAICS industry sector jobs. While it is important to understand occupational data, it is often difficult to predict precisely at an occupational level, exactly what programs need to be in place to meet workforce demand. By monitoring industry sector jobs, initial decisions can be made based upon projections to support and grow key educational programs that provide talent for industry sectors that provide multiple opportunities for graduates from programs with a diversity of occupational outcomes.

FIGURE 5.3 | INDUSTRY SECTOR JOBS IN MARICOPA COUNTY: 2020-2030



Source: Emsi Q2 2020 Data Set

CHAPTER 6 WORKFORCE TRENDS

FOCUS AREA:

An efficient labor market requires a seamless flow of skilled workers from the educational institutions that educate and train them to the employers that hire them. It would seem that keeping an equilibrium between what employers need for workforce talent and what the workforce system produces should be easily maintained. However, it is not uncommon for workforce development systems to become misaligned with employer needs resulting in a surplus of workers in some occupational areas and shortages of workers in other occupational areas. One factor behind workforce misalignment stems from when employers' needs evolve differently from the educational programs that train their workers. These misalignments may happen at different times and for different reasons: (1) employer training becomes more tailored and comprehensive; (2) businesses come and go, and certain educational programs become more or less pertinent to a specific region; (3) rapid advances in technology and business create curriculum needs that few educational institutions possess; and (4) as economic conditions shift, businesses have different hiring requirements of their employees. In light of these dynamics, an up-to-date understanding of the regional economy and the demand for skilled labor is vital to the planning efforts of colleges seeking to adapt their program offerings to the requirements of an ever-changing workforce.

To gain better insight into economic conditions and workforce trends in Maricopa County, the information and data shared in this chapter will provide each college a way to examine occupational demand in relation to its current program offerings and program completions. The goal of the analysis is to provide MCCCD and each college with relevant data and information that it can use when making decisions about current and future program development and how that needs to be reflected in the facility master planning process.

QUESTIONS FOR THIS FOCUS AREA:

- Does the need exist to implement new program/s to address current occupational demand?
- Are there programs that should be consolidated with other campuses because of the reduced need for graduates?
- Based on the change in demand for occupations from 2020 to 2030, how will programs need to be realigned to ensure program graduates meet workforce needs?

IMPACT OF COVID-19

MCCCD initiated the facility master planning process in early February of 2020. Less than 30 days later, the economic landscape across the country had been changed dramatically due to furloughs and layoffs by employers because of stay-at-home orders from states. There is no shortage of opinions and projections of the short-term and long-term effects this will have on the economy and the workforce. We believe that it is too early in this process to predict with any accuracy specific campus-level solutions and strategies that should be implemented to address these challenges. As a part of the master planning process, we had planned to conduct a Program Demand Gap Analysis (PDGA) at the district-level to develop information to start the planning process. The PDGA is used to better understand how to align campus-level program offerings in relation to workforce needs. Because of the uncertainty of the COVID-19 impact and a current lack of data on the workforce impact over the coming months, we are delaying the development of the PDGA until later in the summer or early fall.

However, in the interim, it will be important for the planning process to continue with at least some occupational data that the colleges can use during the initial phases of the facility master planning process. To accommodate this data analysis, we have developed an occupational table for each college to inform this discussion based on data currently available. There is also an economic overview report that provides a comprehensive set of economic data on key metrics for Maricopa County. Links are provided on this website for the economic overview and your College-specific occupational table.

CAMPUS-LEVEL OCCUPATIONAL TABLE

To assist in understanding the data contained in the occupational table (see Table 6.1), below is a description of what is included in each column of data:

SOC: The standard occupational classification identifier for each occupation in Maricopa County when this report was developed.

Description: A description of the SOC for each occupation in Maricopa County when this report was developed.

2020 Jobs: The total number of jobs reported for this occupational area for 2020 within Maricopa County.

2030 Jobs: The total number of jobs projected to exist for this occupational area by 2030 within Maricopa County.

2020-2030 Change: The increase or decrease in the total number of jobs for this SOC between 2020 and 2030.

2020-2030% Change: The percent of change in the total number of jobs for this SOC between 2020 and 2030.

Annual Openings: The total number of projected annual openings for each SOC in Maricopa County between 2020-2030. Annual openings will consist of both the creation of new jobs and the number of replacement jobs due to employment changes by workers.

Median Annual Earnings: The median annual earnings for each SOC, based upon data collected on jobs in Maricopa County.

Typical Entry-Level Education: This represents the typical entry-level education that is required for this occupational area. For this chart, the data has been filtered to only include occupations that require either a certificate or an associate's degree.

Institutional Completions (2018): This data consists of the number of completions for this occupation for the listed college based upon data the institution reported to the National Center for Educational Statics (NCES) through the Integrated Postsecondary Education Data System (IPEDS).

Regional Completions (2018): This data represents the total number of completions for all institutions offering programs for this occupational area within Maricopa County as reported to IPEDS.

TABLE 6.1 | ALL OCCUPATIONS IN MARICOPA COUNTY REQUIRING A CERTIFICATE OR ASSOCIATE'S DEGREE | CHANDLER-GILBERT

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Chandler-Gilbert Community College Completions (2018)	Regional Completions (2018)
11-9061	Funeral Service Managers	89	100	11	12%	8	$75,209.76	Associate's	31	33
13-1032	Insurance Appraisers, Auto Damage	818	895	77	9%	81	$58,653.08	Certificate	0	31
15-1134	Web Developers	2,824	3,383	559	20%	293	$60,171.49	Associate's	54	5,664
15-1152	Computer Network Support Specialists	5,097	5,704	607	12%	505	$53,893.44	Associate's	30	3,095
17-3011	Architectural and Civil Drafters	1,715	1,825	110	6%	194	$59,439.82	Associate's	0	94
17-3012	Electrical and Electronics Drafters	606	654	48	8%	70	$63,596.43	Associate's	0	44

Source: Emsi Q2 2020 Data Set May 2020

READING THE OCCUPATIONAL TABLE

The occupational table information can be useful as each campus assesses how well their instructional programs are aligned with the talent needs of business and industry. As you examine the table, over time, as the general population increases, most occupational areas will typically see some natural increase in demand. The best gauge to ensure workforce alignment with programs is to compare annual openings for each occupational area with both the institutional output and the regional output. In some instances where programs may have online enrollments, the completions may be significantly greater than the annual openings. Because many online programs have enrollments from possibly other states or even other countries, it may be difficult to determine specific local output unless data can be obtained to see where program completers physically reside. This single table should not be the only data used to make program decisions. This data can provide a starting point for academic planning. Still, they should be supplemented with additional local data and input from business and industry through program advisory committees.

NEXT STEPS:

As soon as the district-level PDGA has been completed later this summer, a notification will be sent to your master planning committee. A link to the full report for the PDGA will be placed on this website so that your master planning committee can retrieve it for further analysis.

TABLE 6.2 | ALL OCCUPATIONS IN MARICOPA COUNTY REQUIRING A CERTIFICATE OR ASSOCIATE'S DEGREE | CHANDLER-GILBERT

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Chandler-Gilbert Community College Completions (2018)	Regional Completions (2018)
11-9061	Funeral Service Managers	89	100	11	12%	8	$75,209.76	Associate's	31	33
13-1032	Insurance Appraisers, Auto Damage	818	895	77	9%	81	$58,653.08	Certificate	0	31
15-1134	Web Developers	2,824	3,383	559	20%	293	$60,171.49	Associate's	54	5,664
15-1152	Computer Network Support Specialists	5,097	5,704	607	12%	505	$53,893.44	Associate's	30	3,095
17-3011	Architectural and Civil Drafters	1,715	1,825	110	6%	194	$59,439.82	Associate's	0	94
17-3012	Electrical and Electronics Drafters	606	654	48	8%	70	$63,596.43	Associate's	0	44
17-3013	Mechanical Drafters	851	857	6	1%	90	$60,160.96	Associate's	0	45
17-3019	Drafters, All Other	295	315	20	7%	34	$52,568.51	Associate's	0	46
17-3021	Aerospace Engineering and Operations Technicians	738	768	30	4%	76	$66,250.81	Associate's	0	0
17-3022	Civil Engineering Technicians	791	871	80	10%	89	$56,470.51	Associate's	0	0
17-3023	Electrical and Electronics Engineering Technicians	2,414	2,385	(29)	(1%)	235	$62,989.50	Associate's	21	127
17-3024	Electro-Mechanical Technicians	322	324	2	1%	32	$50,282.83	Associate's	0	352
17-3025	Environmental Engineering Technicians	218	250	32	15%	26	$46,265.59	Associate's	0	0
17-3026	Industrial Engineering Technicians	2,129	2,101	(28)	(1%)	209	$58,049.39	Associate's	0	80
17-3027	Mechanical Engineering Technicians	700	718	18	3%	71	$57,813.10	Associate's	0	3
17-3029	Engineering Technicians, Except Drafters, All Other	1,674	1,731	57	3%	172	$55,855.50	Associate's	0	197
19-4011	Agricultural and Food Science Technicians	243	270	27	11%	34	$35,757.38	Associate's	0	0

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Chandler-Gilbert Community College Completions (2018)	Regional Completions (2018)
19-4031	Chemical Technicians	605	681	76	13%	72	$42,147.65	Associate's	0	0
19-4041	Geological and Petroleum Technicians	274	295	21	8%	31	$47,725.52	Associate's	0	0
19-4051	Nuclear Technicians	34	35	1	3%	4	$117,827.24	Associate's	0	1
19-4091	Environmental Science and Protection Technicians, Including Health	507	572	65	13%	71	$40,235.14	Associate's	3	510
19-4093	Forest and Conservation Technicians	120	134	14	12%	17	$37,936.78	Associate's	0	3
19-4099	Life, Physical, and Social Science Technicians, All Other	829	942	113	14%	117	$45,164.84	Associate's	0	105
23-2011	Paralegals and Legal Assistants	6,017	6,988	971	16%	786	$48,199.56	Associate's	0	500
23-2091	Court Reporters	112	136	24	21%	14	$58,138.81	Certificate	0	206
23-2099	Legal Support Workers, All Other	553	602	49	9%	56	$54,297.60	Associate's	0	294
25-2011	Preschool Teachers, Except Special Education	5,502	6,424	922	17%	690	$27,458.03	Associate's	7	1,311
25-4031	Library Technicians	975	1,026	51	5%	159	$30,741.64	Certificate	0	0
27-4011	Audio and Video Equipment Technicians	1,505	1,732	227	15%	196	$42,254.96	Certificate	0	435
27-4012	Broadcast Technicians	339	361	22	6%	40	$29,657.52	Associate's	0	4
27-4014	Sound Engineering Technicians	141	162	21	15%	18	$40,125.52	Certificate	0	434
29-1124	Radiation Therapists	262	317	55	21%	19	$85,027.87	Associate's	0	0
29-1126	Respiratory Therapists	1,938	2,460	522	27%	169	$58,955.14	Associate's	0	81
29-2021	Dental Hygienists	2,481	3,113	632	25%	251	$91,543.97	Associate's	0	114
29-2031	Cardiovascular Technologists and Technicians	670	820	150	22%	56	$49,058.77	Associate's	0	25
29-2032	Diagnostic Medical Sonographers	1,629	2,063	434	27%	145	$88,655.29	Associate's	0	32

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Chandler-Gilbert Community College Completions (2018)	Regional Completions (2018)
29-2033	Nuclear Medicine Technologists	224	277	53	24%	19	$86,266.24	Associate's	0	15
29-2034	Radiologic Technologists	2,675	3,331	656	25%	231	$66,838.84	Associate's	0	95
29-2035	Magnetic Resonance Imaging Technologists	664	834	170	26%	58	$84,534.95	Associate's	0	95
29-2041	Emergency Medical Technicians and Paramedics	2,157	2,445	288	13%	181	$36,779.19	Certificate	48	969
29-2051	Dietetic Technicians	1,151	1,290	139	12%	113	$28,180.74	Associate's	10	306
29-2053	Psychiatric Technicians	2,158	2,499	341	16%	223	$34,523.20	Certificate	0	13
29-2054	Respiratory Therapy Technicians	285	176	(109)	(38%)	19	$60,279.40	Associate's	0	105
29-2055	Surgical Technologists	1,819	2,191	372	20%	200	$52,190.36	Certificate	0	121
29-2056	Veterinary Technologists and Technicians	1,087	1,487	400	37%	145	$34,963.93	Associate's	0	427
29-2057	Ophthalmic Medical Technicians	247	393	146	59%	41	$38,228.25	Certificate	0	18
29-2061	Licensed Practical and Licensed Vocational Nurses	5,513	7,434	1,921	35%	683	$55,934.87	Certificate	1	196
29-2071	Medical Records and Health Information Technicians	4,843	5,744	901	19%	430	$37,482.12	Certificate	0	1,412
29-2099	Health Technologists and Technicians, All Other	2,268	2,924	656	29%	242	$43,927.39	Certificate	0	44
29-9099	Healthcare Practitioners and Technical Workers, All Other	531	648	117	22%	45	$37,976.81	Certificate	0	1
31-1014	Nursing Assistants	10,671	13,906	3,235	30%	1,699	$31,184.15	Certificate	0	542
31-2011	Occupational Therapy Assistants	989	1,281	292	30%	152	$63,688.29	Associate's	0	25
31-2021	Physical Therapist Assistants	1,866	2,337	471	25%	308	$48,250.40	Associate's	0	99
31-9011	Massage Therapists	3,389	4,164	775	23%	516	$36,984.80	Certificate	14	441
31-9091	Dental Assistants	5,163	6,290	1,127	22%	755	$44,093.54	Certificate	0	415
31-9092	Medical Assistants	14,217	18,433	4,216	30%	2,216	$33,777.64	Certificate	0	2,497
31-9094	Medical Transcriptionists	527	684	157	30%	100	$33,876.24	Certificate	0	0

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Chandler-Gilbert Community College Completions (2018)	Regional Completions (2018)
31-9097	Phlebotomists	1,043	1,834	791	76%	230	$31,255.56	Certificate	0	357
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	1,110	1,225	115	10%	85	$79,055.37	Certificate	0	1
33-2011	Firefighters	3,060	3,460	400	13%	262	$53,773.86	Certificate	1	195
33-2021	Fire Inspectors and Investigators	136	154	18	13%	15	$71,940.24	Certificate	1	195
35-2013	Cooks, Private Household	17	20	3	18%	3	$39,410.53	Certificate	0	176
39-4011	Embalmers	62	67	5	8%	11	$48,084.35	Associate's	31	33
39-4031	Morticians, Undertakers, and Funeral Directors	115	138	23	20%	18	$38,599.79	Associate's	31	33
39-5011	Barbers	1,064	1,369	305	29%	166	$18,066.86	Certificate	0	41
39-5012	Hairdressers, Hairstylists, and Cosmetologists	12,119	14,009	1,890	16%	1,826	$24,638.36	Certificate	0	772
39-5091	Makeup Artists, Theatrical and Performance	15	23	8	53%	3	$56,132.98	Certificate	0	760
39-5092	Manicurists and Pedicurists	2,273	2,786	513	23%	340	$23,721.47	Certificate	0	778
39-5094	Skincare Specialists	1,791	2,061	270	15%	247	$31,145.56	Certificate	0	1,465
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	1,820	1,914	94	5%	221	$40,788.14	Associate's	0	15
43-9031	Desktop Publishers	129	121	(8)	(6%)	15	$33,926.43	Associate's	0	15
49-2021	Radio, Cellular, and Tower Equipment Installers and Repairs	428	453	25	6%	51	$49,612.86	Associate's	0	0
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	2,569	2,988	419	16%	348	$59,770.10	Certificate	0	0
49-2091	Avionics Technicians	332	362	30	9%	28	$65,981.14	Associate's	71	71

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Chandler-Gilbert Community College Completions (2018)	Regional Completions (2018)
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	62	73	11	18%	7	$48,903.17	Certificate	0	1,260
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	596	648	52	9%	60	$63,264.27	Certificate	8	20
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	405	449	44	11%	42	$86,603.04	Certificate	0	107
49-2097	Electronic Home Entertainment Equipment Installers and Repairers	1,533	1,380	(153)	(10%)	160	$45,616.33	Certificate	0	0
49-3011	Aircraft Mechanics and Service Technicians	4,314	4,556	242	6%	391	$64,352.24	Certificate	133	133
49-3023	Automotive Service Technicians and Mechanics	11,618	12,952	1,334	11%	1,329	$39,494.98	Certificate	0	1,260
49-3052	Motorcycle Mechanics	35	41	6	17%	5	$23,268.48	Certificate	0	566
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	7,525	9,357	1,832	24%	1,014	$43,236.94	Certificate	0	304
49-9062	Medical Equipment Repairers	719	758	39	5%	82	$40,311.56	Associate's	0	6
49-9081	Wind Turbine Service Technicians	76	119	43	57%	15	$49,529.34	Certificate	0	97
49-9092	Commercial Divers	22	27	5	23%	3	$48,907.34	Certificate	0	0
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	217	275	58	27%	31	$56,154.10	Certificate	0	487
51-4111	Tool and Die Makers	494	503	9	2%	51	$52,220.68	Certificate	0	0
51-5111	Prepress Technicians and Workers	171	166	(5)	(3%)	21	$42,810.00	Certificate	0	145

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Chandler-Gilbert Community College Completions (2018)	Regional Completions (2018)
53-2021	Air Traffic Controllers	432	462	30	7%	45	$102,672.99	Associate's	0	12
53-3032	Heavy and Tractor-Trailer Truck Drivers	21,973	24,814	2,841	13%	2,967	$43,022.27	Certificate	0	789
53-5021	Captains, Mates, and Pilots of Water Vessels	483	506	23	5%	49	$76,183.09	Certificate	0	0
53-5022	Motorboat Operators	43	47	4	9%	5	$45,574.76	Certificate	0	0
53-5031	Ship Engineers	49	54	5	10%	7	$65,537.69	Certificate	0	0

Source: Emsi Q2 2020 Data Set May 2020

TABLE 6.3 | ALL OCCUPATIONS IN MARICOPA COUNTY REQUIRING A CERTIFICATE OR ASSOCIATE'S DEGREE | ESTRELLA MOUNTAIN

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Estrella Mountain Community College Completions (2018)	Regional Completions (2018)
11-9061	Funeral Service Managers	89	100	11	12%	8	$75,209.76	Associate's	0	33
13-1032	Insurance Appraisers, Auto Damage	818	895	77	9%	81	$58,653.08	Certificate	0	31
15-1134	Web Developers	2,824	3,383	559	20%	293	$60,171.49	Associate's	155	5,664
15-1152	Computer Network Support Specialists	5,097	5,704	607	12%	505	$53,893.44	Associate's	128	3,095
17-3011	Architectural and Civil Drafters	1,715	1,825	110	6%	194	$59,439.82	Associate's	0	94
17-3012	Electrical and Electronics Drafters	606	654	48	8%	70	$63,596.43	Associate's	0	44
17-3013	Mechanical Drafters	851	857	6	1%	90	$60,160.96	Associate's	0	45
17-3019	Drafters, All Other	295	315	20	7%	34	$52,568.51	Associate's	0	46
17-3021	Aerospace Engineering and Operations Technicians	738	768	30	4%	76	$66,250.81	Associate's	0	0
17-3022	Civil Engineering Technicians	791	871	80	10%	89	$56,470.51	Associate's	0	0
17-3023	Electrical and Electronics Engineering Technicians	2,414	2,385	(29)	(1%)	235	$62,989.50	Associate's	11	127
17-3024	Electro-Mechanical Technicians	322	324	2	1%	32	$50,282.83	Associate's	1	352
17-3025	Environmental Engineering Technicians	218	250	32	15%	26	$46,265.59	Associate's	0	0
17-3026	Industrial Engineering Technicians	2,129	2,101	(28)	(1%)	209	$58,049.39	Associate's	10	80
17-3027	Mechanical Engineering Technicians	700	718	18	3%	71	$57,813.10	Associate's	0	3

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Estrella Mountain Community College Completions (2018)	Regional Completions (2018)
17-3029	Engineering Technicians, Except Drafters, All Other	1,674	1,731	57	3%	172	$55,855.50	Associate's	0	197
19-4011	Agricultural and Food Science Technicians	243	270	27	11%	34	$35,757.38	Associate's	0	0
19-4031	Chemical Technicians	605	681	76	13%	72	$42,147.65	Associate's	0	0
19-4041	Geological and Petroleum Technicians	274	295	21	8%	31	$47,725.52	Associate's	0	0
19-4051	Nuclear Technicians	34	35	1	3%	4	$117,827.24	Associate's	1	1
19-4091	Environmental Science and Protection Technicians, Including	507	572	65	13%	71	$40,235.14	Associate's	0	510
19-4093	Forest and Conservation Technicians	120	134	14	12%	17	$37,936.78	Associate's	0	3
19-4099	Life, Physical, and Social Science Technicians, All Other	829	942	113	14%	117	$45,164.84	Associate's	0	105
23-2011	Paralegals and Legal Assistants	6,017	6,988	971	16%	786	$48,199.56	Associate's	0	500
23-2091	Court Reporters	112	136	24	21%	14	$58,138.81	Certificate	0	206
23-2099	Legal Support Workers, All Other	553	602	49	9%	56	$54,297.60	Associate's	0	294
25-2011	Preschool Teachers, Except Special Education	5,502	6,424	922	17%	690	$27,458.03	Associate's	0	1,311
25-4031	Library Technicians	975	1,026	51	5%	159	$30,741.64	Certificate	0	0
27-4011	Audio and Video Equipment Technicians	1,505	1,732	227	15%	196	$42,254.96	Certificate	0	435
27-4012	Broadcast Technicians	339	361	22	6%	40	$29,657.52	Associate's	0	4
27-4014	Sound Engineering Technicians	141	162	21	15%	18	$40,125.52	Certificate	0	434
29-1124	Radiation Therapists	262	317	55	21%	19	$85,027.87	Associate's	0	0
29-1126	Respiratory Therapists	1,938	2,460	522	27%	169	$58,955.14	Associate's	0	81
29-2021	Dental Hygienists	2,481	3,113	632	25%	251	$91,543.97	Associate's	0	114

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Estrella Mountain Community College Completions (2018)	Regional Completions (2018)
29-2031	Cardiovascular Technologists and Technicians	670	820	150	22%	56	$49,058.77	Associate's	0	25
29-2032	Diagnostic Medical Sonographers	1,629	2,063	434	27%	145	$88,655.29	Associate's	0	32
29-2033	Nuclear Medicine Technologists	224	277	53	24%	19	$86,266.24	Associate's	0	15
29-2034	Radiologic Technologists	2,675	3,331	656	25%	231	$66,838.84	Associate's	0	95
29-2035	Magnetic Resonance Imaging Technologists	664	834	170	26%	58	$84,534.95	Associate's	0	95
29-2041	Emergency Medical Technicians and Paramedics	2,157	2,445	288	13%	181	$36,779.19	Certificate	2	969
29-2051	Dietetic Technicians	1,151	1,290	139	12%	113	$28,180.74	Associate's	0	306
29-2053	Psychiatric Technicians	2,158	2,499	341	16%	223	$34,523.20	Certificate	0	13
29-2054	Respiratory Therapy Technicians	285	176	(109)	(38%)	19	$60,279.40	Associate's	0	105
29-2055	Surgical Technologists	1,819	2,191	372	20%	200	$52,190.36	Certificate	0	121
29-2056	Veterinary Technologists and Technicians	1,087	1,487	400	37%	145	$34,963.93	Associate's	0	427
29-2057	Ophthalmic Medical Technicians	247	393	146	59%	41	$38,228.25	Certificate	0	18
29-2061	Licensed Practical and Licensed Vocational Nurses	5,513	7,434	1,921	35%	683	$55,934.87	Certificate	0	196
29-2071	Medical Records and Health Information Technicians	4,843	5,744	901	19%	430	$37,482.12	Certificate	0	1,412
29-2099	Health Technologists and Technicians, All Other	2,268	2,924	656	29%	242	$43,927.39	Certificate	0	44

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Estrella Mountain Community College Completions (2018)	Regional Completions (2018)
29-9099	Healthcare Practitioners and Technical Workers, All Other	531	648	117	22%	45	$37,976.81	Certificate	0	1
31-1014	Nursing Assistants	10,671	13,906	3,235	30%	1,699	$31,184.15	Certificate	0	542
31-2011	Occupational Therapy Assistants	989	1,281	292	30%	152	$63,688.29	Associate's	0	25
31-2021	Physical Therapist Assistants	1,866	2,337	471	25%	308	$48,250.40	Associate's	0	99
31-9011	Massage Therapists	3,389	4,164	775	23%	516	$36,984.80	Certificate	0	441
31-9091	Dental Assistants	5,163	6,290	1,127	22%	755	$44,093.54	Certificate	0	415
31-9092	Medical Assistants	14,217	18,433	4,216	30%	2,216	$33,777.64	Certificate	0	2,497
31-9094	Medical Transcriptionists	527	684	157	30%	100	$33,876.24	Certificate	0	0
31-9097	Phlebotomists	1,043	1,834	791	76%	230	$31,255.56	Certificate	0	357
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	1,110	1,225	115	10%	85	$79,055.37	Certificate	0	1
33-2011	Firefighters	3,060	3,460	400	13%	262	$53,773.86	Certificate	1	195
33-2021	Fire Inspectors and Investigators	136	154	18	13%	15	$71,940.24	Certificate	1	195
35-2013	Cooks, Private Household	17	20	3	18%	3	$39,410.53	Certificate	23	176
39-4011	Embalmers	62	67	5	8%	11	$48,084.35	Associate's	0	33
39-4031	Morticians, Undertakers, and Funeral Directors	115	138	23	20%	18	$38,599.79	Associate's	0	33
39-5011	Barbers	1,064	1,369	305	29%	166	$18,066.86	Certificate	0	41
39-5012	Hairdressers, Hairstylists, and Cosmetologists	12,119	14,009	1,890	16%	1,826	$24,638.36	Certificate	0	772
39-5091	Makeup Artists, Theatrical and Performance	15	23	8	53%	3	$56,132.98	Certificate	0	760
39-5092	Manicurists and Pedicurists	2,273	2,786	513	23%	340	$23,721.47	Certificate	0	778
39-5094	Skincare Specialists	1,791	2,061	270	15%	247	$31,145.56	Certificate	0	1,465

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Estrella Mountain Community College Completions (2018)	Regional Completions (2018)
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	1,820	1,914	94	5%	221	$40,788.14	Associate's	0	15
43-9031	Desktop Publishers	129	121	(8)	(6%)	15	$33,926.43	Associate's	0	15
49-2021	Radio, Cellular, and Tower Equipment Installers and Repairs	428	453	25	6%	51	$49,612.86	Associate's	0	0
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	2,569	2,988	419	16%	348	$59,770.10	Certificate	0	0
49-2091	Avionics Technicians	332	362	30	9%	28	$65,981.14	Associate's	0	71
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	62	73	11	18%	7	$48,903.17	Certificate	0	1,260
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	596	648	52	9%	60	$63,264.27	Certificate	11	20
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	405	449	44	11%	42	$86,603.04	Certificate	6	107
49-2097	Electronic Home Entertainment Equipment Installers and Repairers	1,533	1,380	(153)	(10%)	160	$45,616.33	Certificate	0	0
49-3011	Aircraft Mechanics and Service Technicians	4,314	4,556	242	6%	391	$64,352.24	Certificate	0	133
49-3023	Automotive Service Technicians and Mechanics	11,618	12,952	1,334	11%	1,329	$39,494.98	Certificate	0	1,260
49-3052	Motorcycle Mechanics	35	41	6	17%	5	$23,268.48	Certificate	0	566

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Estrella Mountain Community College Completions (2018)	Regional Completions (2018)
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	7,525	9,357	1,832	24%	1,014	$43,236.94	Certificate	0	304
49-9062	Medical Equipment Repairers	719	758	39	5%	82	$40,311.56	Associate's	0	6
49-9081	Wind Turbine Service Technicians	76	119	43	57%	15	$49,529.34	Certificate	36	97
49-9092	Commercial Divers	22	27	5	23%	3	$48,907.34	Certificate	0	0
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	217	275	58	27%	31	$56,154.10	Certificate	1	487
51-4111	Tool and Die Makers	494	503	9	2%	51	$52,220.68	Certificate	0	0
51-5111	Prepress Technicians and Workers	171	166	(5)	(3%)	21	$42,810.00	Certificate	0	145
53-2021	Air Traffic Controllers	432	462	30	7%	45	$102,672.99	Associate's	0	12
53-3032	Heavy and Tractor-Trailer Truck Drivers	21,973	24,814	2,841	13%	2,967	$43,022.27	Certificate	0	789
53-5021	Captains, Mates, and Pilots of Water Vessels	483	506	23	5%	49	$76,183.09	Certificate	0	0
53-5022	Motorboat Operators	43	47	4	9%	5	$45,574.76	Certificate	0	0
53-5031	Ship Engineers	49	54	5	10%	7	$65,537.69	Certificate	0	0

Source: Emsi Q2 2020 Data Set May 2020

TABLE 6.4 | ALL OCCUPATIONS IN MARICOPA COUNTY REQUIRING A CERTIFICATE OR ASSOCIATE'S DEGREE | GATEWAY

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	GateWay Community College Completions (2018)	Regional Completions (2018)
11-9061	Funeral Service Managers	89	100	11	12%	8	$75,209.76	Associate's	0	33
13-1032	Insurance Appraisers, Auto Damage	818	895	77	9%	81	$58,653.08	Certificate	0	31
15-1134	Web Developers	2,824	3,383	559	20%	293	$60,171.49	Associate's	22	5,664
15-1152	Computer Network Support Specialists	5,097	5,704	607	12%	505	$53,893.44	Associate's	6	3,095
17-3011	Architectural and Civil Drafters	1,715	1,825	110	6%	194	$59,439.82	Associate's	0	94
17-3012	Electrical and Electronics Drafters	606	654	48	8%	70	$63,596.43	Associate's	0	44
17-3013	Mechanical Drafters	851	857	6	1%	90	$60,160.96	Associate's	0	45
17-3019	Drafters, All Other	295	315	20	7%	34	$52,568.51	Associate's	0	46
17-3021	Aerospace Engineering and Operations Technicians	738	768	30	4%	76	$66,250.81	Associate's	0	0
17-3022	Civil Engineering Technicians	791	871	80	10%	89	$56,470.51	Associate's	0	0
17-3023	Electrical and Electronics Engineering Technicians	2,414	2,385	(29)	(1%)	235	$62,989.50	Associate's	0	127
17-3024	Electro-Mechanical Technicians	322	324	2	1%	32	$50,282.83	Associate's	0	352
17-3025	Environmental Engineering Technicians	218	250	32	15%	26	$46,265.59	Associate's	0	0
17-3026	Industrial Engineering Technicians	2,129	2,101	(28)	(1%)	209	$58,049.39	Associate's	2	80
17-3027	Mechanical Engineering Technicians	700	718	18	3%	71	$57,813.10	Associate's	0	3
17-3029	Engineering Technicians, Except Drafters, All Other	1,674	1,731	57	3%	172	$55,855.50	Associate's	0	197
19-4011	Agricultural and Food Science Technicians	243	270	27	11%	34	$35,757.38	Associate's	0	0
19-4031	Chemical Technicians	605	681	76	13%	72	$42,147.65	Associate's	0	0
19-4041	Geological and Petroleum Technicians	274	295	21	8%	31	$47,725.52	Associate's	0	0
19-4051	Nuclear Technicians	34	35	1	3%	4	$117,827.24	Associate's	0	1
19-4091	Environmental Science and Protection Technicians, Including Health	507	572	65	13%	71	$40,235.14	Associate's	0	510
19-4093	Forest and Conservation Technicians	120	134	14	12%	17	$37,936.78	Associate's	0	3
19-4099	Life, Physical, and Social Science Technicians, All Other	829	942	113	14%	117	$45,164.84	Associate's	0	105

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	GateWay Community College Completions (2018)	Regional Completions (2018)
23-2011	Paralegals and Legal Assistants	6,017	6,988	971	16%	786	$48,199.56	Associate's	0	500
23-2091	Court Reporters	112	136	24	21%	14	$58,138.81	Certificate	0	206
23-2099	Legal Support Workers, All Other	553	602	49	9%	56	$54,297.60	Associate's	0	294
25-2011	Preschool Teachers, Except Special Education	5,502	6,424	922	17%	690	$27,458.03	Associate's	0	1,311
25-4031	Library Technicians	975	1,026	51	5%	159	$30,741.64	Certificate	0	0
27-4011	Audio and Video Equipment Technicians	1,505	1,732	227	15%	196	$42,254.96	Certificate	0	435
27-4012	Broadcast Technicians	339	361	22	6%	40	$29,657.52	Associate's	0	4
27-4014	Sound Engineering Technicians	141	162	21	15%	18	$40,125.52	Certificate	0	434
29-1124	Radiation Therapists	262	317	55	21%	19	$85,027.87	Associate's	0	0
29-1126	Respiratory Therapists	1,938	2,460	522	27%	169	$58,955.14	Associate's	33	81
29-2021	Dental Hygienists	2,481	3,113	632	25%	251	$91,543.97	Associate's	0	114
29-2031	Cardiovascular Technologists and Technicians	670	820	150	22%	56	$49,058.77	Associate's	0	25
29-2032	Diagnostic Medical Sonographers	1,629	2,063	434	27%	145	$88,655.29	Associate's	32	32
29-2033	Nuclear Medicine Technologists	224	277	53	24%	19	$86,266.24	Associate's	15	15
29-2034	Radiologic Technologists	2,675	3,331	656	25%	231	$66,838.84	Associate's	69	95
29-2035	Magnetic Resonance Imaging Technologists	664	834	170	26%	58	$84,534.95	Associate's	69	95
29-2041	Emergency Medical Technicians and Paramedics	2,157	2,445	288	13%	181	$36,779.19	Certificate	0	969
29-2051	Dietetic Technicians	1,151	1,290	139	12%	113	$28,180.74	Associate's	0	306
29-2053	Psychiatric Technicians	2,158	2,499	341	16%	223	$34,523.20	Certificate	0	13
29-2054	Respiratory Therapy Technicians	285	176	(109)	(38%)	19	$60,279.40	Associate's	33	105
29-2055	Surgical Technologists	1,819	2,191	372	20%	200	$52,190.36	Certificate	2	121
29-2056	Veterinary Technologists and Technicians	1,087	1,487	400	37%	145	$34,963.93	Associate's	0	427
29-2057	Ophthalmic Medical Technicians	247	393	146	59%	41	$38,228.25	Certificate	0	18
29-2061	Licensed Practical and Licensed Vocational Nurses	5,513	7,434	1,921	35%	683	$55,934.87	Certificate	121	196
29-2071	Medical Records and Health Information Technicians	4,843	5,744	901	19%	430	$37,482.12	Certificate	0	1,412
29-2099	Health Technologists and Technicians, All Other	2,268	2,924	656	29%	242	$43,927.39	Certificate	23	44

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	GateWay Community College Completions (2018)	Regional Completions (2018)
29-9099	Healthcare Practitioners and Technical Workers, All Other	531	648	117	22%	45	$37,976.81	Certificate	0	1
31-1014	Nursing Assistants	10,671	13,906	3,235	30%	1,699	$31,184.15	Certificate	72	542
31-2011	Occupational Therapy Assistants	989	1,281	292	30%	152	$63,688.29	Associate's	0	25
31-2021	Physical Therapist Assistants	1,866	2,337	471	25%	308	$48,250.40	Associate's	36	99
31-9011	Massage Therapists	3,389	4,164	775	23%	516	$36,984.80	Certificate	0	441
31-9091	Dental Assistants	5,163	6,290	1,127	22%	755	$44,093.54	Certificate	0	415
31-9092	Medical Assistants	14,217	18,433	4,216	30%	2,216	$33,777.64	Certificate	0	2,497
31-9094	Medical Transcriptionists	527	684	157	30%	100	$33,876.24	Certificate	0	0
31-9097	Phlebotomists	1,043	1,834	791	76%	230	$31,255.56	Certificate	0	357
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	1,110	1,225	115	10%	85	$79,055.37	Certificate	0	1
33-2011	Firefighters	3,060	3,460	400	13%	262	$53,773.86	Certificate	0	195
33-2021	Fire Inspectors and Investigators	136	154	18	13%	15	$71,940.24	Certificate	0	195
35-2013	Cooks, Private Household	17	20	3	18%	3	$39,410.53	Certificate	0	176
39-4011	Embalmers	62	67	5	8%	11	$48,084.35	Associate's	0	33
39-4031	Morticians, Undertakers, and Funeral Directors	115	138	23	20%	18	$38,599.79	Associate's	0	33
39-5011	Barbers	1,064	1,369	305	29%	166	$18,066.86	Certificate	0	41
39-5012	Hairdressers, Hairstylists, and Cosmetologists	12,119	14,009	1,890	16%	1,826	$24,638.36	Certificate	0	772
39-5091	Makeup Artists, Theatrical and Performance	15	23	8	53%	3	$56,132.98	Certificate	0	760
39-5092	Manicurists and Pedicurists	2,273	2,786	513	23%	340	$23,721.47	Certificate	0	778
39-5094	Skincare Specialists	1,791	2,061	270	15%	247	$31,145.56	Certificate	0	1,465
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	1,820	1,914	94	5%	221	$40,788.14	Associate's	0	15
43-9031	Desktop Publishers	129	121	(8)	(6%)	15	$33,926.43	Associate's	0	15
49-2021	Radio, Cellular, and Tower Equipment Installers and Repairs	428	453	25	6%	51	$49,612.86	Associate's	0	0
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	2,569	2,988	419	16%	348	$59,770.10	Certificate	0	0
49-2091	Avionics Technicians	332	362	30	9%	28	$65,981.14	Associate's	0	71

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	GateWay Community College Completions (2018)	Regional Completions (2018)
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	62	73	11	18%	7	$48,903.17	Certificate	147	1,260
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	596	648	52	9%	60	$63,264.27	Certificate	0	20
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	405	449	44	11%	42	$86,603.04	Certificate	21	107
49-2097	Electronic Home Entertainment Equipment Installers and Repairers	1,533	1,380	(153)	(10%)	160	$45,616.33	Certificate	0	0
49-3011	Aircraft Mechanics and Service Technicians	4,314	4,556	242	6%	391	$64,352.24	Certificate	0	133
49-3023	Automotive Service Technicians and Mechanics	11,618	12,952	1,334	11%	1,329	$39,494.98	Certificate	147	1,260
49-3052	Motorcycle Mechanics	35	41	6	17%	5	$23,268.48	Certificate	0	566
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	7,525	9,357	1,832	24%	1,014	$43,236.94	Certificate	30	304
49-9062	Medical Equipment Repairers	719	758	39	5%	82	$40,311.56	Associate's	0	6
49-9081	Wind Turbine Service Technicians	76	119	43	57%	15	$49,529.34	Certificate	0	97
49-9092	Commercial Divers	22	27	5	23%	3	$48,907.34	Certificate	0	0
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	217	275	58	27%	31	$56,154.10	Certificate	10	487
51-4111	Tool and Die Makers	494	503	9	2%	51	$52,220.68	Certificate	0	0
51-5111	Prepress Technicians and Workers	171	166	(5)	(3%)	21	$42,810.00	Certificate	0	145
53-2021	Air Traffic Controllers	432	462	30	7%	45	$102,672.99	Associate's	0	12
53-3032	Heavy and Tractor-Trailer Truck Drivers	21,973	24,814	2,841	13%	2,967	$43,022.27	Certificate	0	789
53-5021	Captains, Mates, and Pilots of Water Vessels	483	506	23	5%	49	$76,183.09	Certificate	0	0
53-5022	Motorboat Operators	43	47	4	9%	5	$45,574.76	Certificate	0	0
53-5031	Ship Engineers	49	54	5	10%	7	$65,537.69	Certificate	0	0

Source: Emsi Q2 2020 Data Set May 2020

TABLE 6.5 | ALL OCCUPATIONS IN MARICOPA COUNTY REQUIRING A CERTIFICATE OR ASSOCIATE'S DEGREE | GLENDALE

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Glendale Community College Completions (2018)	Regional Completions (2018)
11-9061	Funeral Service Managers	89	100	11	12%	8	$75,209.76	Associate's	0	33
13-1032	Insurance Appraisers, Auto Damage	818	895	77	9%	81	$58,653.08	Certificate	0	31
15-1134	Web Developers	2,824	3,383	559	20%	293	$60,171.49	Associate's	164	5,664
15-1152	Computer Network Support Specialists	5,097	5,704	607	12%	505	$53,893.44	Associate's	121	3,095
17-3011	Architectural and Civil Drafters	1,715	1,825	110	6%	194	$59,439.82	Associate's	35	94
17-3012	Electrical and Electronics Drafters	606	654	48	8%	70	$63,596.43	Associate's	35	44
17-3013	Mechanical Drafters	851	857	6	1%	90	$60,160.96	Associate's	35	45
17-3019	Drafters, All Other	295	315	20	7%	34	$52,568.51	Associate's	35	46
17-3021	Aerospace Engineering and Operations Technicians	738	768	30	4%	76	$66,250.81	Associate's	0	0
17-3022	Civil Engineering Technicians	791	871	80	10%	89	$56,470.51	Associate's	0	0
17-3023	Electrical and Electronics Engineering Technicians	2,414	2,385	(29)	(1%)	235	$62,989.50	Associate's	18	127
17-3024	Electro-Mechanical Technicians	322	324	2	1%	32	$50,282.83	Associate's	0	352
17-3025	Environmental Engineering Technicians	218	250	32	15%	26	$46,265.59	Associate's	0	0
17-3026	Industrial Engineering Technicians	2,129	2,101	(28)	(1%)	209	$58,049.39	Associate's	0	80
17-3027	Mechanical Engineering Technicians	700	718	18	3%	71	$57,813.10	Associate's	0	3
17-3029	Engineering Technicians, Except Drafters, All Other	1,674	1,731	57	3%	172	$55,855.50	Associate's	0	197
19-4011	Agricultural and Food Science Technicians	243	270	27	11%	34	$35,757.38	Associate's	0	0
19-4031	Chemical Technicians	605	681	76	13%	72	$42,147.65	Associate's	0	0
19-4041	Geological and Petroleum Technicians	274	295	21	8%	31	$47,725.52	Associate's	0	0
19-4051	Nuclear Technicians	34	35	1	3%	4	$117,827.24	Associate's	0	1
19-4091	Environmental Science and Protection Technicians, Including Health	507	572	65	13%	71	$40,235.14	Associate's	0	510
19-4093	Forest and Conservation Technicians	120	134	14	12%	17	$37,936.78	Associate's	0	3
19-4099	Life, Physical, and Social Science Technicians, All Other	829	942	113	14%	117	$45,164.84	Associate's	0	105

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Glendale Community College Completions (2018)	Regional Completions (2018)
23-2011	Paralegals and Legal Assistants	6,017	6,988	971	16%	786	$48,199.56	Associate's	0	500
23-2091	Court Reporters	112	136	24	21%	14	$58,138.81	Certificate	0	206
23-2099	Legal Support Workers, All Other	553	602	49	9%	56	$54,297.60	Associate's	0	294
25-2011	Preschool Teachers, Except Special Education	5,502	6,424	922	17%	690	$27,458.03	Associate's	65	1,311
25-4031	Library Technicians	975	1,026	51	5%	159	$30,741.64	Certificate	0	0
27-4011	Audio and Video Equipment Technicians	1,505	1,732	227	15%	196	$42,254.96	Certificate	20	435
27-4012	Broadcast Technicians	339	361	22	6%	40	$29,657.52	Associate's	0	4
27-4014	Sound Engineering Technicians	141	162	21	15%	18	$40,125.52	Certificate	20	434
29-1124	Radiation Therapists	262	317	55	21%	19	$85,027.87	Associate's	0	0
29-1126	Respiratory Therapists	1,938	2,460	522	27%	169	$58,955.14	Associate's	0	81
29-2021	Dental Hygienists	2,481	3,113	632	25%	251	$91,543.97	Associate's	0	114
29-2031	Cardiovascular Technologists and Technicians	670	820	150	22%	56	$49,058.77	Associate's	0	25
29-2032	Diagnostic Medical Sonographers	1,629	2,063	434	27%	145	$88,655.29	Associate's	0	32
29-2033	Nuclear Medicine Technologists	224	277	53	24%	19	$86,266.24	Associate's	0	15
29-2034	Radiologic Technologists	2,675	3,331	656	25%	231	$66,838.84	Associate's	0	95
29-2035	Magnetic Resonance Imaging Technologists	664	834	170	26%	58	$84,534.95	Associate's	0	95
29-2041	Emergency Medical Technicians and Paramedics	2,157	2,445	288	13%	181	$36,779.19	Certificate	310	969
29-2051	Dietetic Technicians	1,151	1,290	139	12%	113	$28,180.74	Associate's	0	306
29-2053	Psychiatric Technicians	2,158	2,499	341	16%	223	$34,523.20	Certificate	0	13
29-2054	Respiratory Therapy Technicians	285	176	(109)	(38%)	19	$60,279.40	Associate's	0	105
29-2055	Surgical Technologists	1,819	2,191	372	20%	200	$52,190.36	Certificate	0	121
29-2056	Veterinary Technologists and Technicians	1,087	1,487	400	37%	145	$34,963.93	Associate's	0	427
29-2057	Ophthalmic Medical Technicians	247	393	146	59%	41	$38,228.25	Certificate	0	18
29-2061	Licensed Practical and Licensed Vocational Nurses	5,513	7,434	1,921	35%	683	$55,934.87	Certificate	15	196
29-2071	Medical Records and Health Information Technicians	4,843	5,744	901	19%	430	$37,482.12	Certificate	0	1,412
29-2099	Health Technologists and Technicians, All Other	2,268	2,924	656	29%	242	$43,927.39	Certificate	0	44

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Glendale Community College Completions (2018)	Regional Completions (2018)
29-9099	Healthcare Practitioners and Technical Workers, All Other	531	648	117	22%	45	$37,976.81	Certificate	0	1
31-1014	Nursing Assistants	10,671	13,906	3,235	30%	1,699	$31,184.15	Certificate	76	542
31-2011	Occupational Therapy Assistants	989	1,281	292	30%	152	$63,688.29	Associate's	0	25
31-2021	Physical Therapist Assistants	1,866	2,337	471	25%	308	$48,250.40	Associate's	0	99
31-9011	Massage Therapists	3,389	4,164	775	23%	516	$36,984.80	Certificate	0	441
31-9091	Dental Assistants	5,163	6,290	1,127	22%	755	$44,093.54	Certificate	0	415
31-9092	Medical Assistants	14,217	18,433	4,216	30%	2,216	$33,777.64	Certificate	0	2,497
31-9094	Medical Transcriptionists	527	684	157	30%	100	$33,876.24	Certificate	0	0
31-9097	Phlebotomists	1,043	1,834	791	76%	230	$31,255.56	Certificate	0	357
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	1,110	1,225	115	10%	85	$79,055.37	Certificate	0	1
33-2011	Firefighters	3,060	3,460	400	13%	262	$53,773.86	Certificate	75	195
33-2021	Fire Inspectors and Investigators	136	154	18	13%	15	$71,940.24	Certificate	75	195
35-2013	Cooks, Private Household	17	20	3	18%	3	$39,410.53	Certificate	0	176
39-4011	Embalmers	62	67	5	8%	11	$48,084.35	Associate's	0	33
39-4031	Morticians, Undertakers, and Funeral Directors	115	138	23	20%	18	$38,599.79	Associate's	0	33
39-5011	Barbers	1,064	1,369	305	29%	166	$18,066.86	Certificate	0	41
39-5012	Hairdressers, Hairstylists, and Cosmetologists	12,119	14,009	1,890	16%	1,826	$24,638.36	Certificate	0	772
39-5091	Makeup Artists, Theatrical and Performance	15	23	8	53%	3	$56,132.98	Certificate	0	760
39-5092	Manicurists and Pedicurists	2,273	2,786	513	23%	340	$23,721.47	Certificate	0	778
39-5094	Skincare Specialists	1,791	2,061	270	15%	247	$31,145.56	Certificate	0	1,465
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	1,820	1,914	94	5%	221	$40,788.14	Associate's	0	15
43-9031	Desktop Publishers	129	121	(8)	(6%)	15	$33,926.43	Associate's	1	15
49-2021	Radio, Cellular, and Tower Equipment Installers and Repairs	428	453	25	6%	51	$49,612.86	Associate's	0	0
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	2,569	2,988	419	16%	348	$59,770.10	Certificate	0	0
49-2091	Avionics Technicians	332	362	30	9%	28	$65,981.14	Associate's	0	71

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Glendale Community College Completions (2018)	Regional Completions (2018)
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	62	73	11	18%	7	$48,903.17	Certificate	74	1,260
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	596	648	52	9%	60	$63,264.27	Certificate	0	20
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	405	449	44	11%	42	$86,603.04	Certificate	0	107
49-2097	Electronic Home Entertainment Equipment Installers and Repairers	1,533	1,380	(153)	(10%)	160	$45,616.33	Certificate	0	0
49-3011	Aircraft Mechanics and Service Technicians	4,314	4,556	242	6%	391	$64,352.24	Certificate	0	133
49-3023	Automotive Service Technicians and Mechanics	11,618	12,952	1,334	11%	1,329	$39,494.98	Certificate	74	1,260
49-3052	Motorcycle Mechanics	35	41	6	17%	5	$23,268.48	Certificate	0	566
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	7,525	9,357	1,832	24%	1,014	$43,236.94	Certificate	0	304
49-9062	Medical Equipment Repairers	719	758	39	5%	82	$40,311.56	Associate's	0	6
49-9081	Wind Turbine Service Technicians	76	119	43	57%	15	$49,529.34	Certificate	0	97
49-9092	Commercial Divers	22	27	5	23%	3	$48,907.34	Certificate	0	0
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	217	275	58	27%	31	$56,154.10	Certificate	0	487
51-4111	Tool and Die Makers	494	503	9	2%	51	$52,220.68	Certificate	0	0
51-5111	Prepress Technicians and Workers	171	166	(5)	(3%)	21	$42,810.00	Certificate	1	145
53-2021	Air Traffic Controllers	432	462	30	7%	45	$102,672.99	Associate's	0	12
53-3032	Heavy and Tractor-Trailer Truck Drivers	21,973	24,814	2,841	13%	2,967	$43,022.27	Certificate	0	789
53-5021	Captains, Mates, and Pilots of Water Vessels	483	506	23	5%	49	$76,183.09	Certificate	0	0
53-5022	Motorboat Operators	43	47	4	9%	5	$45,574.76	Certificate	0	0
53-5031	Ship Engineers	49	54	5	10%	7	$65,537.69	Certificate	0	0

Source: Emsi Q2 2020 Data Set May 2020

TABLE 6.6 | ALL OCCUPATIONS IN MARICOPA COUNTY REQUIRING A CERTIFICATE OR ASSOCIATE'S DEGREE | MESA

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Mesa Community College Completions (2018)	Regional Completions (2018)
11-9061	Funeral Service Managers	89	100	11	12%	8	$75,209.76	Associate's	2	33
13-1032	Insurance Appraisers, Auto Damage	818	895	77	9%	81	$58,653.08	Certificate	0	31
15-1134	Web Developers	2,824	3,383	559	20%	293	$60,171.49	Associate's	146	5,664
15-1152	Computer Network Support Specialists	5,097	5,704	607	12%	505	$53,893.44	Associate's	154	3,095
17-3011	Architectural and Civil Drafters	1,715	1,825	110	6%	194	$59,439.82	Associate's	9	94
17-3012	Electrical and Electronics Drafters	606	654	48	8%	70	$63,596.43	Associate's	9	44
17-3013	Mechanical Drafters	851	857	6	1%	90	$60,160.96	Associate's	10	45
17-3019	Drafters, All Other	295	315	20	7%	34	$52,568.51	Associate's	11	46
17-3021	Aerospace Engineering and Operations Technicians	738	768	30	4%	76	$66,250.81	Associate's	0	0
17-3022	Civil Engineering Technicians	791	871	80	10%	89	$56,470.51	Associate's	0	0
17-3023	Electrical and Electronics Engineering Technicians	2,414	2,385	(29)	(1%)	235	$62,989.50	Associate's	13	127
17-3024	Electro-Mechanical Technicians	322	324	2	1%	32	$50,282.83	Associate's	2	352
17-3025	Environmental Engineering Technicians	218	250	32	15%	26	$46,265.59	Associate's	0	0
17-3026	Industrial Engineering Technicians	2,129	2,101	(28)	(1%)	209	$58,049.39	Associate's	7	80
17-3027	Mechanical Engineering Technicians	700	718	18	3%	71	$57,813.10	Associate's	0	3
17-3029	Engineering Technicians, Except Drafters, All Other	1,674	1,731	57	3%	172	$55,855.50	Associate's	0	197
19-4011	Agricultural and Food Science Technicians	243	270	27	11%	34	$35,757.38	Associate's	0	0
19-4031	Chemical Technicians	605	681	76	13%	72	$42,147.65	Associate's	0	0
19-4041	Geological and Petroleum Technicians	274	295	21	8%	31	$47,725.52	Associate's	0	0
19-4051	Nuclear Technicians	34	35	1	3%	4	$117,827.24	Associate's	0	1
19-4091	Environmental Science and Protection Technicians, Including Health	507	572	65	13%	71	$40,235.14	Associate's	5	510
19-4093	Forest and Conservation Technicians	120	134	14	12%	17	$37,936.78	Associate's	0	3
19-4099	Life, Physical, and Social Science Technicians, All Other	829	942	113	14%	117	$45,164.84	Associate's	0	105

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Mesa Community College Completions (2018)	Regional Completions (2018)
23-2011	Paralegals and Legal Assistants	6,017	6,988	971	16%	786	$48,199.56	Associate's	0	500
23-2091	Court Reporters	112	136	24	21%	14	$58,138.81	Certificate	0	206
23-2099	Legal Support Workers, All Other	553	602	49	9%	56	$54,297.60	Associate's	0	294
25-2011	Preschool Teachers, Except Special Education	5,502	6,424	922	17%	690	$27,458.03	Associate's	38	1,311
25-4031	Library Technicians	975	1,026	51	5%	159	$30,741.64	Certificate	0	0
27-4011	Audio and Video Equipment Technicians	1,505	1,732	227	15%	196	$42,254.96	Certificate	36	435
27-4012	Broadcast Technicians	339	361	22	6%	40	$29,657.52	Associate's	1	4
27-4014	Sound Engineering Technicians	141	162	21	15%	18	$40,125.52	Certificate	35	434
29-1124	Radiation Therapists	262	317	55	21%	19	$85,027.87	Associate's	0	0
29-1126	Respiratory Therapists	1,938	2,460	522	27%	169	$58,955.14	Associate's	0	81
29-2021	Dental Hygienists	2,481	3,113	632	25%	251	$91,543.97	Associate's	18	114
29-2031	Cardiovascular Technologists and Technicians	670	820	150	22%	56	$49,058.77	Associate's	0	25
29-2032	Diagnostic Medical Sonographers	1,629	2,063	434	27%	145	$88,655.29	Associate's	0	32
29-2033	Nuclear Medicine Technologists	224	277	53	24%	19	$86,266.24	Associate's	0	15
29-2034	Radiologic Technologists	2,675	3,331	656	25%	231	$66,838.84	Associate's	0	95
29-2035	Magnetic Resonance Imaging Technologists	664	834	170	26%	58	$84,534.95	Associate's	0	95
29-2041	Emergency Medical Technicians and Paramedics	2,157	2,445	288	13%	181	$36,779.19	Certificate	179	969
29-2051	Dietetic Technicians	1,151	1,290	139	12%	113	$28,180.74	Associate's	0	306
29-2053	Psychiatric Technicians	2,158	2,499	341	16%	223	$34,523.20	Certificate	0	13
29-2054	Respiratory Therapy Technicians	285	176	(109)	(38%)	19	$60,279.40	Associate's	0	105
29-2055	Surgical Technologists	1,819	2,191	372	20%	200	$52,190.36	Certificate	0	121
29-2056	Veterinary Technologists and Technicians	1,087	1,487	400	37%	145	$34,963.93	Associate's	16	427
29-2057	Ophthalmic Medical Technicians	247	393	146	59%	41	$38,228.25	Certificate	0	18
29-2061	Licensed Practical and Licensed Vocational Nurses	5,513	7,434	1,921	35%	683	$55,934.87	Certificate	2	196
29-2071	Medical Records and Health Information Technicians	4,843	5,744	901	19%	430	$37,482.12	Certificate	0	1,412
29-2099	Health Technologists and Technicians, All Other	2,268	2,924	656	29%	242	$43,927.39	Certificate	0	44

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Mesa Community College Completions (2018)	Regional Completions (2018)
29-9099	Healthcare Practitioners and Technical Workers, All Other	531	648	117	22%	45	$37,976.81	Certificate	0	1
31-1014	Nursing Assistants	10,671	13,906	3,235	30%	1,699	$31,184.15	Certificate	42	542
31-2011	Occupational Therapy Assistants	989	1,281	292	30%	152	$63,688.29	Associate's	0	25
31-2021	Physical Therapist Assistants	1,866	2,337	471	25%	308	$48,250.40	Associate's	0	99
31-9011	Massage Therapists	3,389	4,164	775	23%	516	$36,984.80	Certificate	0	441
31-9091	Dental Assistants	5,163	6,290	1,127	22%	755	$44,093.54	Certificate	0	415
31-9092	Medical Assistants	14,217	18,433	4,216	30%	2,216	$33,777.64	Certificate	0	2,497
31-9094	Medical Transcriptionists	527	684	157	30%	100	$33,876.24	Certificate	0	0
31-9097	Phlebotomists	1,043	1,834	791	76%	230	$31,255.56	Certificate	0	357
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	1,110	1,225	115	10%	85	$79,055.37	Certificate	0	1
33-2011	Firefighters	3,060	3,460	400	13%	262	$53,773.86	Certificate	17	195
33-2021	Fire Inspectors and Investigators	136	154	18	13%	15	$71,940.24	Certificate	17	195
35-2013	Cooks, Private Household	17	20	3	18%	3	$39,410.53	Certificate	0	176
39-4011	Embalmers	62	67	5	8%	11	$48,084.35	Associate's	2	33
39-4031	Morticians, Undertakers, and Funeral Directors	115	138	23	20%	18	$38,599.79	Associate's	2	33
39-5011	Barbers	1,064	1,369	305	29%	166	$18,066.86	Certificate	0	41
39-5012	Hairdressers, Hairstylists, and Cosmetologists	12,119	14,009	1,890	16%	1,826	$24,638.36	Certificate	0	772
39-5091	Makeup Artists, Theatrical and Performance	15	23	8	53%	3	$56,132.98	Certificate	0	760
39-5092	Manicurists and Pedicurists	2,273	2,786	513	23%	340	$23,721.47	Certificate	0	778
39-5094	Skincare Specialists	1,791	2,061	270	15%	247	$31,145.56	Certificate	0	1,465
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	1,820	1,914	94	5%	221	$40,788.14	Associate's	0	15
43-9031	Desktop Publishers	129	121	(8)	(6%)	15	$33,926.43	Associate's	7	15
49-2021	Radio, Cellular, and Tower Equipment Installers and Repairs	428	453	25	6%	51	$49,612.86	Associate's	0	0
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	2,569	2,988	419	16%	348	$59,770.10	Certificate	0	0
49-2091	Avionics Technicians	332	362	30	9%	28	$65,981.14	Associate's	0	71

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Mesa Community College Completions (2018)	Regional Completions (2018)
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	62	73	11	18%	7	$48,903.17	Certificate	80	1,260
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	596	648	52	9%	60	$63,264.27	Certificate	0	20
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	405	449	44	11%	42	$86,603.04	Certificate	0	107
49-2097	Electronic Home Entertainment Equipment Installers and Repairers	1,533	1,380	(153)	(10%)	160	$45,616.33	Certificate	0	0
49-3011	Aircraft Mechanics and Service Technicians	4,314	4,556	242	6%	391	$64,352.24	Certificate	0	133
49-3023	Automotive Service Technicians and Mechanics	11,618	12,952	1,334	11%	1,329	$39,494.98	Certificate	80	1,260
49-3052	Motorcycle Mechanics	35	41	6	17%	5	$23,268.48	Certificate	0	566
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	7,525	9,357	1,832	24%	1,014	$43,236.94	Certificate	0	304
49-9062	Medical Equipment Repairers	719	758	39	5%	82	$40,311.56	Associate's	0	6
49-9081	Wind Turbine Service Technicians	76	119	43	57%	15	$49,529.34	Certificate	0	97
49-9092	Commercial Divers	22	27	5	23%	3	$48,907.34	Certificate	0	0
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	217	275	58	27%	31	$56,154.10	Certificate	2	487
51-4111	Tool and Die Makers	494	503	9	2%	51	$52,220.68	Certificate	0	0
51-5111	Prepress Technicians and Workers	171	166	(5)	(3%)	21	$42,810.00	Certificate	7	145
53-2021	Air Traffic Controllers	432	462	30	7%	45	$102,672.99	Associate's	0	12
53-3032	Heavy and Tractor-Trailer Truck Drivers	21,973	24,814	2,841	13%	2,967	$43,022.27	Certificate	0	789
53-5021	Captains, Mates, and Pilots of Water Vessels	483	506	23	5%	49	$76,183.09	Certificate	0	0
53-5022	Motorboat Operators	43	47	4	9%	5	$45,574.76	Certificate	0	0
53-5031	Ship Engineers	49	54	5	10%	7	$65,537.69	Certificate	0	0

Source: Emsi Q2 2020 Data Set May 2020

TABLE 6.7 | ALL OCCUPATIONS IN MARICOPA COUNTY REQUIRING A CERTIFICATE OR ASSOCIATE'S DEGREE | PARADISE VALLEY

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Paradise Valley Community College Completions (2018)	Regional Completions (2018)
11-9061	Funeral Service Managers	89	100	11	12%	8	$75,209.76	Associate's	0	33
13-1032	Insurance Appraisers, Auto Damage	818	895	77	9%	81	$58,653.08	Certificate	0	31
15-1134	Web Developers	2,824	3,383	559	20%	293	$60,171.49	Associate's	25	5,664
15-1152	Computer Network Support Specialists	5,097	5,704	607	12%	505	$53,893.44	Associate's	3	3,095
17-3011	Architectural and Civil Drafters	1,715	1,825	110	6%	194	$59,439.82	Associate's	0	94
17-3012	Electrical and Electronics Drafters	606	654	48	8%	70	$63,596.43	Associate's	0	44
17-3013	Mechanical Drafters	851	857	6	1%	90	$60,160.96	Associate's	0	45
17-3019	Drafters, All Other	295	315	20	7%	34	$52,568.51	Associate's	0	46
17-3021	Aerospace Engineering and Operations Technicians	738	768	30	4%	76	$66,250.81	Associate's	0	0
17-3022	Civil Engineering Technicians	791	871	80	10%	89	$56,470.51	Associate's	0	0
17-3023	Electrical and Electronics Engineering Technicians	2,414	2,385	(29)	(1%)	235	$62,989.50	Associate's	0	127
17-3024	Electro-Mechanical Technicians	322	324	2	1%	32	$50,282.83	Associate's	0	352
17-3025	Environmental Engineering Technicians	218	250	32	15%	26	$46,265.59	Associate's	0	0
17-3026	Industrial Engineering Technicians	2,129	2,101	(28)	(1%)	209	$58,049.39	Associate's	0	80
17-3027	Mechanical Engineering Technicians	700	718	18	3%	71	$57,813.10	Associate's	0	3
17-3029	Engineering Technicians, Except Drafters, All Other	1,674	1,731	57	3%	172	$55,855.50	Associate's	0	197
19-4011	Agricultural and Food Science Technicians	243	270	27	11%	34	$35,757.38	Associate's	0	0
19-4031	Chemical Technicians	605	681	76	13%	72	$42,147.65	Associate's	0	0
19-4041	Geological and Petroleum Technicians	274	295	21	8%	31	$47,725.52	Associate's	0	0
19-4051	Nuclear Technicians	34	35	1	3%	4	$117,827.24	Associate's	0	1
19-4091	Environmental Science and Protection Technicians, Including Health	507	572	65	13%	71	$40,235.14	Associate's	1	510
19-4093	Forest and Conservation Technicians	120	134	14	12%	17	$37,936.78	Associate's	0	3
19-4099	Life, Physical, and Social Science Technicians, All Other	829	942	113	14%	117	$45,164.84	Associate's	0	105

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Paradise Valley Community College Completions (2018)	Regional Completions (2018)
23-2011	Paralegals and Legal Assistants	6,017	6,988	971	16%	786	$48,199.56	Associate's	0	500
23-2091	Court Reporters	112	136	24	21%	14	$58,138.81	Certificate	0	206
23-2099	Legal Support Workers, All Other	553	602	49	9%	56	$54,297.60	Associate's	0	294
25-2011	Preschool Teachers, Except Special Education	5,502	6,424	922	17%	690	$27,458.03	Associate's	25	1,311
25-4031	Library Technicians	975	1,026	51	5%	159	$30,741.64	Certificate	0	0
27-4011	Audio and Video Equipment Technicians	1,505	1,732	227	15%	196	$42,254.96	Certificate	4	435
27-4012	Broadcast Technicians	339	361	22	6%	40	$29,657.52	Associate's	0	4
27-4014	Sound Engineering Technicians	141	162	21	15%	18	$40,125.52	Certificate	4	434
29-1124	Radiation Therapists	262	317	55	21%	19	$85,027.87	Associate's	0	0
29-1126	Respiratory Therapists	1,938	2,460	522	27%	169	$58,955.14	Associate's	0	81
29-2021	Dental Hygienists	2,481	3,113	632	25%	251	$91,543.97	Associate's	0	114
29-2031	Cardiovascular Technologists and Technicians	670	820	150	22%	56	$49,058.77	Associate's	0	25
29-2032	Diagnostic Medical Sonographers	1,629	2,063	434	27%	145	$88,655.29	Associate's	0	32
29-2033	Nuclear Medicine Technologists	224	277	53	24%	19	$86,266.24	Associate's	0	15
29-2034	Radiologic Technologists	2,675	3,331	656	25%	231	$66,838.84	Associate's	0	95
29-2035	Magnetic Resonance Imaging Technologists	664	834	170	26%	58	$84,534.95	Associate's	0	95
29-2041	Emergency Medical Technicians and Paramedics	2,157	2,445	288	13%	181	$36,779.19	Certificate	272	969
29-2051	Dietetic Technicians	1,151	1,290	139	12%	113	$28,180.74	Associate's	15	306
29-2053	Psychiatric Technicians	2,158	2,499	341	16%	223	$34,523.20	Certificate	0	13
29-2054	Respiratory Therapy Technicians	285	176	(109)	(38%)	19	$60,279.40	Associate's	0	105
29-2055	Surgical Technologists	1,819	2,191	372	20%	200	$52,190.36	Certificate	0	121
29-2056	Veterinary Technologists and Technicians	1,087	1,487	400	37%	145	$34,963.93	Associate's	0	427
29-2057	Ophthalmic Medical Technicians	247	393	146	59%	41	$38,228.25	Certificate	0	18
29-2061	Licensed Practical and Licensed Vocational Nurses	5,513	7,434	1,921	35%	683	$55,934.87	Certificate	1	196
29-2071	Medical Records and Health Information Technicians	4,843	5,744	901	19%	430	$37,482.12	Certificate	0	1,412
29-2099	Health Technologists and Technicians, All Other	2,268	2,924	656	29%	242	$43,927.39	Certificate	0	44

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Paradise Valley Community College Completions (2018)	Regional Completions (2018)
29-9099	Healthcare Practitioners and Technical Workers, All Other	531	648	117	22%	45	$37,976.81	Certificate	0	1
31-1014	Nursing Assistants	10,671	13,906	3,235	30%	1,699	$31,184.15	Certificate	12	542
31-2011	Occupational Therapy Assistants	989	1,281	292	30%	152	$63,688.29	Associate's	0	25
31-2021	Physical Therapist Assistants	1,866	2,337	471	25%	308	$48,250.40	Associate's	0	99
31-9011	Massage Therapists	3,389	4,164	775	23%	516	$36,984.80	Certificate	0	441
31-9091	Dental Assistants	5,163	6,290	1,127	22%	755	$44,093.54	Certificate	0	415
31-9092	Medical Assistants	14,217	18,433	4,216	30%	2,216	$33,777.64	Certificate	0	2,497
31-9094	Medical Transcriptionists	527	684	157	30%	100	$33,876.24	Certificate	0	0
31-9097	Phlebotomists	1,043	1,834	791	76%	230	$31,255.56	Certificate	0	357
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	1,110	1,225	115	10%	85	$79,055.37	Certificate	1	1
33-2011	Firefighters	3,060	3,460	400	13%	262	$53,773.86	Certificate	82	195
33-2021	Fire Inspectors and Investigators	136	154	18	13%	15	$71,940.24	Certificate	82	195
35-2013	Cooks, Private Household	17	20	3	18%	3	$39,410.53	Certificate	0	176
39-4011	Embalmers	62	67	5	8%	11	$48,084.35	Associate's	0	33
39-4031	Morticians, Undertakers, and Funeral Directors	115	138	23	20%	18	$38,599.79	Associate's	0	33
39-5011	Barbers	1,064	1,369	305	29%	166	$18,066.86	Certificate	0	41
39-5012	Hairdressers, Hairstylists, and Cosmetologists	12,119	14,009	1,890	16%	1,826	$24,638.36	Certificate	0	772
39-5091	Makeup Artists, Theatrical and Performance	15	23	8	53%	3	$56,132.98	Certificate	0	760
39-5092	Manicurists and Pedicurists	2,273	2,786	513	23%	340	$23,721.47	Certificate	0	778
39-5094	Skincare Specialists	1,791	2,061	270	15%	247	$31,145.56	Certificate	0	1,465
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	1,820	1,914	94	5%	221	$40,788.14	Associate's	0	15
43-9031	Desktop Publishers	129	121	(8)	(6%)	15	$33,926.43	Associate's	3	15
49-2021	Radio, Cellular, and Tower Equipment Installers and Repairs	428	453	25	6%	51	$49,612.86	Associate's	0	0
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	2,569	2,988	419	16%	348	$59,770.10	Certificate	0	0
49-2091	Avionics Technicians	332	362	30	9%	28	$65,981.14	Associate's	0	71

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Paradise Valley Community College Completions (2018)	Regional Completions (2018)
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	62	73	11	18%	7	$48,903.17	Certificate	0	1,260
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	596	648	52	9%	60	$63,264.27	Certificate	1	20
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	405	449	44	11%	42	$86,603.04	Certificate	0	107
49-2097	Electronic Home Entertainment Equipment Installers and Repairers	1,533	1,380	(153)	(10%)	160	$45,616.33	Certificate	0	0
49-3011	Aircraft Mechanics and Service Technicians	4,314	4,556	242	6%	391	$64,352.24	Certificate	0	133
49-3023	Automotive Service Technicians and Mechanics	11,618	12,952	1,334	11%	1,329	$39,494.98	Certificate	0	1,260
49-3052	Motorcycle Mechanics	35	41	6	17%	5	$23,268.48	Certificate	0	566
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	7,525	9,357	1,832	24%	1,014	$43,236.94	Certificate	0	304
49-9062	Medical Equipment Repairers	719	758	39	5%	82	$40,311.56	Associate's	0	6
49-9081	Wind Turbine Service Technicians	76	119	43	57%	15	$49,529.34	Certificate	0	97
49-9092	Commercial Divers	22	27	5	23%	3	$48,907.34	Certificate	0	0
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	217	275	58	27%	31	$56,154.10	Certificate	0	487
51-4111	Tool and Die Makers	494	503	9	2%	51	$52,220.68	Certificate	0	0
51-5111	Prepress Technicians and Workers	171	166	(5)	(3%)	21	$42,810.00	Certificate	3	145
53-2021	Air Traffic Controllers	432	462	30	7%	45	$102,672.99	Associate's	0	12
53-3032	Heavy and Tractor-Trailer Truck Drivers	21,973	24,814	2,841	13%	2,967	$43,022.27	Certificate	0	789
53-5021	Captains, Mates, and Pilots of Water Vessels	483	506	23	5%	49	$76,183.09	Certificate	0	0
53-5022	Motorboat Operators	43	47	4	9%	5	$45,574.76	Certificate	0	0
53-5031	Ship Engineers	49	54	5	10%	7	$65,537.69	Certificate	0	0

Source: Emsi Q2 2020 Data Set May 2020

TABLE 6.8 | ALL OCCUPATIONS IN MARICOPA COUNTY REQUIRING A CERTIFICATE OR ASSOCIATE'S DEGREE | PHOENIX COLLEGE

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Phoenix College Completions (2018)	Regional Completions (2018)
11-9061	Funeral Service Managers	89	100	11	12%	8	$75,209.76	Associate's	0	33
13-1032	Insurance Appraisers, Auto Damage	818	895	77	9%	81	$58,653.08	Certificate	0	31
15-1134	Web Developers	2,824	3,383	559	20%	293	$60,171.49	Associate's	29	5,664
15-1152	Computer Network Support Specialists	5,097	5,704	607	12%	505	$53,893.44	Associate's	8	3,095
17-3011	Architectural and Civil Drafters	1,715	1,825	110	6%	194	$59,439.82	Associate's	0	94
17-3012	Electrical and Electronics Drafters	606	654	48	8%	70	$63,596.43	Associate's	0	44
17-3013	Mechanical Drafters	851	857	6	1%	90	$60,160.96	Associate's	0	45
17-3019	Drafters, All Other	295	315	20	7%	34	$52,568.51	Associate's	0	46
17-3021	Aerospace Engineering and Operations Technicians	738	768	30	4%	76	$66,250.81	Associate's	0	0
17-3022	Civil Engineering Technicians	791	871	80	10%	89	$56,470.51	Associate's	0	0
17-3023	Electrical and Electronics Engineering Technicians	2,414	2,385	(29)	(1%)	235	$62,989.50	Associate's	0	127
17-3024	Electro-Mechanical Technicians	322	324	2	1%	32	$50,282.83	Associate's	0	352
17-3025	Environmental Engineering Technicians	218	250	32	15%	26	$46,265.59	Associate's	0	0
17-3026	Industrial Engineering Technicians	2,129	2,101	(28)	(1%)	209	$58,049.39	Associate's	0	80
17-3027	Mechanical Engineering Technicians	700	718	18	3%	71	$57,813.10	Associate's	0	3
17-3029	Engineering Technicians, Except Drafters, All Other	1,674	1,731	57	3%	172	$55,855.50	Associate's	0	197
19-4011	Agricultural and Food Science Technicians	243	270	27	11%	34	$35,757.38	Associate's	0	0
19-4031	Chemical Technicians	605	681	76	13%	72	$42,147.65	Associate's	0	0
19-4041	Geological and Petroleum Technicians	274	295	21	8%	31	$47,725.52	Associate's	0	0
19-4051	Nuclear Technicians	34	35	1	3%	4	$117,827.24	Associate's	0	1
19-4091	Environmental Science and Protection Technicians, Including Health	507	572	65	13%	71	$40,235.14	Associate's	0	510
19-4093	Forest and Conservation Technicians	120	134	14	12%	17	$37,936.78	Associate's	3	3
19-4099	Life, Physical, and Social Science Technicians, All Other	829	942	113	14%	117	$45,164.84	Associate's	0	105
23-2011	Paralegals and Legal Assistants	6,017	6,988	971	16%	786	$48,199.56	Associate's	85	500
23-2091	Court Reporters	112	136	24	21%	14	$58,138.81	Certificate	0	206

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Phoenix College Completions (2018)	Regional Completions (2018)
23-2099	Legal Support Workers, All Other	553	602	49	9%	56	$54,297.60	Associate's	85	294
25-2011	Preschool Teachers, Except Special Education	5,502	6,424	922	17%	690	$27,458.03	Associate's	15	1,311
25-4031	Library Technicians	975	1,026	51	5%	159	$30,741.64	Certificate	0	0
27-4011	Audio and Video Equipment Technicians	1,505	1,732	227	15%	196	$42,254.96	Certificate	9	435
27-4012	Broadcast Technicians	339	361	22	6%	40	$29,657.52	Associate's	0	4
27-4014	Sound Engineering Technicians	141	162	21	15%	18	$40,125.52	Certificate	9	434
29-1124	Radiation Therapists	262	317	55	21%	19	$85,027.87	Associate's	0	0
29-1126	Respiratory Therapists	1,938	2,460	522	27%	169	$58,955.14	Associate's	0	81
29-2021	Dental Hygienists	2,481	3,113	632	25%	251	$91,543.97	Associate's	20	114
29-2031	Cardiovascular Technologists and Technicians	670	820	150	22%	56	$49,058.77	Associate's	0	25
29-2032	Diagnostic Medical Sonographers	1,629	2,063	434	27%	145	$88,655.29	Associate's	0	32
29-2033	Nuclear Medicine Technologists	224	277	53	24%	19	$86,266.24	Associate's	0	15
29-2034	Radiologic Technologists	2,675	3,331	656	25%	231	$66,838.84	Associate's	0	95
29-2035	Magnetic Resonance Imaging Technologists	664	834	170	26%	58	$84,534.95	Associate's	0	95
29-2041	Emergency Medical Technicians and Paramedics	2,157	2,445	288	13%	181	$36,779.19	Certificate	67	969
29-2051	Dietetic Technicians	1,151	1,290	139	12%	113	$28,180.74	Associate's	0	306
29-2053	Psychiatric Technicians	2,158	2,499	341	16%	223	$34,523.20	Certificate	0	13
29-2054	Respiratory Therapy Technicians	285	176	(109)	(38%)	19	$60,279.40	Associate's	0	105
29-2055	Surgical Technologists	1,819	2,191	372	20%	200	$52,190.36	Certificate	0	121
29-2056	Veterinary Technologists and Technicians	1,087	1,487	400	37%	145	$34,963.93	Associate's	0	427
29-2057	Ophthalmic Medical Technicians	247	393	146	59%	41	$38,228.25	Certificate	0	18
29-2061	Licensed Practical and Licensed Vocational Nurses	5,513	7,434	1,921	35%	683	$55,934.87	Certificate	0	196
29-2071	Medical Records and Health Information Technicians	4,843	5,744	901	19%	430	$37,482.12	Certificate	43	1,412
29-2099	Health Technologists and Technicians, All Other	2,268	2,924	656	29%	242	$43,927.39	Certificate	0	44
29-9099	Healthcare Practitioners and Technical Workers, All Other	531	648	117	22%	45	$37,976.81	Certificate	0	1
31-1014	Nursing Assistants	10,671	13,906	3,235	30%	1,699	$31,184.15	Certificate	0	542
31-2011	Occupational Therapy Assistants	989	1,281	292	30%	152	$63,688.29	Associate's	0	25

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Phoenix College Completions (2018)	Regional Completions (2018)
31-2021	Physical Therapist Assistants	1,866	2,337	471	25%	308	$48,250.40	Associate's	0	99
31-9011	Massage Therapists	3,389	4,164	775	23%	516	$36,984.80	Certificate	25	441
31-9091	Dental Assistants	5,163	6,290	1,127	22%	755	$44,093.54	Certificate	44	415
31-9092	Medical Assistants	14,217	18,433	4,216	30%	2,216	$33,777.64	Certificate	61	2,497
31-9094	Medical Transcriptionists	527	684	157	30%	100	$33,876.24	Certificate	0	0
31-9097	Phlebotomists	1,043	1,834	791	76%	230	$31,255.56	Certificate	29	357
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	1,110	1,225	115	10%	85	$79,055.37	Certificate	0	1
33-2011	Firefighters	3,060	3,460	400	13%	262	$53,773.86	Certificate	19	195
33-2021	Fire Inspectors and Investigators	136	154	18	13%	15	$71,940.24	Certificate	19	195
35-2013	Cooks, Private Household	17	20	3	18%	3	$39,410.53	Certificate	7	176
39-4011	Embalmers	62	67	5	8%	11	$48,084.35	Associate's	0	33
39-4031	Morticians, Undertakers, and Funeral Directors	115	138	23	20%	18	$38,599.79	Associate's	0	33
39-5011	Barbers	1,064	1,369	305	29%	166	$18,066.86	Certificate	0	41
39-5012	Hairdressers, Hairstylists, and Cosmetologists	12,119	14,009	1,890	16%	1,826	$24,638.36	Certificate	0	772
39-5091	Makeup Artists, Theatrical and Performance	15	23	8	53%	3	$56,132.98	Certificate	0	760
39-5092	Manicurists and Pedicurists	2,273	2,786	513	23%	340	$23,721.47	Certificate	0	778
39-5094	Skincare Specialists	1,791	2,061	270	15%	247	$31,145.56	Certificate	0	1,465
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	1,820	1,914	94	5%	221	$40,788.14	Associate's	0	15
43-9031	Desktop Publishers	129	121	(8)	(6%)	15	$33,926.43	Associate's	0	15
49-2021	Radio, Cellular, and Tower Equipment Installers and Repairs	428	453	25	6%	51	$49,612.86	Associate's	0	0
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	2,569	2,988	419	16%	348	$59,770.10	Certificate	0	0
49-2091	Avionics Technicians	332	362	30	9%	28	$65,981.14	Associate's	0	71
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	62	73	11	18%	7	$48,903.17	Certificate	0	1,260
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	596	648	52	9%	60	$63,264.27	Certificate	0	20
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	405	449	44	11%	42	$86,603.04	Certificate	0	107

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Phoenix College Completions (2018)	Regional Completions (2018)
49-2097	Electronic Home Entertainment Equipment Installers and Repairers	1,533	1,380	(153)	(10%)	160	$45,616.33	Certificate	0	0
49-3011	Aircraft Mechanics and Service Technicians	4,314	4,556	242	6%	391	$64,352.24	Certificate	0	133
49-3023	Automotive Service Technicians and Mechanics	11,618	12,952	1,334	11%	1,329	$39,494.98	Certificate	0	1,260
49-3052	Motorcycle Mechanics	35	41	6	17%	5	$23,268.48	Certificate	0	566
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	7,525	9,357	1,832	24%	1,014	$43,236.94	Certificate	0	304
49-9062	Medical Equipment Repairers	719	758	39	5%	82	$40,311.56	Associate's	0	6
49-9081	Wind Turbine Service Technicians	76	119	43	57%	15	$49,529.34	Certificate	0	97
49-9092	Commercial Divers	22	27	5	23%	3	$48,907.34	Certificate	0	0
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	217	275	58	27%	31	$56,154.10	Certificate	0	487
51-4111	Tool and Die Makers	494	503	9	2%	51	$52,220.68	Certificate	0	0
51-5111	Prepress Technicians and Workers	171	166	(5)	(3%)	21	$42,810.00	Certificate	0	145
53-2021	Air Traffic Controllers	432	462	30	7%	45	$102,672.99	Associate's	0	12
53-3032	Heavy and Tractor-Trailer Truck Drivers	21,973	24,814	2,841	13%	2,967	$43,022.27	Certificate	0	789
53-5021	Captains, Mates, and Pilots of Water Vessels	483	506	23	5%	49	$76,183.09	Certificate	0	0
53-5022	Motorboat Operators	43	47	4	9%	5	$45,574.76	Certificate	0	0
53-5031	Ship Engineers	49	54	5	10%	7	$65,537.69	Certificate	0	0

Source: Emsi Q2 2020 Data Set May 2020

TABLE 6.9 | ALL OCCUPATIONS IN MARICOPA COUNTY REQUIRING A CERTIFICATE OR ASSOCIATE'S DEGREE | RIO SALADO

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Rio Salado College Completions (2018)	Regional Completions (2018)
11-9061	Funeral Service Managers	89	100	11	12%	8	$75,209.76	Associate's	0	33
13-1032	Insurance Appraisers, Auto Damage	818	895	77	9%	81	$58,653.08	Certificate	6	31
15-1134	Web Developers	2,824	3,383	559	20%	293	$60,171.49	Associate's	40	5,664
15-1152	Computer Network Support Specialists	5,097	5,704	607	12%	505	$53,893.44	Associate's	135	3,095
17-3011	Architectural and Civil Drafters	1,715	1,825	110	6%	194	$59,439.82	Associate's	0	94
17-3012	Electrical and Electronics Drafters	606	654	48	8%	70	$63,596.43	Associate's	0	44
17-3013	Mechanical Drafters	851	857	6	1%	90	$60,160.96	Associate's	0	45
17-3019	Drafters, All Other	295	315	20	7%	34	$52,568.51	Associate's	0	46
17-3021	Aerospace Engineering and Operations Technicians	738	768	30	4%	76	$66,250.81	Associate's	0	0
17-3022	Civil Engineering Technicians	791	871	80	10%	89	$56,470.51	Associate's	0	0
17-3023	Electrical and Electronics Engineering Technicians	2,414	2,385	(29)	(1%)	235	$62,989.50	Associate's	0	127
17-3024	Electro-Mechanical Technicians	322	324	2	1%	32	$50,282.83	Associate's	0	352
17-3025	Environmental Engineering Technicians	218	250	32	15%	26	$46,265.59	Associate's	0	0
17-3026	Industrial Engineering Technicians	2,129	2,101	(28)	(1%)	209	$58,049.39	Associate's	0	80
17-3027	Mechanical Engineering Technicians	700	718	18	3%	71	$57,813.10	Associate's	0	3
17-3029	Engineering Technicians, Except Drafters, All Other	1,674	1,731	57	3%	172	$55,855.50	Associate's	0	197
19-4011	Agricultural and Food Science Technicians	243	270	27	11%	34	$35,757.38	Associate's	0	0
19-4031	Chemical Technicians	605	681	76	13%	72	$42,147.65	Associate's	0	0
19-4041	Geological and Petroleum Technicians	274	295	21	8%	31	$47,725.52	Associate's	0	0
19-4051	Nuclear Technicians	34	35	1	3%	4	$117,827.24	Associate's	0	1
19-4091	Environmental Science and Protection Technicians, Including Health	507	572	65	13%	71	$40,235.14	Associate's	1	510
19-4093	Forest and Conservation Technicians	120	134	14	12%	17	$37,936.78	Associate's	0	3
19-4099	Life, Physical, and Social Science Technicians, All Other	829	942	113	14%	117	$45,164.84	Associate's	0	105
23-2011	Paralegals and Legal Assistants	6,017	6,988	971	16%	786	$48,199.56	Associate's	52	500

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Rio Salado College Completions (2018)	Regional Completions (2018)
23-2091	Court Reporters	112	136	24	21%	14	$58,138.81	Certificate	0	206
23-2099	Legal Support Workers, All Other	553	602	49	9%	56	$54,297.60	Associate's	52	294
25-2011	Preschool Teachers, Except Special Education	5,502	6,424	922	17%	690	$27,458.03	Associate's	50	1,311
25-4031	Library Technicians	975	1,026	51	5%	159	$30,741.64	Certificate	0	0
27-4011	Audio and Video Equipment Technicians	1,505	1,732	227	15%	196	$42,254.96	Certificate	0	435
27-4012	Broadcast Technicians	339	361	22	6%	40	$29,657.52	Associate's	0	4
27-4014	Sound Engineering Technicians	141	162	21	15%	18	$40,125.52	Certificate	0	434
29-1124	Radiation Therapists	262	317	55	21%	19	$85,027.87	Associate's	0	0
29-1126	Respiratory Therapists	1,938	2,460	522	27%	169	$58,955.14	Associate's	0	81
29-2021	Dental Hygienists	2,481	3,113	632	25%	251	$91,543.97	Associate's	21	114
29-2031	Cardiovascular Technologists and Technicians	670	820	150	22%	56	$49,058.77	Associate's	0	25
29-2032	Diagnostic Medical Sonographers	1,629	2,063	434	27%	145	$88,655.29	Associate's	0	32
29-2033	Nuclear Medicine Technologists	224	277	53	24%	19	$86,266.24	Associate's	0	15
29-2034	Radiologic Technologists	2,675	3,331	656	25%	231	$66,838.84	Associate's	0	95
29-2035	Magnetic Resonance Imaging Technologists	664	834	170	26%	58	$84,534.95	Associate's	0	95
29-2041	Emergency Medical Technicians and Paramedics	2,157	2,445	288	13%	181	$36,779.19	Certificate	0	969
29-2051	Dietetic Technicians	1,151	1,290	139	12%	113	$28,180.74	Associate's	0	306
29-2053	Psychiatric Technicians	2,158	2,499	341	16%	223	$34,523.20	Certificate	0	13
29-2054	Respiratory Therapy Technicians	285	176	(109)	(38%)	19	$60,279.40	Associate's	0	105
29-2055	Surgical Technologists	1,819	2,191	372	20%	200	$52,190.36	Certificate	0	121
29-2056	Veterinary Technologists and Technicians	1,087	1,487	400	37%	145	$34,963.93	Associate's	0	427
29-2057	Ophthalmic Medical Technicians	247	393	146	59%	41	$38,228.25	Certificate	0	18
29-2061	Licensed Practical and Licensed Vocational Nurses	5,513	7,434	1,921	35%	683	$55,934.87	Certificate	0	196
29-2071	Medical Records and Health Information Technicians	4,843	5,744	901	19%	430	$37,482.12	Certificate	0	1,412
29-2099	Health Technologists and Technicians, All Other	2,268	2,924	656	29%	242	$43,927.39	Certificate	0	44
29-9099	Healthcare Practitioners and Technical Workers, All Other	531	648	117	22%	45	$37,976.81	Certificate	0	1
31-1014	Nursing Assistants	10,671	13,906	3,235	30%	1,699	$31,184.15	Certificate	0	542

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Rio Salado College Completions (2018)	Regional Completions (2018)
31-2011	Occupational Therapy Assistants	989	1,281	292	30%	152	$63,688.29	Associate's	0	25
31-2021	Physical Therapist Assistants	1,866	2,337	471	25%	308	$48,250.40	Associate's	0	99
31-9011	Massage Therapists	3,389	4,164	775	23%	516	$36,984.80	Certificate	0	441
31-9091	Dental Assistants	5,163	6,290	1,127	22%	755	$44,093.54	Certificate	12	415
31-9092	Medical Assistants	14,217	18,433	4,216	30%	2,216	$33,777.64	Certificate	0	2,497
31-9094	Medical Transcriptionists	527	684	157	30%	100	$33,876.24	Certificate	0	0
31-9097	Phlebotomists	1,043	1,834	791	76%	230	$31,255.56	Certificate	0	357
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	1,110	1,225	115	10%	85	$79,055.37	Certificate	0	1
33-2011	Firefighters	3,060	3,460	400	13%	262	$53,773.86	Certificate	0	195
33-2021	Fire Inspectors and Investigators	136	154	18	13%	15	$71,940.24	Certificate	0	195
35-2013	Cooks, Private Household	17	20	3	18%	3	$39,410.53	Certificate	0	176
39-4011	Embalmers	62	67	5	8%	11	$48,084.35	Associate's	0	33
39-4031	Morticians, Undertakers, and Funeral Directors	115	138	23	20%	18	$38,599.79	Associate's	0	33
39-5011	Barbers	1,064	1,369	305	29%	166	$18,066.86	Certificate	0	41
39-5012	Hairdressers, Hairstylists, and Cosmetologists	12,119	14,009	1,890	16%	1,826	$24,638.36	Certificate	0	772
39-5091	Makeup Artists, Theatrical and Performance	15	23	8	53%	3	$56,132.98	Certificate	0	760
39-5092	Manicurists and Pedicurists	2,273	2,786	513	23%	340	$23,721.47	Certificate	0	778
39-5094	Skincare Specialists	1,791	2,061	270	15%	247	$31,145.56	Certificate	0	1,465
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	1,820	1,914	94	5%	221	$40,788.14	Associate's	15	15
43-9031	Desktop Publishers	129	121	(8)	(6%)	15	$33,926.43	Associate's	0	15
49-2021	Radio, Cellular, and Tower Equipment Installers and Repairs	428	453	25	6%	51	$49,612.86	Associate's	0	0
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	2,569	2,988	419	16%	348	$59,770.10	Certificate	0	0
49-2091	Avionics Technicians	332	362	30	9%	28	$65,981.14	Associate's	0	71
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	62	73	11	18%	7	$48,903.17	Certificate	73	1,260
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	596	648	52	9%	60	$63,264.27	Certificate	0	20

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Rio Salado College Completions (2018)	Regional Completions (2018)
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	405	449	44	11%	42	$86,603.04	Certificate	75	107
49-2097	Electronic Home Entertainment Equipment Installers and Repairers	1,533	1,380	(153)	(10%)	160	$45,616.33	Certificate	0	0
49-3011	Aircraft Mechanics and Service Technicians	4,314	4,556	242	6%	391	$64,352.24	Certificate	0	133
49-3023	Automotive Service Technicians and Mechanics	11,618	12,952	1,334	11%	1,329	$39,494.98	Certificate	73	1,260
49-3052	Motorcycle Mechanics	35	41	6	17%	5	$23,268.48	Certificate	0	566
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	7,525	9,357	1,832	24%	1,014	$43,236.94	Certificate	0	304
49-9062	Medical Equipment Repairers	719	758	39	5%	82	$40,311.56	Associate's	0	6
49-9081	Wind Turbine Service Technicians	76	119	43	57%	15	$49,529.34	Certificate	0	97
49-9092	Commercial Divers	22	27	5	23%	3	$48,907.34	Certificate	0	0
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	217	275	58	27%	31	$56,154.10	Certificate	10	487
51-4111	Tool and Die Makers	494	503	9	2%	51	$52,220.68	Certificate	0	0
51-5111	Prepress Technicians and Workers	171	166	(5)	(3%)	21	$42,810.00	Certificate	13	145
53-2021	Air Traffic Controllers	432	462	30	7%	45	$102,672.99	Associate's	0	12
53-3032	Heavy and Tractor-Trailer Truck Drivers	21,973	24,814	2,841	13%	2,967	$43,022.27	Certificate	0	789
53-5021	Captains, Mates, and Pilots of Water Vessels	483	506	23	5%	49	$76,183.09	Certificate	0	0
53-5022	Motorboat Operators	43	47	4	9%	5	$45,574.76	Certificate	0	0
53-5031	Ship Engineers	49	54	5	10%	7	$65,537.69	Certificate	0	0

Source: Emsi Q2 2020 Data Set May 2020

TABLE 6.10 | ALL OCCUPATIONS IN MARICOPA COUNTY REQUIRING A CERTIFICATE OR ASSOCIATE'S DEGREE | SCOTTSDALE

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Scottsdale Community College Completions (2018)	Regional Completions (2018)
11-9061	Funeral Service Managers	89	100	11	12%	8	$75,209.76	Associate's	0	33
13-1032	Insurance Appraisers, Auto Damage	818	895	77	9%	81	$58,653.08	Certificate	0	31
15-1134	Web Developers	2,824	3,383	559	20%	293	$60,171.49	Associate's	54	5,664
15-1152	Computer Network Support Specialists	5,097	5,704	607	12%	505	$53,893.44	Associate's	18	3,095
17-3011	Architectural and Civil Drafters	1,715	1,825	110	6%	194	$59,439.82	Associate's	11	94
17-3012	Electrical and Electronics Drafters	606	654	48	8%	70	$63,596.43	Associate's	0	44
17-3013	Mechanical Drafters	851	857	6	1%	90	$60,160.96	Associate's	0	45
17-3019	Drafters, All Other	295	315	20	7%	34	$52,568.51	Associate's	0	46
17-3021	Aerospace Engineering and Operations Technicians	738	768	30	4%	76	$66,250.81	Associate's	0	0
17-3022	Civil Engineering Technicians	791	871	80	10%	89	$56,470.51	Associate's	0	0
17-3023	Electrical and Electronics Engineering Technicians	2,414	2,385	(29)	(1%)	235	$62,989.50	Associate's	0	127
17-3024	Electro-Mechanical Technicians	322	324	2	1%	32	$50,282.83	Associate's	0	352
17-3025	Environmental Engineering Technicians	218	250	32	15%	26	$46,265.59	Associate's	0	0
17-3026	Industrial Engineering Technicians	2,129	2,101	(28)	(1%)	209	$58,049.39	Associate's	0	80
17-3027	Mechanical Engineering Technicians	700	718	18	3%	71	$57,813.10	Associate's	0	3
17-3029	Engineering Technicians, Except Drafters, All Other	1,674	1,731	57	3%	172	$55,855.50	Associate's	0	197
19-4011	Agricultural and Food Science Technicians	243	270	27	11%	34	$35,757.38	Associate's	0	0
19-4031	Chemical Technicians	605	681	76	13%	72	$42,147.65	Associate's	0	0
19-4041	Geological and Petroleum Technicians	274	295	21	8%	31	$47,725.52	Associate's	0	0
19-4051	Nuclear Technicians	34	35	1	3%	4	$117,827.24	Associate's	0	1
19-4091	Environmental Science and Protection Technicians, Including Health	507	572	65	13%	71	$40,235.14	Associate's	0	510
19-4093	Forest and Conservation Technicians	120	134	14	12%	17	$37,936.78	Associate's	0	3
19-4099	Life, Physical, and Social Science Technicians, All Other	829	942	113	14%	117	$45,164.84	Associate's	0	105

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Scottsdale Community College Completions (2018)	Regional Completions (2018)
23-2011	Paralegals and Legal Assistants	6,017	6,988	971	16%	786	$48,199.56	Associate's	3	500
23-2091	Court Reporters	112	136	24	21%	14	$58,138.81	Certificate	0	206
23-2099	Legal Support Workers, All Other	553	602	49	9%	56	$54,297.60	Associate's	3	294
25-2011	Preschool Teachers, Except Special Education	5,502	6,424	922	17%	690	$27,458.03	Associate's	0	1,311
25-4031	Library Technicians	975	1,026	51	5%	159	$30,741.64	Certificate	0	0
27-4011	Audio and Video Equipment Technicians	1,505	1,732	227	15%	196	$42,254.96	Certificate	17	435
27-4012	Broadcast Technicians	339	361	22	6%	40	$29,657.52	Associate's	3	4
27-4014	Sound Engineering Technicians	141	162	21	15%	18	$40,125.52	Certificate	17	434
29-1124	Radiation Therapists	262	317	55	21%	19	$85,027.87	Associate's	0	0
29-1126	Respiratory Therapists	1,938	2,460	522	27%	169	$58,955.14	Associate's	0	81
29-2021	Dental Hygienists	2,481	3,113	632	25%	251	$91,543.97	Associate's	0	114
29-2031	Cardiovascular Technologists and Technicians	670	820	150	22%	56	$49,058.77	Associate's	0	25
29-2032	Diagnostic Medical Sonographers	1,629	2,063	434	27%	145	$88,655.29	Associate's	0	32
29-2033	Nuclear Medicine Technologists	224	277	53	24%	19	$86,266.24	Associate's	0	15
29-2034	Radiologic Technologists	2,675	3,331	656	25%	231	$66,838.84	Associate's	0	95
29-2035	Magnetic Resonance Imaging Technologists	664	834	170	26%	58	$84,534.95	Associate's	0	95
29-2041	Emergency Medical Technicians and Paramedics	2,157	2,445	288	13%	181	$36,779.19	Certificate	0	969
29-2051	Dietetic Technicians	1,151	1,290	139	12%	113	$28,180.74	Associate's	0	306
29-2053	Psychiatric Technicians	2,158	2,499	341	16%	223	$34,523.20	Certificate	0	13
29-2054	Respiratory Therapy Technicians	285	176	(109)	(38%)	19	$60,279.40	Associate's	0	105
29-2055	Surgical Technologists	1,819	2,191	372	20%	200	$52,190.36	Certificate	0	121
29-2056	Veterinary Technologists and Technicians	1,087	1,487	400	37%	145	$34,963.93	Associate's	0	427
29-2057	Ophthalmic Medical Technicians	247	393	146	59%	41	$38,228.25	Certificate	0	18
29-2061	Licensed Practical and Licensed Vocational Nurses	5,513	7,434	1,921	35%	683	$55,934.87	Certificate	0	196
29-2071	Medical Records and Health Information Technicians	4,843	5,744	901	19%	430	$37,482.12	Certificate	0	1,412
29-2099	Health Technologists and Technicians, All Other	2,268	2,924	656	29%	242	$43,927.39	Certificate	0	44

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Scottsdale Community College Completions (2018)	Regional Completions (2018)
29-9099	Healthcare Practitioners and Technical Workers, All Other	531	648	117	22%	45	$37,976.81	Certificate	0	1
31-1014	Nursing Assistants	10,671	13,906	3,235	30%	1,699	$31,184.15	Certificate	0	542
31-2011	Occupational Therapy Assistants	989	1,281	292	30%	152	$63,688.29	Associate's	0	25
31-2021	Physical Therapist Assistants	1,866	2,337	471	25%	308	$48,250.40	Associate's	0	99
31-9011	Massage Therapists	3,389	4,164	775	23%	516	$36,984.80	Certificate	0	441
31-9091	Dental Assistants	5,163	6,290	1,127	22%	755	$44,093.54	Certificate	0	415
31-9092	Medical Assistants	14,217	18,433	4,216	30%	2,216	$33,777.64	Certificate	0	2,497
31-9094	Medical Transcriptionists	527	684	157	30%	100	$33,876.24	Certificate	0	0
31-9097	Phlebotomists	1,043	1,834	791	76%	230	$31,255.56	Certificate	0	357
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	1,110	1,225	115	10%	85	$79,055.37	Certificate	0	1
33-2011	Firefighters	3,060	3,460	400	13%	262	$53,773.86	Certificate	0	195
33-2021	Fire Inspectors and Investigators	136	154	18	13%	15	$71,940.24	Certificate	0	195
35-2013	Cooks, Private Household	17	20	3	18%	3	$39,410.53	Certificate	43	176
39-4011	Embalmers	62	67	5	8%	11	$48,084.35	Associate's	0	33
39-4031	Morticians, Undertakers, and Funeral Directors	115	138	23	20%	18	$38,599.79	Associate's	0	33
39-5011	Barbers	1,064	1,369	305	29%	166	$18,066.86	Certificate	0	41
39-5012	Hairdressers, Hairstylists, and Cosmetologists	12,119	14,009	1,890	16%	1,826	$24,638.36	Certificate	0	772
39-5091	Makeup Artists, Theatrical and Performance	15	23	8	53%	3	$56,132.98	Certificate	0	760
39-5092	Manicurists and Pedicurists	2,273	2,786	513	23%	340	$23,721.47	Certificate	0	778
39-5094	Skincare Specialists	1,791	2,061	270	15%	247	$31,145.56	Certificate	0	1,465
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	1,820	1,914	94	5%	221	$40,788.14	Associate's	0	15
43-9031	Desktop Publishers	129	121	(8)	(6%)	15	$33,926.43	Associate's	0	15
49-2021	Radio, Cellular, and Tower Equipment Installers and Repairs	428	453	25	6%	51	$49,612.86	Associate's	0	0
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	2,569	2,988	419	16%	348	$59,770.10	Certificate	0	0
49-2091	Avionics Technicians	332	362	30	9%	28	$65,981.14	Associate's	0	71

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	Scottsdale Community College Completions (2018)	Regional Completions (2018)
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	62	73	11	18%	7	$48,903.17	Certificate	0	1,260
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	596	648	52	9%	60	$63,264.27	Certificate	0	20
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	405	449	44	11%	42	$86,603.04	Certificate	0	107
49-2097	Electronic Home Entertainment Equipment Installers and Repairers	1,533	1,380	(153)	(10%)	160	$45,616.33	Certificate	0	0
49-3011	Aircraft Mechanics and Service Technicians	4,314	4,556	242	6%	391	$64,352.24	Certificate	0	133
49-3023	Automotive Service Technicians and Mechanics	11,618	12,952	1,334	11%	1,329	$39,494.98	Certificate	0	1,260
49-3052	Motorcycle Mechanics	35	41	6	17%	5	$23,268.48	Certificate	0	566
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	7,525	9,357	1,832	24%	1,014	$43,236.94	Certificate	0	304
49-9062	Medical Equipment Repairers	719	758	39	5%	82	$40,311.56	Associate's	0	6
49-9081	Wind Turbine Service Technicians	76	119	43	57%	15	$49,529.34	Certificate	0	97
49-9092	Commercial Divers	22	27	5	23%	3	$48,907.34	Certificate	0	0
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	217	275	58	27%	31	$56,154.10	Certificate	2	487
51-4111	Tool and Die Makers	494	503	9	2%	51	$52,220.68	Certificate	0	0
51-5111	Prepress Technicians and Workers	171	166	(5)	(3%)	21	$42,810.00	Certificate	0	145
53-2021	Air Traffic Controllers	432	462	30	7%	45	$102,672.99	Associate's	0	12
53-3032	Heavy and Tractor-Trailer Truck Drivers	21,973	24,814	2,841	13%	2,967	$43,022.27	Certificate	0	789
53-5021	Captains, Mates, and Pilots of Water Vessels	483	506	23	5%	49	$76,183.09	Certificate	0	0
53-5022	Motorboat Operators	43	47	4	9%	5	$45,574.76	Certificate	0	0
53-5031	Ship Engineers	49	54	5	10%	7	$65,537.69	Certificate	0	0

Source: Emsi Q2 2020 Data Set May 2020

TABLE 6.11 | ALL OCCUPATIONS IN MARICOPA COUNTY REQUIRING A CERTIFICATE OR ASSOCIATE'S DEGREE | SOUTH MOUNTAIN

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	South Mountain Community College Completions (2018)	Regional Completions (2018)
11-9061	Funeral Service Managers	89	100	11	12%	8	$75,209.76	Associate's	0	33
13-1032	Insurance Appraisers, Auto Damage	818	895	77	9%	81	$58,653.08	Certificate	0	31
15-1134	Web Developers	2,824	3,383	559	20%	293	$60,171.49	Associate's	70	5,664
15-1152	Computer Network Support Specialists	5,097	5,704	607	12%	505	$53,893.44	Associate's	53	3,095
17-3011	Architectural and Civil Drafters	1,715	1,825	110	6%	194	$59,439.82	Associate's	0	94
17-3012	Electrical and Electronics Drafters	606	654	48	8%	70	$63,596.43	Associate's	0	44
17-3013	Mechanical Drafters	851	857	6	1%	90	$60,160.96	Associate's	0	45
17-3019	Drafters, All Other	295	315	20	7%	34	$52,568.51	Associate's	0	46
17-3021	Aerospace Engineering and Operations Technicians	738	768	30	4%	76	$66,250.81	Associate's	0	0
17-3022	Civil Engineering Technicians	791	871	80	10%	89	$56,470.51	Associate's	0	0
17-3023	Electrical and Electronics Engineering Technicians	2,414	2,385	(29)	(1%)	235	$62,989.50	Associate's	1	127
17-3024	Electro-Mechanical Technicians	322	324	2	1%	32	$50,282.83	Associate's	0	352
17-3025	Environmental Engineering Technicians	218	250	32	15%	26	$46,265.59	Associate's	0	0
17-3026	Industrial Engineering Technicians	2,129	2,101	(28)	(1%)	209	$58,049.39	Associate's	0	80
17-3027	Mechanical Engineering Technicians	700	718	18	3%	71	$57,813.10	Associate's	0	3
17-3029	Engineering Technicians, Except Drafters, All Other	1,674	1,731	57	3%	172	$55,855.50	Associate's	0	197
19-4011	Agricultural and Food Science Technicians	243	270	27	11%	34	$35,757.38	Associate's	0	0
19-4031	Chemical Technicians	605	681	76	13%	72	$42,147.65	Associate's	0	0
19-4041	Geological and Petroleum Technicians	274	295	21	8%	31	$47,725.52	Associate's	0	0
19-4051	Nuclear Technicians	34	35	1	3%	4	$117,827.24	Associate's	0	1
19-4091	Environmental Science and Protection Technicians, Including Health	507	572	65	13%	71	$40,235.14	Associate's	3	510
19-4093	Forest and Conservation Technicians	120	134	14	12%	17	$37,936.78	Associate's	0	3

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	South Mountain Community College Completions (2018)	Regional Completions (2018)
19-4099	Life, Physical, and Social Science Technicians, All Other	829	942	113	14%	117	$45,164.84	Associate's	0	105
23-2011	Paralegals and Legal Assistants	6,017	6,988	971	16%	786	$48,199.56	Associate's	0	500
23-2091	Court Reporters	112	136	24	21%	14	$58,138.81	Certificate	0	206
23-2099	Legal Support Workers, All Other	553	602	49	9%	56	$54,297.60	Associate's	0	294
25-2011	Preschool Teachers, Except Special Education	5,502	6,424	922	17%	690	$27,458.03	Associate's	2	1,311
25-4031	Library Technicians	975	1,026	51	5%	159	$30,741.64	Certificate	0	0
27-4011	Audio and Video Equipment Technicians	1,505	1,732	227	15%	196	$42,254.96	Certificate	0	435
27-4012	Broadcast Technicians	339	361	22	6%	40	$29,657.52	Associate's	0	4
27-4014	Sound Engineering Technicians	141	162	21	15%	18	$40,125.52	Certificate	0	434
29-1124	Radiation Therapists	262	317	55	21%	19	$85,027.87	Associate's	0	0
29-1126	Respiratory Therapists	1,938	2,460	522	27%	169	$58,955.14	Associate's	0	81
29-2021	Dental Hygienists	2,481	3,113	632	25%	251	$91,543.97	Associate's	0	114
29-2031	Cardiovascular Technologists and Technicians	670	820	150	22%	56	$49,058.77	Associate's	0	25
29-2032	Diagnostic Medical Sonographers	1,629	2,063	434	27%	145	$88,655.29	Associate's	0	32
29-2033	Nuclear Medicine Technologists	224	277	53	24%	19	$86,266.24	Associate's	0	15
29-2034	Radiologic Technologists	2,675	3,331	656	25%	231	$66,838.84	Associate's	0	95
29-2035	Magnetic Resonance Imaging Technologists	664	834	170	26%	58	$84,534.95	Associate's	0	95
29-2041	Emergency Medical Technicians and Paramedics	2,157	2,445	288	13%	181	$36,779.19	Certificate	0	969
29-2051	Dietetic Technicians	1,151	1,290	139	12%	113	$28,180.74	Associate's	0	306
29-2053	Psychiatric Technicians	2,158	2,499	341	16%	223	$34,523.20	Certificate	0	13
29-2054	Respiratory Therapy Technicians	285	176	(109)	(38%)	19	$60,279.40	Associate's	0	105
29-2055	Surgical Technologists	1,819	2,191	372	20%	200	$52,190.36	Certificate	0	121
29-2056	Veterinary Technologists and Technicians	1,087	1,487	400	37%	145	$34,963.93	Associate's	0	427
29-2057	Ophthalmic Medical Technicians	247	393	146	59%	41	$38,228.25	Certificate	0	18
29-2061	Licensed Practical and Licensed Vocational Nurses	5,513	7,434	1,921	35%	683	$55,934.87	Certificate	0	196
29-2071	Medical Records and Health Information Technicians	4,843	5,744	901	19%	430	$37,482.12	Certificate	0	1,412

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	South Mountain Community College Completions (2018)	Regional Completions (2018)
29-2099	Health Technologists and Technicians, All Other	2,268	2,924	656	29%	242	$43,927.39	Certificate	0	44
29-9099	Healthcare Practitioners and Technical Workers, All Other	531	648	117	22%	45	$37,976.81	Certificate	0	1
31-1014	Nursing Assistants	10,671	13,906	3,235	30%	1,699	$31,184.15	Certificate	0	542
31-2011	Occupational Therapy Assistants	989	1,281	292	30%	152	$63,688.29	Associate's	0	25
31-2021	Physical Therapist Assistants	1,866	2,337	471	25%	308	$48,250.40	Associate's	0	99
31-9011	Massage Therapists	3,389	4,164	775	23%	516	$36,984.80	Certificate	0	441
31-9091	Dental Assistants	5,163	6,290	1,127	22%	755	$44,093.54	Certificate	0	415
31-9092	Medical Assistants	14,217	18,433	4,216	30%	2,216	$33,777.64	Certificate	0	2,497
31-9094	Medical Transcriptionists	527	684	157	30%	100	$33,876.24	Certificate	0	0
31-9097	Phlebotomists	1,043	1,834	791	76%	230	$31,255.56	Certificate	0	357
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	1,110	1,225	115	10%	85	$79,055.37	Certificate	0	1
33-2011	Firefighters	3,060	3,460	400	13%	262	$53,773.86	Certificate	0	195
33-2021	Fire Inspectors and Investigators	136	154	18	13%	15	$71,940.24	Certificate	0	195
35-2013	Cooks, Private Household	17	20	3	18%	3	$39,410.53	Certificate	0	176
39-4011	Embalmers	62	67	5	8%	11	$48,084.35	Associate's	0	33
39-4031	Morticians, Undertakers, and Funeral Directors	115	138	23	20%	18	$38,599.79	Associate's	0	33
39-5011	Barbers	1,064	1,369	305	29%	166	$18,066.86	Certificate	0	41
39-5012	Hairdressers, Hairstylists, and Cosmetologists	12,119	14,009	1,890	16%	1,826	$24,638.36	Certificate	0	772
39-5091	Makeup Artists, Theatrical and Performance	15	23	8	53%	3	$56,132.98	Certificate	0	760
39-5092	Manicurists and Pedicurists	2,273	2,786	513	23%	340	$23,721.47	Certificate	0	778
39-5094	Skincare Specialists	1,791	2,061	270	15%	247	$31,145.56	Certificate	0	1,465
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	1,820	1,914	94	5%	221	$40,788.14	Associate's	0	15
43-9031	Desktop Publishers	129	121	(8)	(6%)	15	$33,926.43	Associate's	4	15
49-2021	Radio, Cellular, and Tower Equipment Installers and Repairs	428	453	25	6%	51	$49,612.86	Associate's	0	0

SOC	Description	2020 Jobs	2030 Jobs	2020 - 2030 Change	2020 - 2030 % Change	Annual Openings	Median Annual Earnings	Typical Entry Level Education	South Mountain Community College Completions (2018)	Regional Completions (2018)
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	2,569	2,988	419	16%	348	$59,770.10	Certificate	0	0
49-2091	Avionics Technicians	332	362	30	9%	28	$65,981.14	Associate's	0	71
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	62	73	11	18%	7	$48,903.17	Certificate	0	1,260
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	596	648	52	9%	60	$63,264.27	Certificate	0	20
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	405	449	44	11%	42	$86,603.04	Certificate	0	107
49-2097	Electronic Home Entertainment Equipment Installers and Repairers	1,533	1,380	(153)	(10%)	160	$45,616.33	Certificate	0	0
49-3011	Aircraft Mechanics and Service Technicians	4,314	4,556	242	6%	391	$64,352.24	Certificate	0	133
49-3023	Automotive Service Technicians and Mechanics	11,618	12,952	1,334	11%	1,329	$39,494.98	Certificate	0	1,260
49-3052	Motorcycle Mechanics	35	41	6	17%	5	$23,268.48	Certificate	0	566
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	7,525	9,357	1,832	24%	1,014	$43,236.94	Certificate	0	304
49-9062	Medical Equipment Repairers	719	758	39	5%	82	$40,311.56	Associate's	0	6
49-9081	Wind Turbine Service Technicians	76	119	43	57%	15	$49,529.34	Certificate	0	97
49-9092	Commercial Divers	22	27	5	23%	3	$48,907.34	Certificate	0	0
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	217	275	58	27%	31	$56,154.10	Certificate	0	487
51-4111	Tool and Die Makers	494	503	9	2%	51	$52,220.68	Certificate	0	0
51-5111	Prepress Technicians and Workers	171	166	(5)	(3%)	21	$42,810.00	Certificate	4	145
53-2021	Air Traffic Controllers	432	462	30	7%	45	$102,672.99	Associate's	0	12
53-3032	Heavy and Tractor-Trailer Truck Drivers	21,973	24,814	2,841	13%	2,967	$43,022.27	Certificate	0	789
53-5021	Captains, Mates, and Pilots of Water Vessels	483	506	23	5%	49	$76,183.09	Certificate	0	0
53-5022	Motorboat Operators	43	47	4	9%	5	$45,574.76	Certificate	0	0
53-5031	Ship Engineers	49	54	5	10%	7	$65,537.69	Certificate	0	0

Source: Emsi Q2 2020 Data Set May 2020

CHAPTER 7 TECHNOLOGY TRENDS

FOCUS AREA:

Every year the impact of technology is felt across all levels of the education environment. This is especially true in higher education. Today, every student that enters higher education has been using the "latest" technology since they entered pre-school. Because of this constant escalation of the use of technology in our daily lives and the workplace, now more than ever, it is imperative for higher education to continually evaluate and ultimately implement technology at the institutional and classroom level to enhance students' learning experiences. This chapter of the environmental scan will provide a high-level overview of some of the current technology trends that are impacting curriculum and instruction at higher education institutions. To gain better insight into economic conditions and workforce trends in Maricopa County, the information and data shared in this chapter will provide each college a way to examine occupational demand in relation to its current program offerings and program completions. The goal of the analysis is to provide MCCCD and each college with relevant data and information that it can use when making decisions about current and future program development and how that needs to be reflected in the facility master planning process.

QUESTIONS FOR THIS FOCUS AREA:

- How will technology overall change the student experience over the next 4-5 years either when they are on campus or through virtual learning?
- What changes need to be contemplated for programs and curriculum based on anticipated advances in technology?

DATA ANALYTICS AND VISUALIZATION

Data visualization is the presentation of data in a pictorial or graphical format. It enables decision makers to see analytics presented visually to grasp difficult concepts or identify new patterns. With interactive visualization, you can take the idea a step further by using technology to drill down into charts and graphs for more detail, interactively changing what data you see and how it's processed.

The concept of using pictures to understand data has been around for centuries, from 17th-century maps and graphs to pie charts in the early 1800s. Technology, however, has drastically accelerated data visualization. Computers made it possible to process large amounts of data at lightning-fast speeds. Today, data visualization has become a rapidly evolving blend of science and art that is certain to change the corporate landscape over the next few years. Regardless of industry or size, all types of businesses use data visualization to help make sense of their data.

Data analytics and visualization will impact higher education in two ways. First, it will change the way colleges collect, analyze, and share information, both internally and externally. Second, data analytics and visualization will most likely become a core element of most program curricula as businesses and employers require their employees to be proficient in using data and interpreting data.

IMMERSIVE LEARNING

Augmented reality (AR) and virtual reality (VR) have been growing in use over the last 3-5 years. Several experts believe that by 2022, 70% of organizations will experiment with immersive technology. Not long ago, AR and VR were only a fantasy to professors and their students – technologies in a far-off world that would never be used in their classroom. Today, the use of AR and VR will be picking up heavily, particularly for classrooms and exercises that are based on tasks and skills. The equipment prices are much more financially accessible to more institutions than they were even a few years ago.

AR and VR help collegiate students genuinely enjoy learning. The immersive learning technologies stand out from traditional classroom methods by overcoming language barriers and accommodating visual learners. They also focus on practical approaches instead of just theory, which learners can often forget. The use of AR and VR enables students to experience concepts. Experiences stick with us more than trying to memorize a textbook definition. They add another dimension to e-learning and empower organizations to incorporate environments that would be too costly to recreate in the real world. Training in a virtual environment increases levels of workplace safety as well.

ADAPTIVE LEARNING

Like immersive learning, adaptive learning is another methodology that's reshaping higher education. As used in this context, adaptive learning can provide students with their own personalized course, made specifically for their strengths, weaknesses, goals, and engagement patterns is nearly a perfect world for them. Adaptive learning uses artificial intelligence (AI) to adjust content to each individual's needs, so it's not a one-size-fits-all model of learning.

AI machine learning will continue to get smarter. When reading students, it will better differentiate real activities from junk as a natural progression of the technology evolution curve. AI and machine learning get more sophisticated every month through the continual increase of computing power and the ability to process data in a way that we never could before.

While adaptive learning and AI are beneficial to students, their advances have typically generated a great deal of conversation regarding ethical concerns. These controversies of AI being too smart for our own good need to be discussed—especially for the protection of students. For this reason, the pursuit of the responsible use of technology needs to remain a priority.

AUTOMATION AND ARTIFICIAL INTELLIGENCE

Artificial Intelligence (AI) is transforming many human activities ranging from daily chores to highly sophisticated tasks. But unlike many other industries, the higher education sector has yet to be influenced by AI. Uber has disrupted the taxi sector, Airbnb has disrupted the hotel industry, and Amazon has disrupted the whole retail industry. It is only a matter of time then until the higher education sector undergoes a significant transformation. Within a few short years, it seems likely that higher education will have changed beyond all recognition.

PERSONALIZED LEARNING

Many higher education segments are already using AI algorithms to personalize learning and deliver content that is suited to the students' needs and pace of learning, which is only likely to continue. This idea is built on research that shows different people have different aptitudes, skills, and orientations to learning when exposed to the same content and learning environments. This will be a significant change for higher education, as it moves away from the traditional model of "one-size-fits-all." Educators will be equipped with data sets to analyze and understand the needs of individuals. This will allow work to be automatically adapted to each specific student's style and pace of learning.

RETHINKING THE CLASSROOM

As educational AI develops, students will be able to study where they want, when they want, and using whatever platform they want. This is likely to mean that tablets and mobile phones will become the main delivery methods. Even though right now, in many higher education classrooms, these devices are banned from use. Higher education in many places is already using AI-enabled smart building concepts to redesign learning spaces. Modern "smart" classroom spaces are now generally equipped with circular tables, laptops, flat-screen monitors, multiple projectors, and whiteboards to encourage and support collaborative and engaged active learning. This helps educators move away from a traditional classroom set-up to a more interactive teaching and learning style to encourage deeper learning approaches. This evolution will include more hybrid methods of learning, such as face-to-face and online interactions.

CREATING A SMART CAMPUS

The Internet of Things also can transform higher education into smarter places to work and learn. At its core, technology is all about connecting devices over the internet and letting them talk to us and each other. Smart classrooms will also enhance the learning experience of the students. A classroom connected to the Internet of Things can adapt to the personalized settings to prepare the classroom for different faculty members. This technology development will also enable smart campuses to adopt advanced systems to monitor and control every facility automatically. Universities will be able to easily monitor parking spaces, building alarms, room usage, heating, and lighting.

BETTER STUDENT EXPERIENCES

Higher education uses AI to streamline their processes, resulting in cost savings and better customer service in their student services arena. A good example of this is one institution of higher education, which has partnered with IBM to be the first college worldwide to implement Watson. Watson is a supercomputer developed by IBM that combines AI and sophisticated analytical software to answer users' questions. Watson's main functionality is to replicate a human's ability to answer questions. This functionality uses 90 servers with a combined data store of more than 200 million pages of information and processed against six million logic rules.

BRING YOUR OWN DEVICE

The concept of having students bring their own devices to a campus or classroom is not necessarily a new concept for most colleges. What has probably changed the most in the last couple of years is that students are not bringing just one device, but they are bringing multiple devices in many instances. With so many devices being brought onto campus, the question becomes can the college's wireless and cellular resources accommodate the demand. Therefore, the college has to invest in cellular and Wi-Fi -coverage, network architecture, and web-based access to services and data to support all of these mobile platforms. Colleges need to be prepared to do more than meet the demand from today's mobile devices. It appears that the next trend in this technology area will "be-your-own-device" trend toward wearable technology.

ACTIVE LEARNING SPACES

The transition to active learning classrooms and spaces in higher education has gained considerable momentum in recent years. Designing and evaluating spaces that facilitate active learning and collaboration require investments and strategic planning to renovate or construct classrooms, libraries, and common spaces where learning takes place. Although efforts often focus on the elements of redesigned learning spaces—such as wireless bandwidth, display screens, flexible furniture, varied writing surfaces, and abundant power—obtaining stakeholder buy-in and transforming pedagogical approaches are equally significant considerations. Faculty, students, instructional designers, IT staff, and facilities personnel are key stakeholders in the redesign of academic spaces. Physical learning space design is considered a short-term trend, yet a commensurate focus on virtual learning spaces may be further out on the horizon. Many online platforms have bundled solutions to facilitate team-based learning and synchronous meeting spaces. Yet, emerging learning spaces programmed in extended reality (XR) can create more engaging and personal experiences for learners than any current developments in online course design.

BLENDED LEARNING DESIGNS

Blended learning designs have steadily increased as a favored course delivery model alongside fully online options. Previously defined by the proportions of face-to-face versus online coursework, blended learning is typified by integrating those digital solutions most applicable for achieving the course's learning outcomes. Media-rich digital learning platforms, personalized or adaptive courseware, and web conferencing tools capable of connecting students for synchronous distance activities are becoming common solutions for blended learning designs. Students report a preference for blended learning, citing flexibility, ease of access, and the integration of sophisticated multimedia. Although blended learning is becoming a common course design, the challenges of scaling this modality persist for some institutions. Supporting faculty to design learning experiences that take full advantage of digital platforms and expand their pedagogical repertoire to include collaboration and student-centered learning design will support the growth of blended learning.

EDUCAUSE ANNUAL SURVEY OF STUDENT TECHNOLOGY USE IN HIGHER EDUCATION

For 15 years, the EDUCAUSE Center for Analysis and Research (ECAR) has researched information technology (IT) and higher education's most important end-users, undergraduate students. The research's overall goal is to understand students' perspectives on how technology impacts their academic experiences and how they use technology to enhance their academic success. For the 2019 report, 53,475 students from 160 institutions in 7 countries and 38 US states participated in the research. The quantitative findings were developed using the 40,596 survey responses from 118 US institutions. This report makes generalized statements about the findings based on a large number of survey respondents. Applying these findings, however, is an institutionally specific undertaking. The priorities, strategic vision, and culture of an institution will inevitably affect the meaning and use of these findings in a specific academic context.

KEY FINDINGS

- Because of the recent shift to online and virtual learning because of the COVID-19 pandemic, many higher education leaders have gotten mixed feedback from students on the quality of their online experience. We can learn from the 2019 EDUCAUSE survey of students that the learning environment they prefer depends on what the student's life is like outside of the classroom. Across all respondents, most students preferred a blending of face-to-face and online learning. However, when responses are analyzed by key demographic factors, the results show that students who are married or in a domestic partnership, those who were independent and had dependents of their own, and students who worked 40 or more hours a week were more likely than their peers to prefer environments that are mostly or completely online.

FIGURE 7.1 | STUDENT LEARNING ENVIRONMENT PREFERENCES, BY KEY STUDENT DEMOGRAPHIC FACTORS

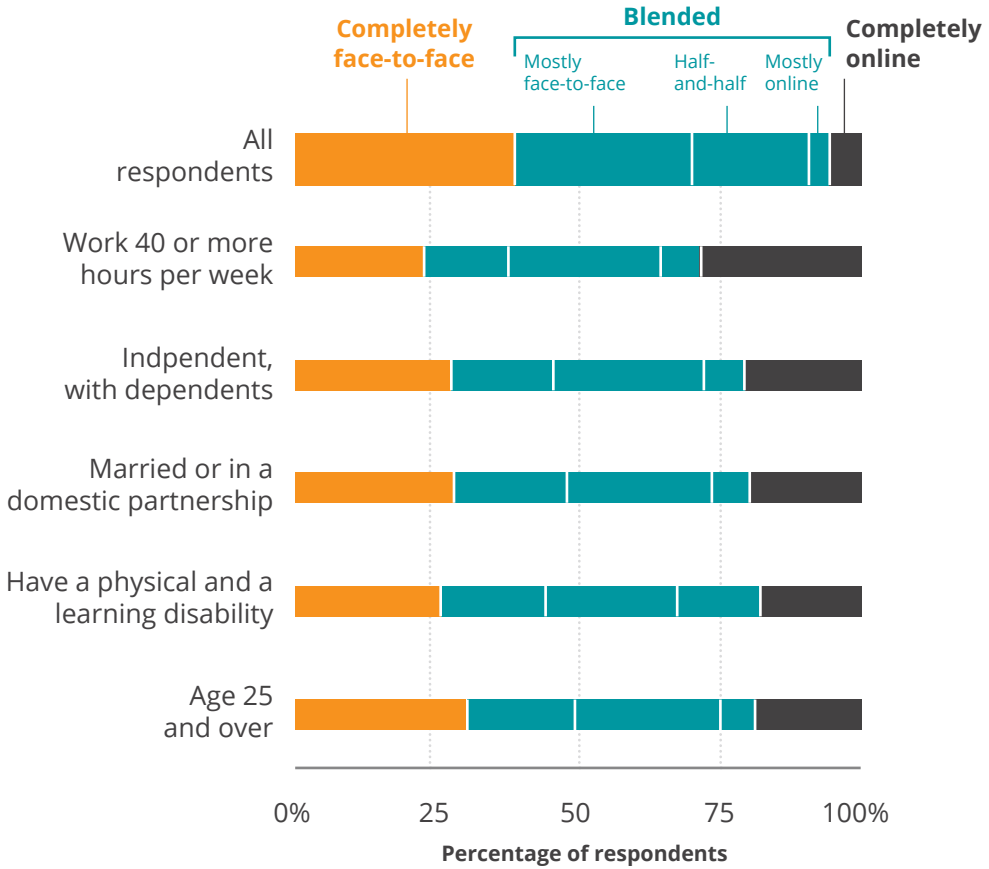
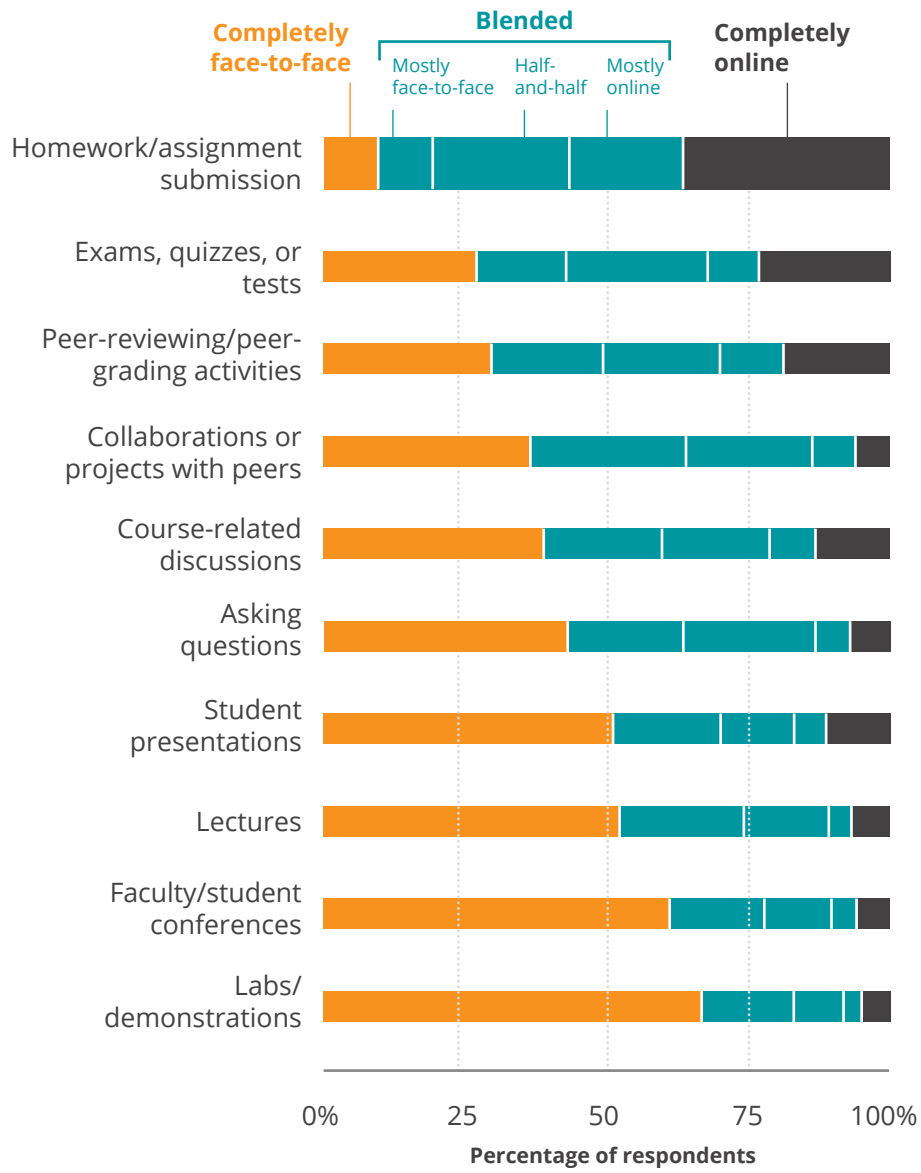


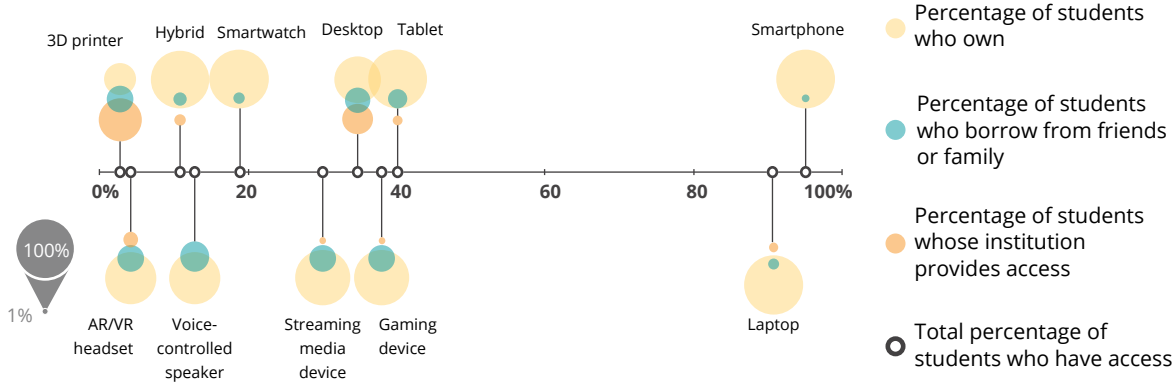
FIGURE 7.2 | STUDENT LEARNING ENVIRONMENT PREFERENCES FOR SPECIFIC COURSE-RELATED ACTIVITIES AND ASSIGNMENTS



- Closely related to the general learning environment students prefer is whether students differ on what learning environment they prefer across different academic activities. Again, students were surveyed and asked, based upon a list of specific course-related activities and assignments, whether or not they preferred a certain learning environment over another. As the results indicate below, students had significantly different preferences for their learning environment depending upon the type of course activity. For example, when it comes to homework and assignment submission, 55% of students preferred mostly online, and another 35% preferred completely online. At the opposite end of the learning environment spectrum, 67% preferred labs and demonstrations in a face-to-face environment. Overall, most students preferred a blended learning environment. These results clearly show a one-size-fits-all learning environment does not exist. Furthermore, instructors need to take a more student-centered approach when choosing the learning environment for a particular learning task to keep students engaged.

- Practically all college and university students have access to the most important technologies for their academic success. US students reported near-universal access to a desktop, laptop, tablet, or smartphone, with no systematic differences in access based on ethnicity, gender, age, and socioeconomic status. However, students reported low levels of access to newer, more expensive technologies such as augmented reality (AR) and virtual reality (VR) headsets and 3D printers.

FIGURE 7.3 | STUDENT DEVICE ACCESS AND OWNERSHIP



- While laptops, hybrids, desktops, and smartphones continue to be rated as very to extremely important to student success, the importance of these devices differs considerably by student demographics. Generally, women, students of color, students with disabilities, first-generation students, independent students (with or without dependents of their own), and students from disadvantaged socioeconomic backgrounds see their devices as significantly more important to their success than do their counterparts. White students are significantly less likely than non-white students to think desktops, tablets, and smartphones are important to their success.

FIGURE 7.4 | STUDENT DEVICE USE AND RATINGS OF IMPORTANCE

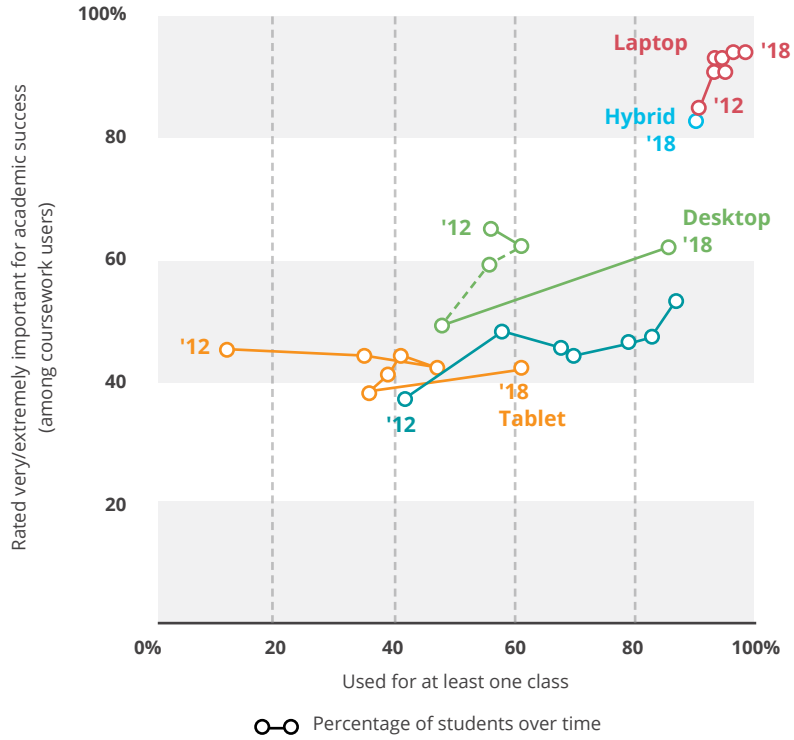
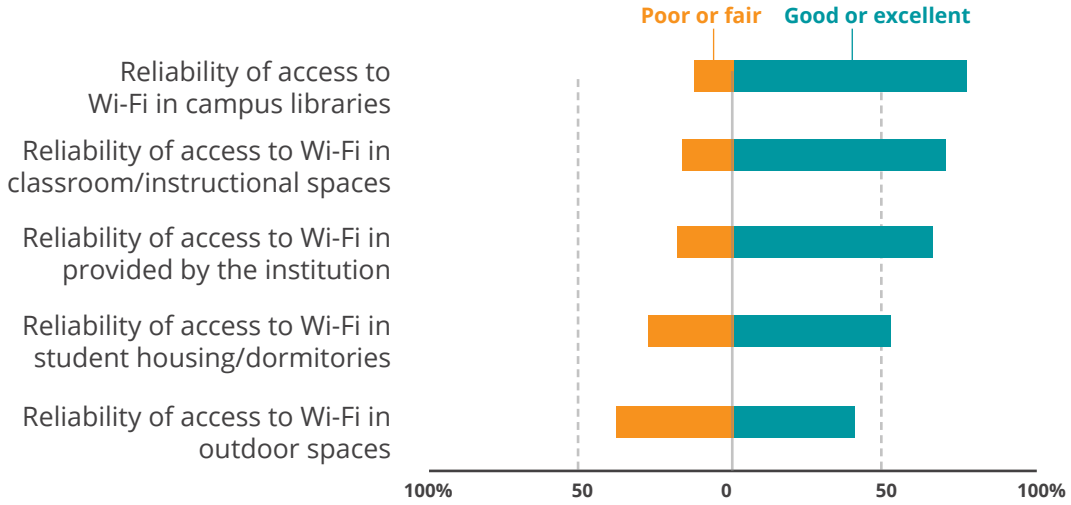
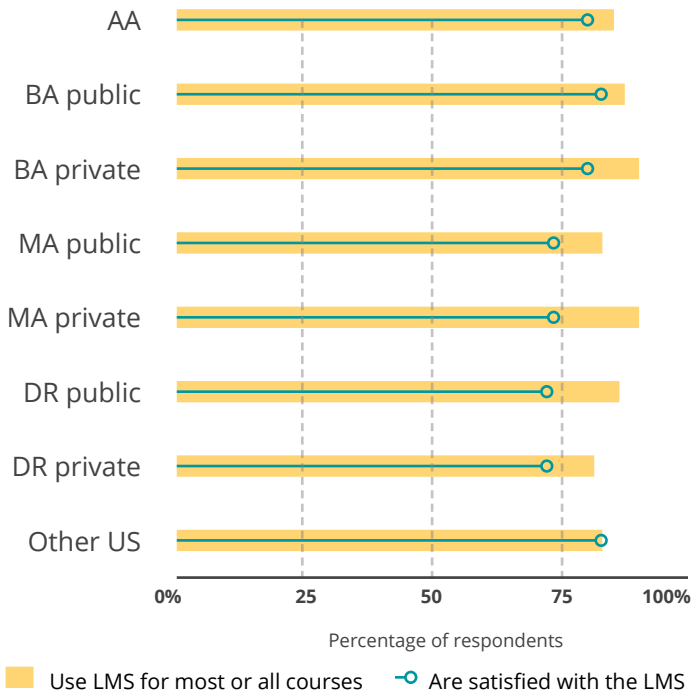


FIGURE 7.5 | STUDENT EXPERIENCES OF WIRELESS NETWORKS



- Students' overall technology experiences continue to be correlated with their evaluation of campus Wi-Fi reliability and ease of login. Students' evaluation of campus Wi-Fi in various locations has remained largely flat in recent years, but significant gaps remain in terms of the quality of connectivity in dormitories/student housing and outdoor spaces, as well as ease of network login.

FIGURE 7.6 | STUDENT LMS USE, BY CARNEGIE CLASS



- LMS use remains prevalent across higher education institutions, with continued high rates of use and student satisfaction. Three-quarters of all students reported being either satisfied or very satisfied with their institution's LMS, and more than three-quarters of students reported their LMS was used for most or all of their courses. This likely reflects satisfaction primarily with the functional aspects of their institution's LMS.

- A majority of students continue to express preferences for learning environments that fall somewhere on the "blended" continuum (from mostly face-to-face to mostly online). While a plurality (38%) of students prefer fully face-to-face classroom environments, students who have taken some fully online courses are significantly more likely to prefer blended environments and less likely to prefer purely face-to-face courses.

FIGURE 7.7 | STUDENT LEARNING ENVIRONMENT PREFERENCES

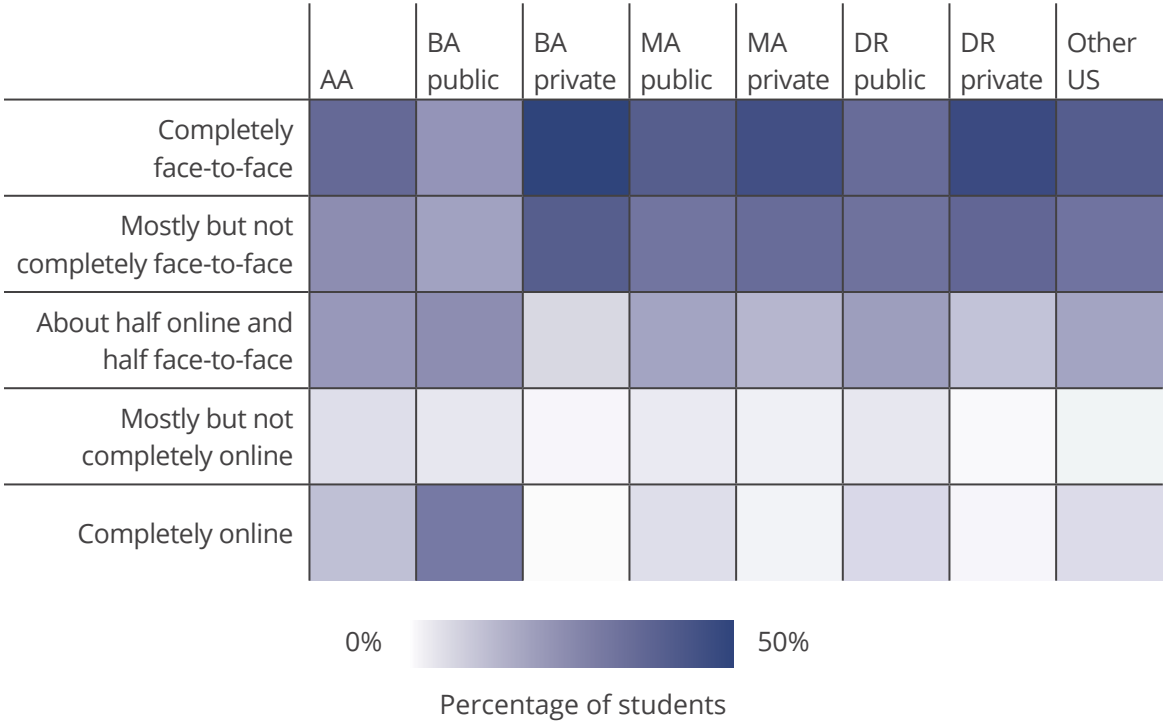
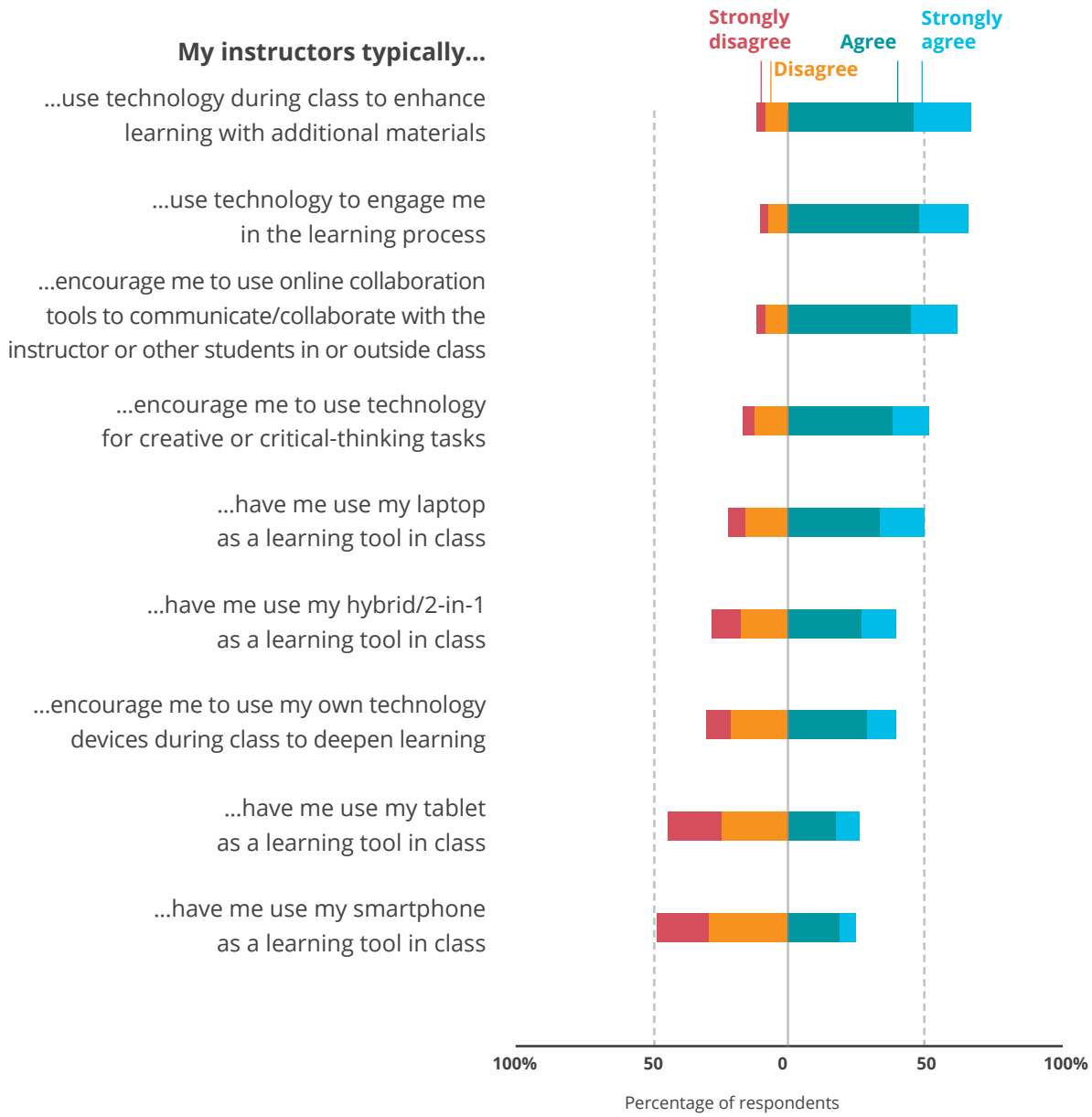


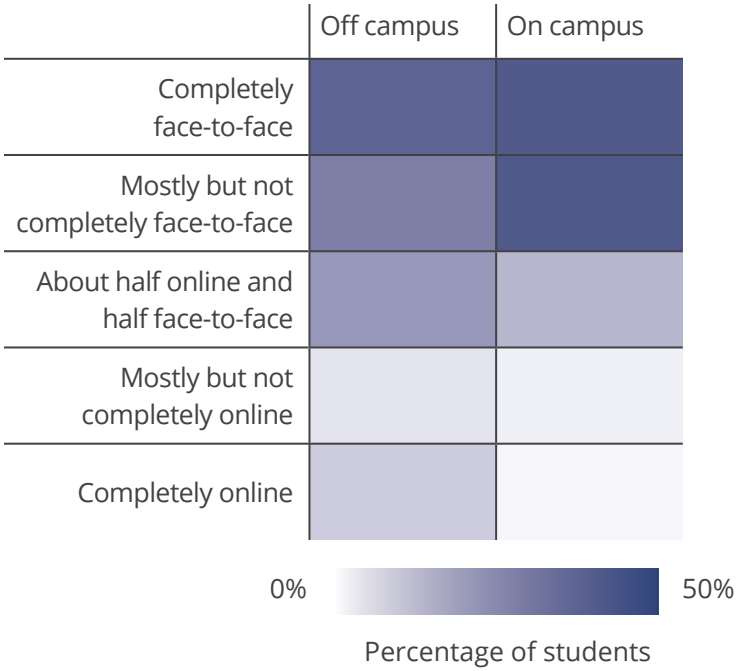
FIGURE 7.8 | STUDENT EXPERIENCES WITH INSTRUCTORS AND TECHNOLOGY



- Although most students said their instructors use technology to enhance their pedagogy, improve communication, and carry out course tasks, there are limitations when it comes to personal device use. Instructors encourage students to use their laptops more than smartphones. Still, nearly a third of students are not encouraged to use their own devices as learning tools in class, suggesting that many students take courses in which faculty discourage or ban the in-class use of students' technology.

- Nearly three-quarters of students (72%) who live off-campus reported their internet connections at their home/off-campus residence are either good or excellent, and only 2% reported having no internet access at home. Students who live off-campus have a stronger preference for online and blended courses than do their on-campus counterparts. This preference may reflect how online learning can benefit those who need to juggle work schedules and family responsibilities.

FIGURE 7.9 | LEARNING ENVIRONMENT PREFERENCES, BY STUDENT LIVING SITUATION



- The typical student is fairly serious about doing the work of being a student, spending 1 to 4 hours per day online doing homework and conducting research. Contrary to popular belief, students do not appear to spend most of their time using social media, watching TV, or playing video games. Indeed, the typical student spends 1 to 2 hours on social media and another 1 to 2 hours streaming video; more than half of students reported that they do not play video games.

FIGURE 7.10 | HOW THE TYPICAL STUDENT SPENDS TIME ONLINE

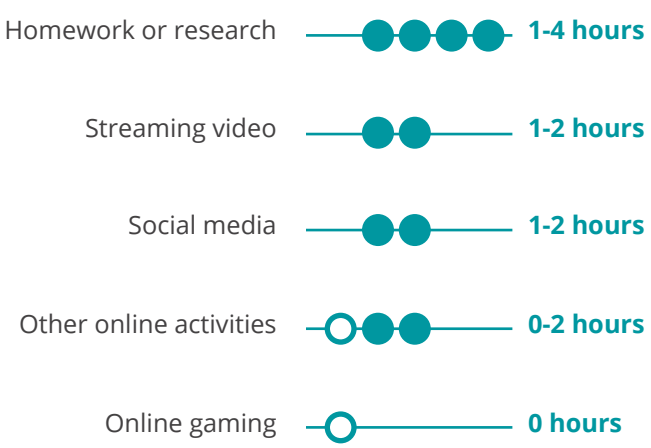
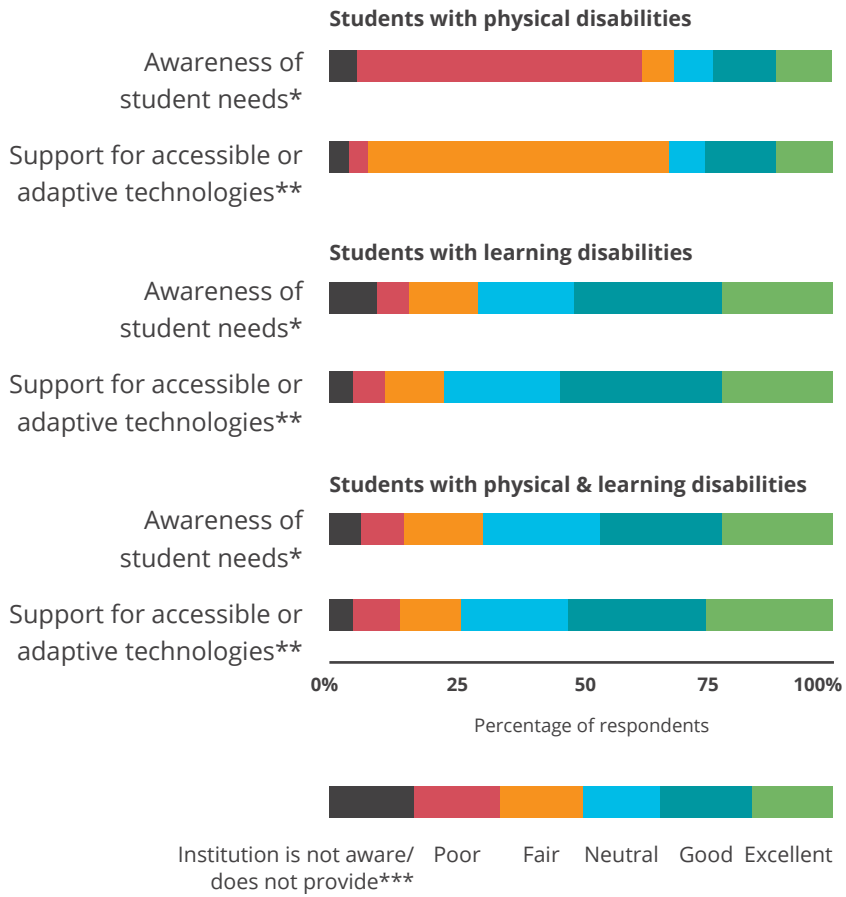


FIGURE 7.11 | INSTITUTIONAL AWARENESS OF STUDENTS' NEEDS FOR ACCESSIBLE OR ADAPTIVE TECHNOLOGIES



* Institution's awareness of student needs for accessible or adaptive technologies needed for coursework

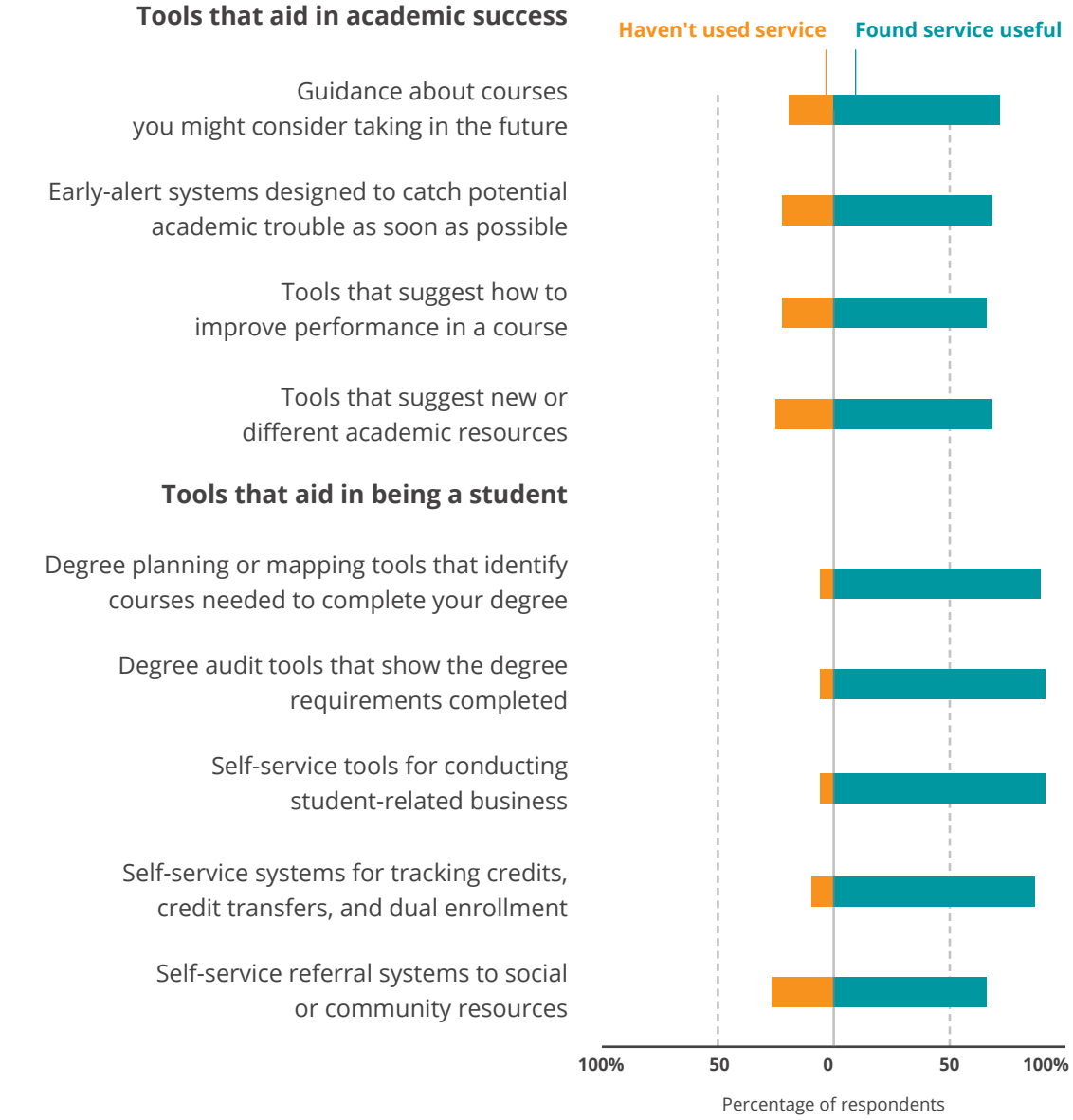
** Institution's support for accessible or adaptive technologies needed for coursework

*** Institution is not aware of needs for accessible or adaptive technologies/Student is not provided with accessible or adaptive technologies needed

- A plurality of students who self-identify as having a physical and/or learning disability requiring accessible or adaptive technologies for their coursework rated their institution's awareness of their needs as poor. According to students, larger and DR public institutions tend to have poorer awareness of disabled students' needs than do smaller and AA institutions. In addition to institutional limitations, students' fears of being stigmatized or penalized for disclosing their disabilities and engaging disability services to receive the aid they need may be contributing to low rates of awareness.

- Students continue to view student success tools as at least moderately useful. Students view success tools that help with transactional tasks related to the work of being students (e.g., conducting business, tracking credits, planning degrees, conducting degree audits) as slightly more useful than those that help them academically (e.g., early-alert systems, academic resources, course recommendations, improvement of academic performance).

FIGURE 7.12 | STUDENT EXPERIENCES WITH INSTRUCTORS AND TECHNOLOGY



SOURCES:

- Data Visualization: What it is and why it matters; February 6, 2019; Retrieved from SAS website; www.sas.com.
- EdTech Digest: Higher Education Trends to Watch in 2019; February 8, 2019; Retrieved from EdTech Website; www.edtechdigest.com.
- The Conversation: Five Ways Artificial Intelligence Will Shape the Future of Universities; February 8, 2019; Retrieved from The Conversation website; www.theconversation.com.
- ¨The Consumerization of Technology and the Bring-Your-Own-Everything (BYOE) Era of Higher Education¨ (EDUCAUSE Center for Analysis and Research, March 2013).
- Galanek, Joseph D., Dana C. Gierdowski, and D. Christopher Brooks. ECAR Study of Undergraduate Students and Information Technology, 2018. Research report. Louisville, CO: ECAR, October 2018.
- Dana C. Gierdowski. ECAR Study of Undergraduate Students and Information Technology, 2019. Research report. Louisville, CO: ECAR, October 2019.
- EDUCAUSE: Horizon Report Preview; 2020 Higher Education Edition; 2020.

CHAPTER 8 POLITICAL TRENDS

FOCUS AREA:

There are no doubt unlimited external pressures that influence the day-to-day operation of a community college. Today, because of the broad mission of a community college and its importance in the economic vitality within the community they serve, more than ever, there are increased political pressures and influence they must navigate to keep the college aligned with the prevailing political winds. This section of the environmental scan will provide a high-level overview of the major political issues and challenges at both the state and local level that typically influence future community college planning.

QUESTIONS FOR THIS FOCUS AREA:

- What impact will/does immigration policies have on enrollments at MCCCD campuses?
- With current and future state aid for community colleges so uncertain, how should campuses help create more consistency in their annual budget cycles?

IMMIGRATION POLICY REFORM

Enacted legislation related to immigration increased in 2019 by 3% to 181 laws, compared with 175 laws in 2018. The number of resolutions decreased by 39% to 135 from 222. Lawmakers in 45 states, the District of Columbia, and Puerto Rico enacted 181 laws and 135 resolutions related to immigration, for a total of 316. Governors vetoed an additional 16 bills.

Alabama, Alaska, Mississippi, West Virginia, and Wisconsin did not enact immigration-related legislation in 2019.

2019 TRENDS

CENSUS

Eight states addressed the 2020 census and immigrant residents. California, Colorado, Massachusetts, Illinois, and Rhode Island enacted laws and resolutions promoting an accurate count of immigrant communities for the forthcoming 2020 census. Colorado and Massachusetts also funded outreach grant programs for hard-to-count communities, including immigrants. Montana adopted resolutions asking Congress for a citizenship question to be included in the census, while Nevada passed a resolution opposing a citizenship question. Kentucky adopted a resolution opposing illegal immigrants being counted in the census. California made it a misdemeanor to misidentify oneself as a census employee conducting a government census, and Illinois banned census data from being shared with immigration and law enforcement agencies.

OFFICES/TASK FORCES ON IMMIGRATION AND INTEGRATION

Four states—Illinois, Michigan, Nevada, and Vermont—passed legislation to create a task force to provide services and resources to new immigrants. Vermont's law specifically focused on workforce development, while task forces in Michigan, Nevada, and Illinois are charged with reviewing state resources available to new Americans. The Michigan and Illinois task forces will review and report on federal immigration enforcement in their respective states. New Jersey's governor signed Executive Order 74, creating an Interagency Workgroup on New American Integration and requiring Human Services and Labor and Workforce Development departments to improve immigrant and refugee integration, including creating an Office of New Americans.

OCCUPATIONAL LICENSING

Nine states enacted measures to expand licensing and credentialing options for citizens and noncitizens with professional training.

Arkansas authorized the State Board of Nursing to license recipients of the Deferred Action for Childhood Arrivals (DACA) program. It added a medical fellowship as a method for a foreign medical graduate to obtain a license to practice medicine. California, Illinois, and Nevada prohibited denying occupational or professional licenses based solely on the applicant's citizenship or immigration status. Maine repealed a residency provision for applicants and a character reference requirement for foreign-trained applicants. New Jersey established a pilot program for licensing those with a barber's license from another state or foreign country. Oregon required professional licensing boards to study how immigrants or refugees become licensed and reduce barriers. Vermont required the Department of Labor to help employers address the unique language, transportation, cultural and other challenges for new Americans in the workforce. Washington's statewide workgroup will develop strategies with private-sector businesses, labor, and immigrant advocacy organizations. The strategies will support industries, strengthen immigrants' career pathways, provide predictability and stability in the agriculture workforce, and recommend approaches to attract and retain immigrant business owners.

DRIVER'S LICENSES

New Jersey, New York, and Oregon became the most recent states to enact legislation extending driver's licenses and identification cards to those without proof of lawful presence. New Hampshire established a commission to study licensing drivers from foreign countries and make recommendations.

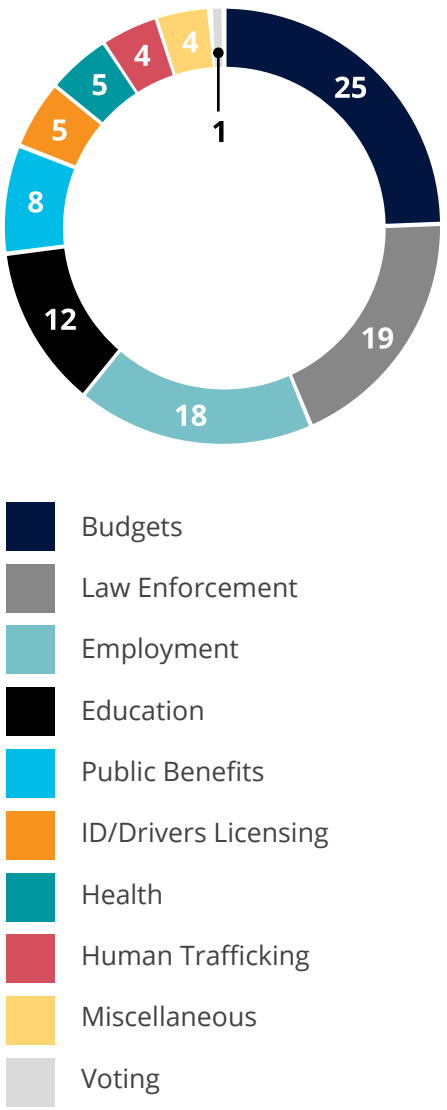
SANCTUARY POLICIES/ IMMIGRATION ENFORCEMENT

While there is no legal definition for sanctuary policies, the term is applied to jurisdictions that limit cooperation with federal immigration authorities. Ten states and the District of Columbia addressed immigration enforcement. Arkansas made municipalities that enact a sanctuary policy ineligible for state discretionary funds, and Florida prohibited the state, localities, or law enforcement agencies from adopting a sanctuary policy. California and the District of Columbia limit state law enforcement agencies from sharing information regarding an individual's citizenship or immigration status for immigration enforcement. Colorado, Connecticut, and the District of Columbia established limits on civil immigration detainers. Illinois prohibits a state law enforcement agency or official from entering into an agreement with U.S. Immigration and Customs Enforcement. Washington requires the attorney general to publish model policies for limiting immigration enforcement, consistent with federal and state law, at public schools, health facilities, courthouses, and shelters. Oregon appropriated $2 million for the Innovation Law Lab to help connect immigrants with legal assistance. Vermont allows additional restrictions on law enforcement agency communication and involvement with federal immigration authorities or communications regarding citizenship or immigration status. Nevada requires those questioning a prisoner in the custody of a county or city jail or detention facility about his or her immigration status to inform the prisoner of the purpose of those questions.

EDUCATION/CIVICS

In 2019, Indiana, Nebraska, and Texas became the latest states to add portions of the federal naturalization exam to high school civics curricula and testing requirements. Arkansas allowed DACA students to be eligible for in-state tuition.

FIGURE 8.1 | 2019 ENACTED LAWS



REQUESTS FOR FEDERAL ACTION

In 2019, 12 states—Arkansas, California, Georgia, Illinois, Kentucky, Montana, North Dakota, New Jersey, Nevada, South Dakota, Texas, and Utah—adopted 22 resolutions seeking congressional or administrative action on immigration. Georgia, Illinois, and Kentucky adopted resolutions urging the enactment of legislation to secure the citizenship of internationally adopted individuals. Five states—Georgia, Kentucky, North Dakota, South Dakota, and Texas—passed resolutions calling for increased funding to secure the U.S.-Mexican border. Arkansas supported President Donald Trump and the Arkansas congressional delegation on the border security issue and urged a long-term funding solution. California and Illinois urged Congress to grant visas to DACA-eligible children. California urged repeal of regulations adopted by the U.S. Department of Homeland Security on public charge, meaning dependent on government assistance.

- 25% of all laws, the largest category, are budget and appropriations laws, authorizing funds for purposes including immigration enforcement, immigrant integration, English literacy classes, and migrant and refugee services.
- Legislation related to law enforcement, such as communicating with federal immigration agencies, complying with immigration detainers, certification for U visas, and providing legal services, accounted for 19%.
- 18% of laws focused on employment, work authorization, and E-Verify, limiting workers' compensation or unemployment insurance. A new trend is legislation addressing occupational licensing and certification for foreign-trained professionals.
- 12% of laws dealt with education, addressing immigration and residency requirements for access to higher education, in-state tuition, or financial assistance at educational institutions. A new trend is legislation to include the federal naturalization exam in high school civics requirements.
- 8% of laws addressed public benefits such as eligibility for social services or assisting those with special immigrant juvenile status.
- Legislation related to I.D.s/driver's licenses and other licenses made up 5% of all enacted laws on immigration.
- 5% of laws related to health, such as eligibility criteria for health care programs, language access or licensing related to health professionals.
- 2% of laws addressed human trafficking, such as penalties for withholding or destroying immigration documents and providing assistance to victims.
- The remainder of this section will provide a high-level overview of the major education policies enacted at the state level for immigration reform. To find the latest information on the other category of laws and policies enacted across the county regarding immigration statutes, visit www.ncsl.org.

2019 SUMMARY OF EDUCATION RELATED IMMIGRATION POLICIES

- This section provides summaries of laws that have been passed in other states. While not all are currently applicable to Arizona, state-level laws are often trendy, and laws passed in one state are often reviewed and then introduced in other states. In some cases, these laws may provide a glimpse into the future for Arizona institutions. Lawmakers in 12 states enacted 22 laws: Arkansas, California, Colorado, Georgia, Illinois, Indiana, Nebraska, New York, Oregon, Pennsylvania, Rhode Island, and Texas.
- These laws usually pertain to immigration and residency requirements for access to higher education, in-state tuition, or financial assistance at educational institutions. Some laws address enhanced learning for refugees or English learners. A recent trend is legislation to include the federal naturalization exam in high school civics requirements.
- **Arkansas HB 1684.** This legislation permits graduates of a state public or private high school who have resided in the state for a certain amount of time to receive in-state tuition and fees at a state-supported higher education institution. Applicants must (1) hold a federal work permit or be the child of someone with a work permit, (2) be an Arkansas resident legally present from the Republic of the Marshall Islands, or (3) be a DACA recipient.
- **California AB 1645.** This legislation requires California Community Colleges and California State University and requests the University of California to designate a "Dreamer" resource liaison on each of their campuses. The liaison will assist students, including undocumented students, in meeting specified requirements by streamlining access to all available financial aid, social services, state funding, legal immigration services, internships, externships, and academic opportunities.
- **Colorado HB 1196.** This legislation allows certain undocumented students who meet the criteria for classification as in-state students for tuition purposes to be eligible for state-funded financial assistance programs offered by the Department of Higher Education.
- **Indiana SB 132.** This law requires each high school to administer the naturalization examination provided by the U.S. Citizenship and Immigration Services as part of the United States government credit.
- **Nebraska LB 399.** This law requires the school social studies curriculum to include a written test identical to the entire civics portion of the naturalization test used by U.S. Citizenship and Immigration Services before completing eighth grade and again before completing 12th grade. The test is one option to demonstrate an understanding of American civics.

- **New York SB 1250.** This law allows an applicant who is not a legal resident of the state but is a U.S. citizen, a permanent lawful resident, a lawful nonimmigrant alien, or an applicant without lawful immigration status to be eligible for in-state tuition. The applicant must have attended a state high school for two years and graduated and applied for college within five years of receiving a high school diploma. A student without lawful immigration status shall also be required to file an affidavit with the higher education institution a filed application to legalize his or her immigration status or file such an application as soon as they are eligible to do so. The law also creates a DREAM commission to raise private funds to assist with higher education costs.
- **Texas HB 1244.** This law requires the civics education graduation test to include ten questions randomly selected from the civics test administered by the U.S. Citizenship and Immigration Services as part of the naturalization process.

TUITION BENEFITS FOR IMMIGRANTS

Sixteen states and the District of Columbia offer in-state tuition to unauthorized immigrant students by state legislative action and five states by state university systems. Sixteen state legislatures—California, Colorado, Connecticut, Florida, Illinois, Kansas, Maryland, Minnesota, Nebraska, New Jersey, New Mexico, New York, Oregon, Texas, Utah and Washington—and the District of Columbia—enacted laws to allow in-state tuition benefits for certain unauthorized immigrant students.

These laws typically require attendance and graduation at state high schools, acceptance at a state college or university, and promising to apply for legal status as soon as eligible. At least five state university systems—the University of Hawaii Board of Regents, University of Maine Board of Trustees, University of Michigan Board of Regents, Oklahoma State Regents for Higher Education, and Rhode Island's Board of Governors for Higher Education—established policies to offer in-state tuition rates to unauthorized immigrant students.

- Delaware has considered but not enacted legislation, but Delaware Technical Community College and the University of Delaware allow undocumented students to be eligible for in-state tuition and financial aid.
- In 2018, Connecticut, Maryland, New Jersey, Oregon, and Washington enacted laws allowing certain immigrant students, such as students with Deferred Action for Childhood Arrivals (DACA), to be eligible for financial aid.
- At least nine states—California, Connecticut, Maryland, Minnesota, New Jersey, New Mexico, Oregon, Texas, and Washington—offer state financial assistance to certain undocumented immigrant students, including DACA students. Several states, including Utah, allow public universities to use private funding sources to support financial aid to unauthorized immigrant students.
- Six states—Alabama, Arizona, Georgia, Indiana, Missouri, and South Carolina—bar unauthorized immigrant students from in-state tuition benefits.

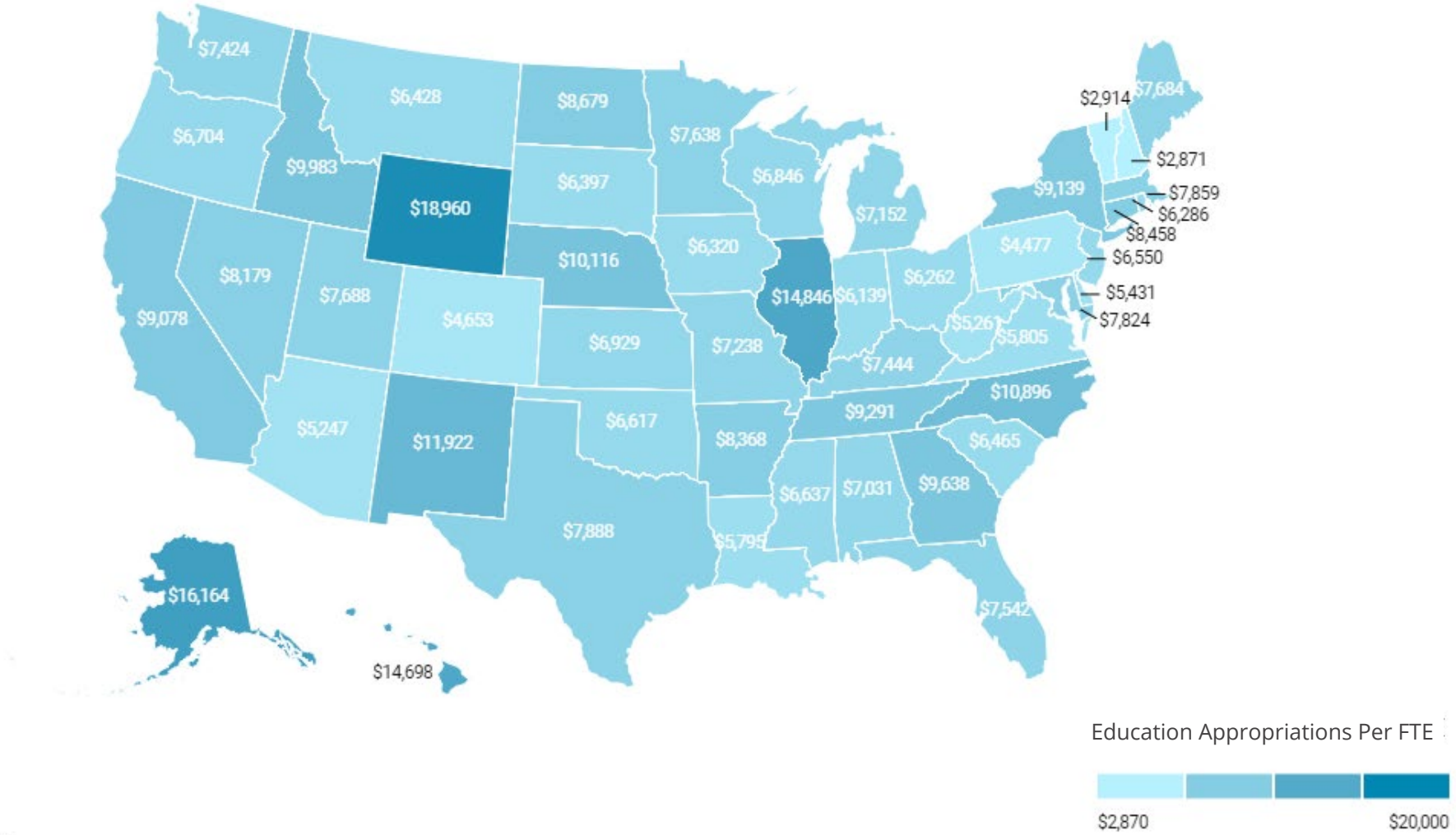
STATE FUNDING FOR HIGHER EDUCATION

While the nation has rebounded in many ways since the Great Recession, higher education has been slow to feel the effects of the current economic recovery, and states continue to face challenging budget environments. As most know, who work in the education environment, enrollment in higher education (especially community colleges) generally operates inversely to the economy's overall condition. As funding has flattened or been reduced and enrollment has declined. Institutions have shifted from less reliance of their financial operation on state funding to tuition revenue. These combined factors have created a challenging environment for institutions of higher education to navigate. This section of the environment scan will examine the trends, context, and consequences of state higher education funding across the country with specific information on where higher education funding stands in Arizona. Information regarding higher education finance from other states helps provide a context to understand and perhaps even appreciate the challenges the Arizona legislature and the institutions themselves have faced and will continue to do so for at least several more years.

In general, across the country, the following key trends are evident:

- A majority of states now rely primarily on tuition revenue to fund higher education. Twenty-eight states relied more heavily on tuition dollars than state and local appropriations to fund public higher education.
- Despite five years of increased support, states have not reached pre-recession funding levels. When adjusting for inflation, state support per student remains $1,000 lower than before the 2008 Great Recession and nearly $2,000 lower than before the 2001 dot-com crash. Only six states have met pre-recession funding levels.
- Student enrollment has continued to level off since the great recession. During the Great Recession, FTE enrollment increased from 10.2 million in 2008 to 11.5 million in 2012. As of 2017, FTE has decreased to approximately 11 million. State financial aid reached an all-time high. States allocated an average of $673 in financial aid per student, an 86% increase since 2000.

FIGURE 8.2 | MAP OF EDUCATION APPROPRIATIONS PER FTE, FY 2019 (ADJUSTED)



Notes:

1. Education appropriations are a measure of state and local support available for public higher education operating expenses, and exclude appropriations for independent institutions, financial aid for students attending independent or out-of-state institutions, research, hospitals, and medical education.
2. Constant dollars adjusted by the Higher Education Cost Adjustment (HECA).
3. Adjusted to account for interstate differences using the Enrollment Mix Index (EMI).
4. Adjusted to account for interstate differences using the Cost of Living Index (COLI). The COLI is not a measure of inflation over time.

Source: State Higher Education Executive Officers Association

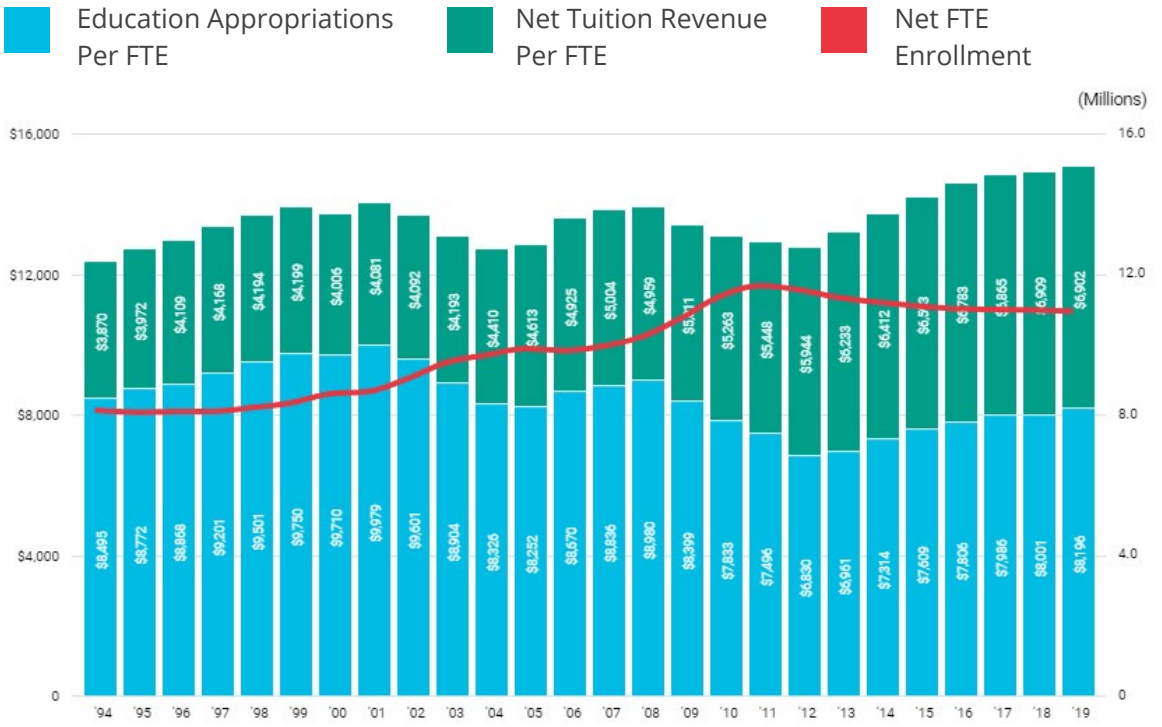
HIGHER EDUCATION FUNDING IN ARIZONA

To get a better understanding of the context and magnitude of the cuts placed on higher education in Arizona, this section of the report will present some state-level comparisons to the other 49 states.

Figure 8.2 provides data for each state that shows each state's educational appropriations per FTE enrollment for FY 2019. As is noted in the graphic, in 2019, Arizona allocated just $5,247 per FTE. This was the fifth-lowest amount in the country. The highest appropriation per FTE was in Wyoming at $18,960, and the lowest appropriation per FTE was in Vermont at $2,871.

Figure 8.3 provides data using a wave chart of the total funding for higher education in the United States for educational appropriations and net tuition revenue from 1994 through 2019. The red line on the chart displays the FTE enrollment nationally for each year of the funding. What is most notable about the graphic is the shift from state-provided appropriations being the majority of higher education funding on the left side of the graph to tuition being the majority of higher education funding as seen on the right side of the graph.

FIGURE 8.3 | PUBLIC FTE ENROLLMENT, EDUCATION APPROPRIATIONS PER FTE, AND NET TUITION REVENUE PER FTE, U.S. FY 1994-2019 (ADJUSTED)

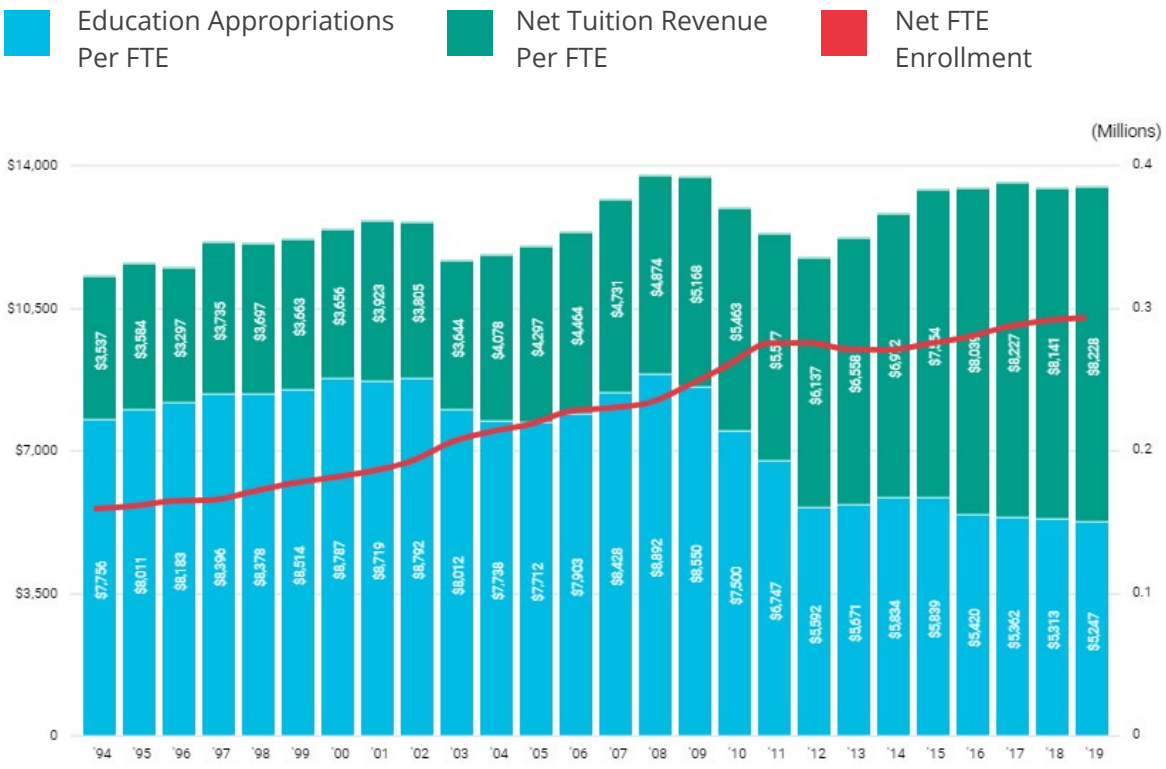


Notes:

1. Full-time equivalent enrollment converts student credit hours to full-time, academic year students, but excludes medical students.
2. Education appropriations are a measure of state and local support available for public higher education operating expenses, excluding appropriations for research, hospitals, and medical education.
3. Net tuition revenue is calculated by taking the gross amount of tuition and fees, less state and institutional financial aid, tuition waivers or discounts, and medical student tuition and fees.
4. Constant dollars adjusted by the Higher Education Cost Adjustment (HECA).
5. Adjusted to account for interstate differences using the Enrollment Mix Index (EMI).
6. Adjusted to account for interstate differences using the Cost of Living Index (COLI). The COLI is not a measure of inflation over time.

Source: State Higher Education Executive Officers Association

FIGURE 8.4 | PUBLIC FTE ENROLLMENT, EDUCATION APPROPRIATIONS PER FTE, AND NET TUITION REVENUE PER FTE, ARIZONA, FY 1994-2019 (ADJUSTED)



Notes:

1. Full-time equivalent enrollment converts student credit hours to full-time, academic year students, but excludes medical students.
2. Education appropriations are a measure of state and local support available for public higher education operating expenses, excluding appropriations for research, hospitals, and medical education.
3. Net tuition revenue is calculated by taking the gross amount of tuition and fees, less state and institutional financial aid, tuition waivers or discounts, and medical student tuition and fees.
4. Constant dollars adjusted by the Higher Education Cost Adjustment (HECA).
5. Adjusted to account for interstate differences using the Enrollment Mix Index (EMI).
6. Adjusted to account for interstate differences using the Cost of Living Index (COLI). The COLI is not a measure of inflation over time.

Source: State Higher Education Executive Officers Association

Figure 8.4 provides data using a wave chart of the total funding for higher education in Arizona for educational appropriations and net tuition revenue from 1994 through 2019. The red line on the chart displays the FTE enrollment in Arizona for each year of the funding. What is most notable about the graphic is the shift from state-provided appropriations being the majority of higher education funding on the left side of the graph to tuition being the majority of higher education funding, as seen on the right side of the graph. The trend of higher education funding in Arizona mirrors the trend at the national level.

Figure 8.5 shows the states with funding sources other than state tax appropriations. The ten states not listed in this table (and Washington, D.C.) rely on tax appropriations as the only major funding source for higher education.

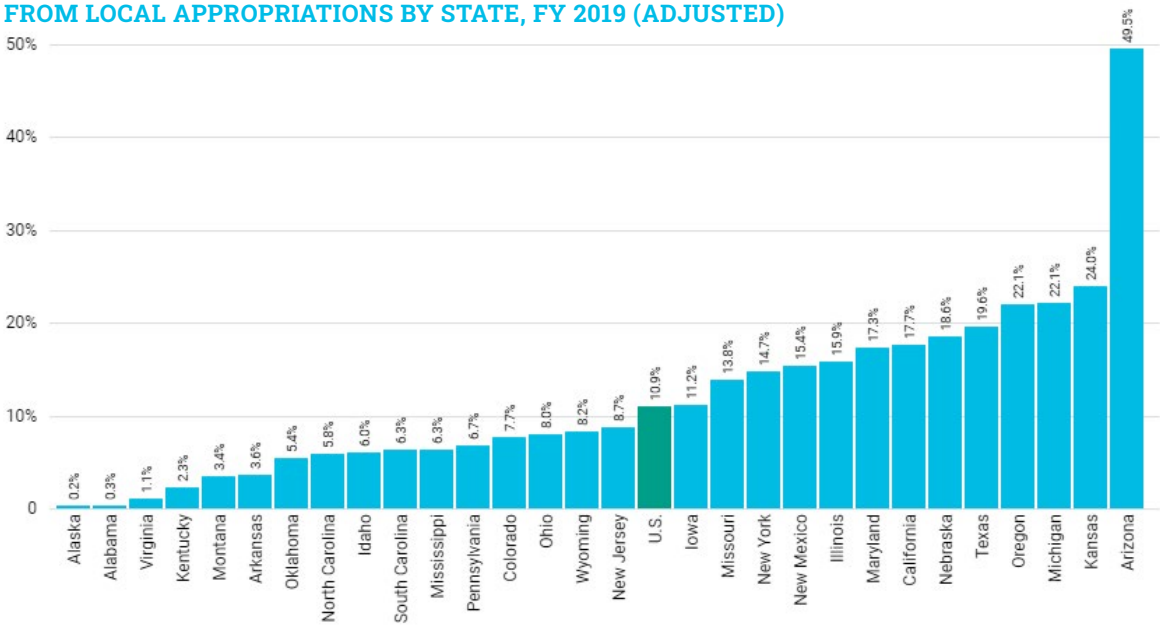
Arizona is the only state where most higher education funding did not come from state tax appropriations. Nearly half of higher education funding in Arizona comes from local appropriations. Kansas, Michigan, and Oregon were the only other states that relied on local appropriations for at least 20% of higher education funding. Twenty-one states received no local tax appropriations. Several Southern states with financial aid programs funded with lottery dollars were also less reliant on tax appropriations. Florida, Georgia, Kentucky, and South Carolina all relied on non-tax support for at least 20% of higher education funding.

Two noteworthy trends have emerged as states have become less reliant on tax appropriations over time:

Many states are increasingly reliant on local appropriations. Since 2004, the proportion of total funding from local appropriations has increased in 24 states. In seven states (Arizona, Iowa, Kansas, Nebraska, New Mexico, Oregon, and Texas), this proportion has increased by at least five percentage points.

Twenty states had increases in non-tax appropriations from 2004 to 2019. In five Southern states (Arkansas, Florida, Kentucky, South Carolina, and Tennessee), all with large lottery-funded student financial aid programs, non-tax support as a proportion of total funding increased by more than five percentage points.

FIGURE 8.5 | PERCENTAGE OF STATE AND LOCAL HIGHER EDUCATION FUNDING FROM LOCAL APPROPRIATIONS BY STATE, FY 2019 (ADJUSTED)



Notes:

1. Excludes states with no funding from the selected source.
2. Total state and local support is the sum of ARRA (American Recovery and Reinvestment Act) funds, tax appropriations, non-tax support, local appropriations, non-appropriated support, state-funded endowment earnings, and other state funds, net of any funds not available for use.
3. Constant dollars adjusted by the Higher Education Cost Adjustment (HECA).
4. Local appropriations are the sum of tax appropriations from any government entity below the state level to public institutions for operating expenses. Local appropriations do not include grants from local nonprofit organizations such as chambers of commerce and charitable foundations.

Source: State Higher Education Executive Officers Association

Overall, higher education in Arizona has taken the biggest hit from state-level appropriations than almost any other state in the country. As we will examine in the next section, community colleges in Arizona have taken the biggest reduction in funding than any other type of higher education institution in the state.

ARIZONA COMMUNITY COLLEGE FUNDING

The remainder of this section of the environmental scan will focus on state-level funding for community colleges in Arizona. State Aid funding had been eliminated from Maricopa Community College District since FY 2016. In FY 1981, State Aid represented 29% of the District's General Fund Budget. By FY 2007, MCCCD received State Aid funding of $57 million or 11% of its Operating Budget. State Aid was reduced by $50.6 million to $6.9 million in FY 2012 and finally eliminated in FY 2016. Additionally, $11.0 million of capital funding was eliminated since FY 2009. The last State Aid Funding received was $7.4 million of Operating and $1.4 of STEM funding in FY2015. No state funding has been provided since.

For FY 2020, the state legislature did provide some additional funding for the MCCCD via appropriations in STEM/workforce development and the Maricopa Health Care Specialty Expansion. Additional details are provided below in the FY summary information.

From FY 2010 to FY 2019, State Aid for the community college districts has decreased by 62.1%, from $132.4 million to $50.2 million. Before FY 2010, the highest appropriations were $162.8 million in FY 2007 and $164.6 million in FY 2008. The drop in State Aid has been due to various policy changes that have impacted the statutory funding formulas that calculate aid for the districts. The bulk of the State Aid that is appropriated to the community colleges is determined using three statutory formulas known as Operating Aid, STEM and Workforce Programs Aid, and Equalization Aid. Each type of aid is calculated and expended as required by statute.

Operating aid provides each community college district with funds for continuing operating and maintenance expenses pursuant to A.R.S. § 15-1466. Since FY 2016, statute or session law has excluded Maricopa and Pima County. Laws 2017, Chapter 310 restored Maricopa and Pima's eligibility for the funding, but current session law has continued to exclude the two counties. The Operating Aid formula adjusts State Aid by an amount that reflects changes in the FTSE enrollment count. This enrollment adjustment is calculated by multiplying the change in the most recent year's audited FTSE for each district by the average State Aid per FTSE appropriated in the current fiscal year.

STEM and Workforce Programs Aid provides community college districts with funds for partnerships, faculty, technology equipment, student services, facilities, and property needs pursuant to A.R.S § 15-1464. Since FY 2016, statute or session law has excluded Maricopa and Pima County. Laws 2017, Chapter 310 restored Maricopa and Pima's eligibility for the funding, but current session law has continued to exclude the two counties. The districts receive per capita funding based on the district's size and the most recent year's actual audited FTSE. The statutory formula provides $210 per FTSE for districts with 5,000 or less FTSE or $160 per FTSE for districts with greater than 5,000 FTSE.

Equalization Aid provides additional State Aid to community college districts with property tax bases less than the minimum assessed value specified in A.R.S. § 15-1402. Under the Equalization Aid formula, the minimum assessed valuation is revised by the average change in actual assessed valuation for the most recent year for all rural districts with populations of less than 500,000 persons. Aid is calculated at the

lesser of $1.37 per $100 of the district's assessed valuation or the district's levy rate. In any one year, a district's equalization assistance will depend on (1) whether the district falls below the minimum threshold and (2) the applicable tax rate.

Below is a brief year-by-year summary of the policy decisions that have impacted community college State Aid outside of normal formula adjustments associated with enrollment changes from FY 2010 to FY 2019:

FY 2010

Laws 2009, Chapter 9 permanently eliminated the hold harmless provision in the Operating Aid statutory formula, which "held harmless" districts with declining Full-Time Student Equivalent (FTSE) enrollment. The policy change decreased Operating Aid by $1.7 million in FY 2010. The FY 2010 budget also included an additional lump sum reduction of $9.2 million in Operating Aid. The budget continued to suspend Capital Outlay Aid, but fully funded Equalization Aid. Total State Aid in FY 2010 was $132.4 million, 2.4% less than FY 2009.

FY 2011

Starting in FY 2011, Laws 2009, Chapter 9 permanently adjusted the Operating Aid formula so that dual enrollment students can only be funded at 50%. Dual enrollment refers to high school students enrolled in community college courses for both high school and community college credit. Laws 2010, Chapter 9 suspended formula, increases for Operating Aid and Equalization Aid, and continued to suspend all Capital Outlay Aid. FY 2011 State Aid remained flat at the FY 2010 funding level of $132.4 million.

FY 2012

The FY 2012 budget included a decrease of $72.9 million in Operating Aid. Each district's Operating Aid was reduced by 6.2% of its total operating revenues, comprised of State Aid, primary property tax, and tuition and fees. The budget continued to suspend all Capital Outlay Aid but fully funded the Equalization Aid formula. State aid decreased by 48.2% from FY 2011 to a total of $68.6 million.

FY 2013

The FY 2013 budget fully funded caseload changes in Operating and Equalization formulas and continued to suspend Capital Outlay Aid, resulting in state aid of $63.3 million, 7.6% less than FY 2012.

FY 2014

The FY 2014 budget fully funded Operating and Equalization Aid formulas. The budget continued to suspend Capital Outlay Aid's formula but provided $2.0 million for Capital Outlay purposes. The $2.0 million was distributed to each district, excluding Maricopa and Pima, based on each district's proportional share of the total FTSE. Laws 2013, Chapter 223 replaced the name Capital Outlay Aid with STEM and Workforce Programs Aid, but the formula remained unchanged. Total state aid for community colleges in FY 2014 was $62.8 million, a 0.9% decrease from the prior year.

FY 2015

The FY 2015 budget fully funded Operating Aid and Equalization Aid. Laws 2014, Chapter 16 suspended the formula for STEM and Workforce Programs Aid. Still, the budget provided full STEM formula funding for rural districts and an additional $2.0 million for Pima and Maricopa ($0.6 million and $1.4 million, respectively). State aid increased by $2.0 million, or 3.3% from FY 2014, to a total of $64.8 million.

FY 2016

Laws 2015, Chapter 16 permanently eliminated Operating Aid for Maricopa and Pima, resulting in savings of $12.8 million in FY 2016. Laws 2015, Chapter 16 also suspended the STEM and Workforce Aid formula in FY 2016 and permanently eliminated STEM Aid for Maricopa and Pima. The FY 2016 budget partially funded STEM Aid for Pinal and fully funded STEM Aid for the remaining rural districts, resulting in savings of $15.9 million in FY 2016. The budget fully funded the Operating and Equalization Aid formulas. FY 2016 state aid was $48.0 million, or 26% less than FY 2015.

FY 2017

Laws 2016, Chapter 130 continued to suspend the STEM and Workforce Aid formula in FY 2017, and the FY 2017 budget continued to partially fund STEM Aid for Pinal and fully fund STEM Aid for the remaining rural districts, resulting in savings of $751,000. The budget fully funded the Operating and Equalization Aid formulas. FY 2017 state aid was $47.7 million, or 0.6% less than FY 2016.

FY 2018

Laws 2017, Chapter 310 permanently restored Maricopa and Pima County's eligibility for Operating State Aid and STEM and Workforce Program State Aid. Laws 2017, Chapter 310, however, also suspended both formulas for FY 2018. The FY 2018 budget continued to partially fund STEM Aid for Pinal and fully fund STEM Aid for the remaining rural districts, resulting in savings of $714,100. The budget did not fund STEM Aid for Maricopa and Pima, resulting in savings of $13,565,600. It also does not fund Operating State Aid for Maricopa and Pima. The budget fully funded the Equalization Aid formula. FY 2018 state aid was $48.6 million, or 1.9% more than FY 2017. These amounts included $250,000 for additional Gila Workforce Development Aid, of which $200,000 is ongoing.

FY 2019

However, Laws 2018, Chapter 281, continue to suspend both the Operating State Aid and STEM Aid formulas for FY 2019. The FY 2019 budget partially funds STEM Aid for Pinal and fully funds STEM Aid for the remaining rural districts, resulting in a savings of $672,600. The budget does not fund STEM AID for Maricopa and Pima, resulting in a savings of $13,499,200. It also does not fund Operating State Aid for Maricopa and Pima. The budget fully funds the Equalization Aid formula. The state provided a total of $50.2 million, or 3.3% more than FY 2018.

State aid represents a portion of the total operating revenues that the community college districts take in each year. Table 8.1 shows a year-by-year breakout of state aid, overall revenues, percentage of revenues made up of state aid, and total FTSE counts from FY 2010 to FY 2019.

FY2020

The budget includes a one-time increase of $2,000,000 from the General Fund in FY 2020 to fund STEM and workforce development in Maricopa and Pima Community College Districts. Of the $2,000,000, Maricopa is appropriated $1,600,000 and Pima is appropriated $400,000. The FY 2020 General Appropriation Act (Section 134) appropriates these amounts in FY 2020, FY 2021, and FY 2022.

The FY 2020 budget also includes $5,800,000 from the General Fund in FY 2020 for Maricopa Health Care Specialty Expansion. This is a one-time increase from the General Fund for costs associated with expanding the health care specialty program in the Maricopa County Community College District. This funding is expected to double the Paradise Valley Community College's Integrated Health Science Center's enrollment capacity. The expansion would focus on six specialty areas: operating room, emergency care, telemetry, oncology, intensive care unit, and home care.

For many students, community college represents the only affordable pathway to getting a post-secondary education. While costs remain relatively low at Arizona's community colleges despite nearly a decade of budget cuts, the expenses associated with getting a college education are rising. For students who have to mind every penny they have, any increase in attendance cost can mean the difference between getting an education and going without. Unfortunately for some Arizona college students, additional budget cuts may put them in the latter category.

TABLE 8.1 | ARIZONA COMMUNITY COLLEGE STATE AID HISTORY ($ IN MILLIONS)

	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
State Aid	132.4	68.6	63.3	62.8	64.8	48	47.7	48.6	50.2	46.9
Revenue	1,693.7	1,659.5	1,631.6	1,633.7	1,647.1	1,633.7	1,653.2	1,747.2	1,747.2	1,777.9
Aid % of Revenue	7.8%	4.1%	3.9%	3.8%	3.9%	2.9%	2.9%	2.8%	2.9%	2.6%
FTSE[1]	123,797	135,789	145,470	141,474	133,917	128,085	122,622	116,494	115,951	113,426

[1]FTSE is based on the actual audited count 2 years prior to the funded amount. For example, the FTSE count from FY 2018 is shown in the FY 2020 column since the FY 2018 count is used to determine FY 2020 funding.

Source: JLBC Staff Program Summary | State Aid for Community Colleges

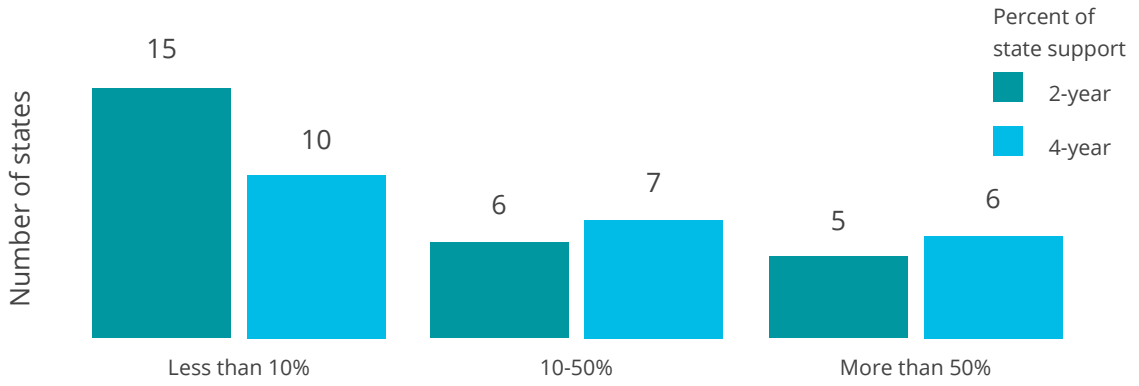
PERFORMANCE BASED FUNDING

Performance-based funding (also known as outcome-based funding) has been around in some form in the higher education sector since 1979. The idea of funding institutions based on performance or outcomes rather than inputs appeals to legislators and policymakers facing tight budgets and looking to improve returns on the investment of public dollars. However, implementing and sustaining a performance-based funding system can be difficult in practice.

In 2017, the State Higher Education Executive Officers (SHEEO) conducted two surveys on performance-based funding. The surveys gathered information on the year the funding system began, outcome metrics, and the amount of funding allocated based on these performance metrics. Of 28 respondents, 20 indicated their system or state had performance-based funding in fiscal 2017 (see Figure 8.6). Most states indicated that performance-based funding had been adopted recently. Only Indiana, Kansas, Tennessee, Washington, and Wyoming indicated that the current model was adopted before 2012. In most states, performance-based funding is applied to both the four-year and two-year sectors. However, in Illinois, New York, Texas, and Wyoming, performance-based funding only applied to the two-year sector, and in Mississippi, it only applied to the four-year sector.

The survey and follow-up research also found that states vary in the amount of state support allocated based on institutional performance. As Figure 8.6 illustrates, most states allocate less than 10% of state support through the performance-based formula, particularly at two-year institutions.

FIGURE 8.6 | PERCENT OF STATE SUPPORT ALLOCATED THROUGH OUTCOMES-BASED FUNDING



Source: State Higher Education Executive Officers, Dougherty et al (2016)

Initial research on these programs suggests that performance-based funding models which incentivize progression and completion for underrepresented populations can, in some cases, benefit the targeted populations. Sixteen out of the 20 states included at least one underrepresented student metric (Table 8.2). A metric for low-income students—usually using Pell Grant eligibility as a proxy—was the most common, followed by students needing developmental or remedial education.

As shown in Table 8.2, only a few have had a continuously implemented performance-based funding system for more than a decade. Each of these states has updated and modified the funding system during this time and continuously allocated a portion of funding based on performance. Other states' experiences with performance-based funding have been more volatile, often in one of three ways:

- The performance-based funding system is implemented in some years but not others. Examples: Kansas, Mississippi, Oklahoma. In each state, educational appropriations per FTE declined in 2017. In Mississippi, the performance-based funding formula was not used due to this funding reduction. In Kansas and Oklahoma, the performance-based formula only kicks in when state support increases.
- The performance-based funding system goes through significant revisions. Examples: Arkansas, Missouri, Utah. Each state is refining the current system to allocate more state support based on performance.

TABLE 8.2 | OUTCOMES-BASED FUNDING STATUS AND EQUITY METRICS

STATE	2-YEAR SECTOR	4-YEAR SECTOR	FISCAL YEAR STARTED	EQUALITY METRICS
Arkansas	Yes	Yes	2012 (New model 2019)	Minority, low-income, remedial, adult
Colorado	Yes	Yes	2016	Low-income
Florida	Yes	Yes	2014	Low-income
Illinois	Yes	No	2013	Minority, low-income, adult
Indiana	Yes	Yes	2004	Low-income, remedial
Kansas	Yes (unfunded)	Yes (unfunded)	2006	
Massachusetts	Yes	Yes	2016	Minority, low-income
Mississippi	No	Yes (unfunded)	2014	Remedial
Missouri	Yes	Yes	2012 (New model 2019)	Low-income (new model)
Montana	Yes	Yes	2015	Minority, low-income, adult, veteran
New Mexico	Yes	Yes	2013	Low-income
New York	Yes	No	2015	
North Dakota	Yes	Yes	2014	
Ohio	Yes	Yes	2015	Minority, low-income, remedial, adult, first-generation
Oklahoma	Yes (unfunded)	Yes (unfunded)	2012	Low-income
Tennessee	Yes	Yes	2010	Low-income, remedial, adult
Texas	Yes	No	2014	Remedial
Utah	Yes	Yes	2013	Low-income
Washington	Yes	No	2007	Remedial
Wyoming	Yes	No	2011	

Source: State Higher Education Executive Officers

- The performance-based funding system is discontinued. Examples: Arizona, Massachusetts, Minnesota. In these states, the performance-based model was discontinued after it lost political support or was considered ineffective.

As state policymakers become more interested in improving student success, performance-based funding has become a popular policy option to incentivize improvement. However, the most recent survey results suggest that state experiences vary greatly and challenges sustaining a performance-based system remain after initial implementation.

FREE COMMUNITY COLLEGE

Over the last 10-15 years, in reaction to soaring college costs and state education cuts, at least 15 states and more than 200 localities developed initiatives that provide some form of tuition-free community college education with hopes that the return on investment will boost their area economies.

The idea of free community college started drawing attention in 2015 when President Obama proposed making community college free nationwide. At the time, the idea sounded far-fetched to many, even though a form of the initiative was already being implemented in several states such as Tennessee and Oregon. The idea continued to generate even more buzz during the 2016 presidential election when both Bernie Sanders and Hillary Clinton threw in their support. Obama, Sanders, and Clinton wanted both the federal and state governments to split the tab. But the idea has not gained support at the federal level so far. At the state level, several states have forged ahead by implementing free tuition as a way to create a strong workforce. Some of the initiatives that have been developed have expanded beyond just free community college by providing "promises" that allow students to attend either two or four-year colleges of their choice. Figure 8.7 provides a summary and short description of what is currently in place across the country.

The growing support of free community college and higher education, in general, underscores how the issue of higher education is viewed as an economic generator within regional geographic environments. With more states like California and Texas considering free community college initiatives, state leaders are displaying an understanding that access to higher education is an important quality of life and economic issue. Even four-year institutions, which were initially concerned about how free community college would impact their bottom lines, support increased access to community college as a way to bolster student completion rates and drive increased transfer students to their institutions.

Free community college comes with a hefty price tag. For example, Oregon Promise, established by the state legislature in 2015, scrambled after its first year, 2016-17, when lawmakers appropriated less than needed to continue the program in its original form. Demand had risen more than expected. The Oregon legislature increased funding from $10 million to $40 million in its next two-year budget, but that was still $8 million short of the funds needed.

Four states and one city have enacted measures in the past few years. Lawmakers in several other places across the country are considering similar programs. However, the impact of these initiatives is

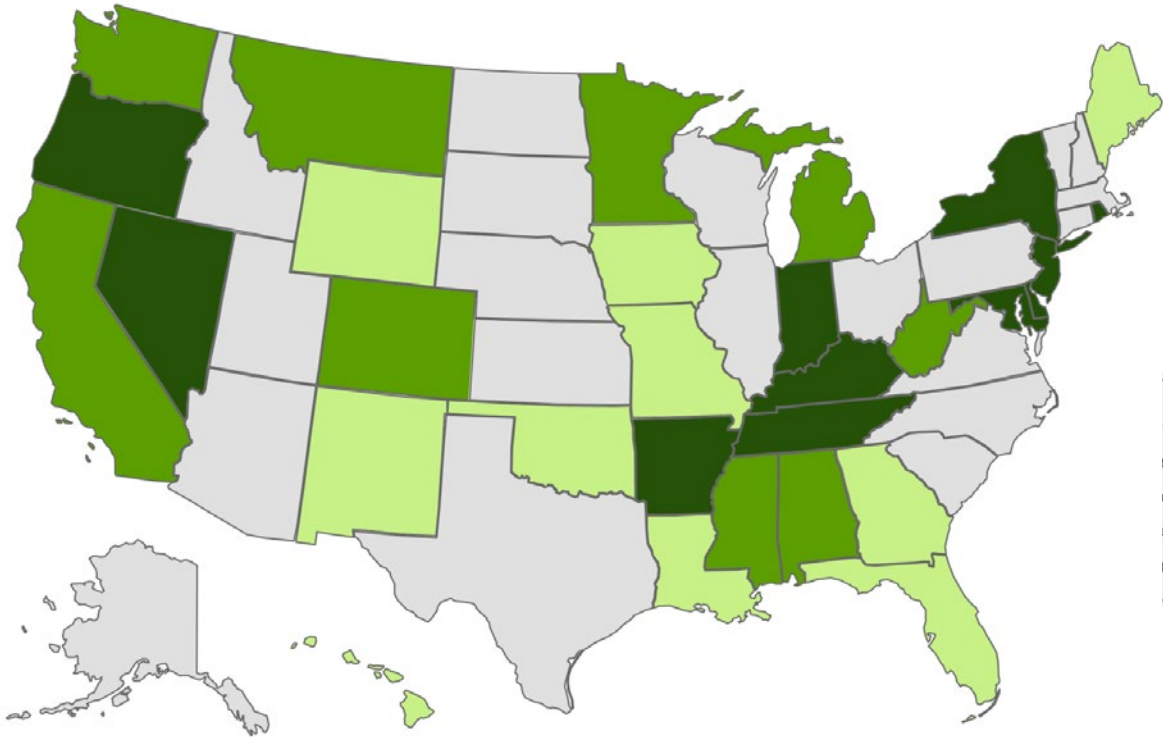
unmistakable. More than 30,000 Tennesseans and 7,000 Oregonians have gone to community college tuition-free already. Students in New York and San Francisco will soon have similar opportunities. Even today, the ideas continue to gain momentum, with lawmakers in several other places across the country considering similar programs.

In most states, the initiatives use scholarships that cover the remaining cost of tuition after using other needs-based grants. Some plans have an income cap, and others are limited to recent high school graduates. However, free tuition doesn't mean there aren't any costs to the student. Students who live on campus also need to pay for room and board themselves. Sometimes there are additional fees that colleges charge for technology use, orientation, or other items, that aren't covered. Because the programs are being locally designed and implemented, each initiative has its own set of specific parameters unique to the local environment where they are being offered.

SOURCES:

- Immigrant Policy Project Report on State Immigration Laws, 2019 National Conference of State Legislatures; January 2020.
- SHEEO: State Higher Education Finance Report: FY 2019
- State Aid for Community Colleges: Joint Legislative Budget Committee Report; FY 2020 Appropriations Report (2020).

FIGURE 8.7 | FREE COLLEGE IN THE UNITED STATES, 2018



CHAPTER 9 MCCCD & PEER INSTITUTIONS BENCHMARKING

FOCUS AREA:

For community colleges, the overarching goal is increasing student success as measured by student learning; course completion and retention rates; and the rate at which students earn credentials, graduate, and/or transfer to four-year institutions. The goal of student success should be firmly rooted in community college practice and should drive all institutional decision making. To do this, you must understand your own institutional data and how your data compares to other colleges with similar missions. This section of the environmental scan focuses on some key performance measures indicative of overall success by community colleges. A series of charts and graphs compare the ten MCCCD institutions against some selected peer institutions using a benchmarking approach to data collection.

QUESTIONS FOR THIS FOCUS AREA:

- How well are we doing compared with other colleges that are similar to us on key performance measures?
- How are colleges that face similar challenges achieving better results?
- Can we adopt best practices from other colleges that will help improve our performance?

INTRODUCTION

Benchmarking is the systematic process of comparing an organization's performance on key measures to others' performance. Colleges can undertake benchmarking within a peer group of institutions to make an apples-to-apples comparison. They can use evidence-based practice as an entry point, identifying organizations that demonstrate world-class performance in particular areas or benchmark internally to seek continuous improvement over their baseline performance.

There is a growing body of evidence about the practices that effectively improve outcomes at community colleges. More and more community colleges are completing benchmarking initiatives to maximize the value of this evidence and improve their practice to better serve their students. Benchmarking helps colleges in multiple ways.

It gives colleges:

- A process for establishing baselines, setting goals, and measuring progress toward those goals.
- A method to gauge and monitor their performance in areas central to their missions and goals.
- A means of answering the question of how their performance compares to the national average — and a reminder to ask whether that average is good enough.

As a result, benchmarking provides a basis for colleges to set priorities. Given the scarcity of resources and the large number of programs and practices colleges manage, they have to determine the best uses for their limited resources. Benchmarking helps colleges learn about effective practices in the field so they can devote resources to programs that are most likely to help the greatest number of students. Benchmarking also creates opportunities for colleges to share information and promising practices with other colleges committed to collecting and learning from data. When colleges participate in programs designed to facilitate this kind of information exchange, they typically report that every institution, including the high-performing colleges, benefits from the interaction. Finally, benchmarking sets the stage for colleges to ask and answer questions that will improve their practice and help more students succeed. When a college benchmarks for student success, the process leads administrators, faculty, and staff to ask:

- How well are we doing compared with other colleges that are similar to us? In this context, similar can refer to enrollment, setting (urban, suburban, or rural), institutional mission, demographics of the student body, makeup of the faculty, etc.
- How are we doing over time? What approaches are working and should be scaled up? What should we stop doing?
- How are colleges that face similar challenges achieving better results? What can we learn from them? How can we adapt their approaches to work at our college?
- How good do we want to be? What metrics and standards should we use to define excellence in the areas most central to fulfilling our mission?

This section of the environmental scan will focus on ten primary data points. There is an extraordinary amount of data available data that can be used to benchmark institutions. However, due to this environmental scan's limited scope, a handful of key performance measures were selected to get the process started at your institution. The following ten key performance measures were selected for this benchmarking process:

1) Unduplicated headcount enrollment

2) FTSE enrollment

3) Full-time & part-time enrollment

4) Distance education enrollment

5) Retention rates for full-time & part-time students

6) Graduation & transfer rates

7) Associate's degrees awarded

8) Average cost of attendance

9) Students per FTSE instructional staff

10) FTSE instructional staff

Another key step in the benchmarking process is determining who to benchmark yourself against. Often institutions will benchmark themselves using a predetermined set of performance measures and then seek a list of exemplary institutions in those performance measures and see how they compare. Another way to benchmark is to select a group of peer institutions similar in demographic characteristics and then see how your institution performs compared to the peer institutions. For this section of the environmental scan, SmithGroup consulted with the MCCCD Institutional Research Office for assistance in selecting a recognized set of peer institutions that could be compared to the ten MCCCD colleges. Based upon that consultation, the following institutions were selected for this benchmarking process:

BENCHMARKING PEER COLLEGES

LOS ANGELES COMMUNITY COLLEGE DISTRICT:

1) Los Angeles City College

2) East Los Angeles College

3) Los Angeles Harbor College

4) Los Angeles Mission College

5) Los Angeles Pierce College

6) Los Angeles Southwest College

7) Los Angeles Trade-Tech College

8) Los Angeles Valley College

9) West Los Angles College

DALLAS COMMUNITY COLLEGE DISTRICT:

1) Brookhaven College

2) Cedar Valley

3) Eastfield College

4) El Centro College

5) Mountain View College

6) North Lake College

7) Richland College

SAN ANTONIO COLLEGE (SAN ANTONIO, TX):

1) Northeast Lakeview College

2) Northwest Vista College

3) Palo Alto College

4) St. Phillips College

5) San Antonio College

CITY COLLEGES OF CHICAGO:

1) Richard J Daley College

2) Kennedy-King College

3) Malcolm X College

4) Olive-Harvey College

5) Harry S Truman College

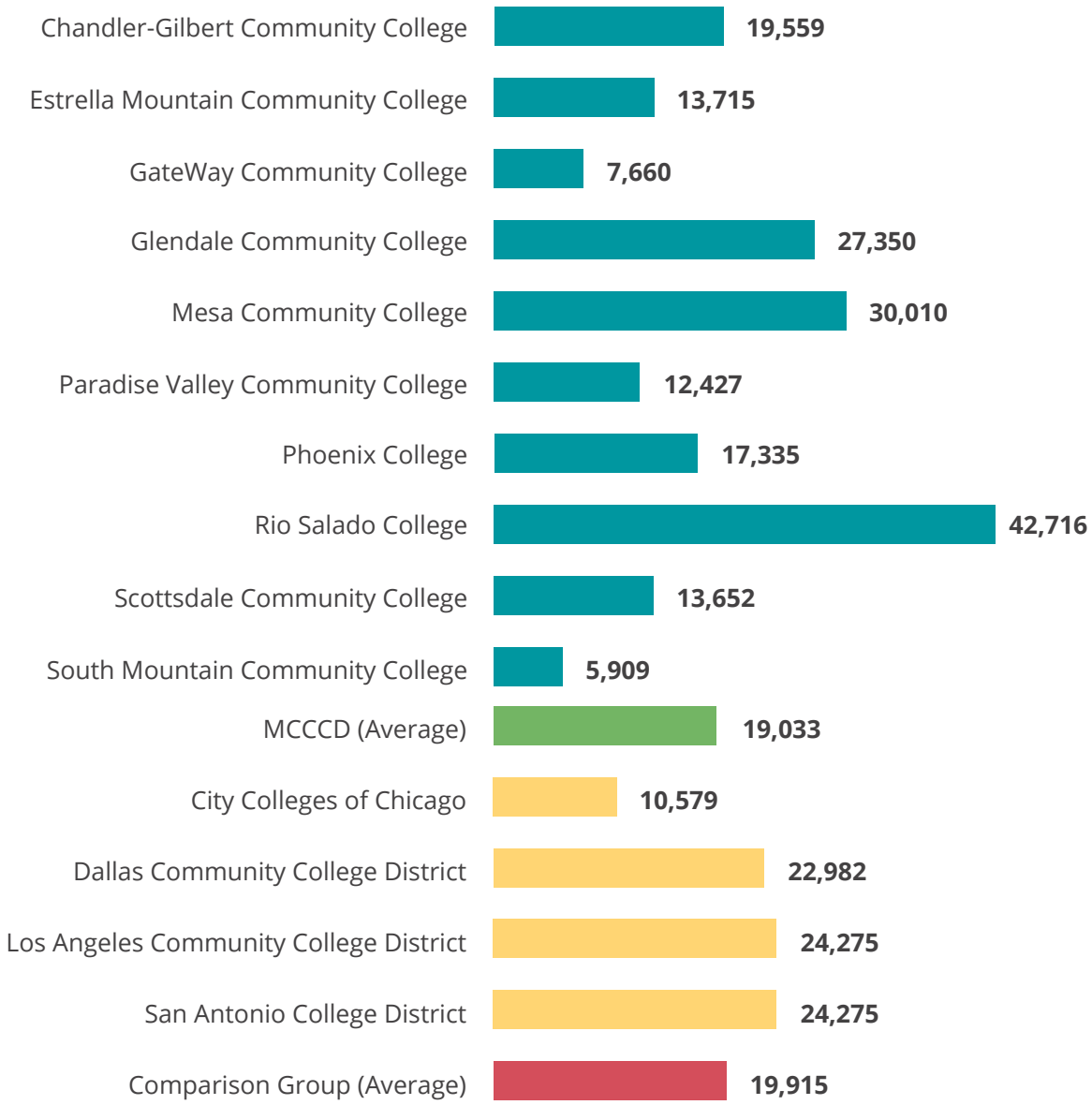
6) Harold Washington College

7) Wilbur Wright College

The remainder of this section of the environmental scan will present tables, charts, and graphs related to the ten performance measures selected and using the ten MCCCD colleges and the selected peer institutions for comparison. College-level data will be shown for each of the ten MCCCD colleges, as well as a computed district average. For the peer institutions, individual college-level data has been aggregated to provide a "district average," also, a comparison group average has also been calculated to assist in the benchmark comparisons.

All data used for the benchmarking analysis has come from the Integrated Postsecondary Education Data System, also known as IPEDS. It is a system of interrelated surveys conducted annually by the U.S. Department of Education's National Center for Education Statistics (NCES). IPEDS gathers information from every college, university, and technical and vocational institution that participates in the federal student financial aid programs. IPEDS collects data in eight areas: institutional characteristics; institutional prices; admissions; enrollment; student financial aid; degrees and certificates conferred; student persistence and success; and academic libraries, institutional, and human fiscal resources. All of the data used in this benchmarking analysis is from the most recent release of the data at the time from the fall of 2018.

FIGURE 9.1 | UNDUPLICATED TOTAL 12-MONTH HEADCOUNT: 2017-18



Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) 2019

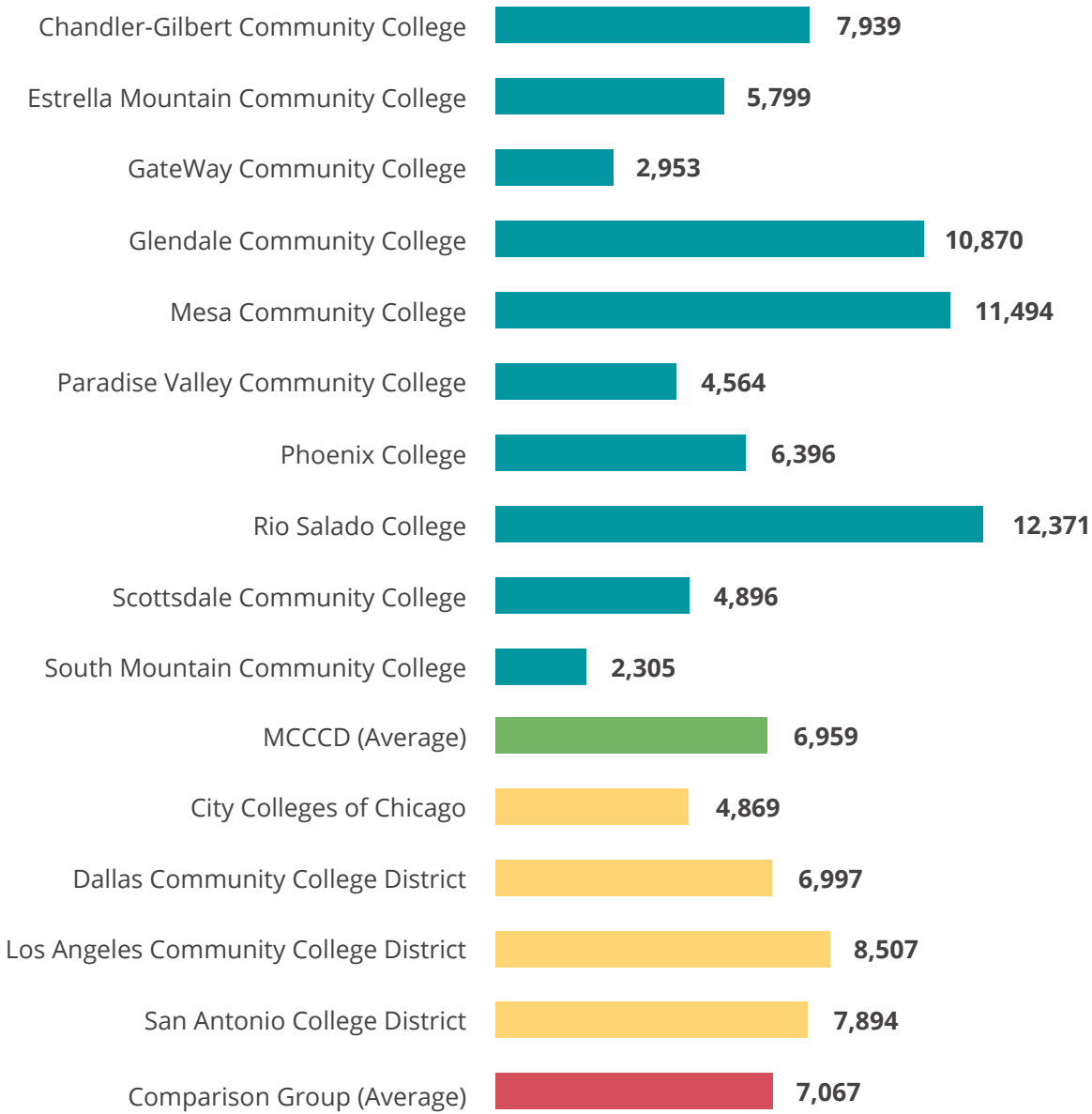
UNDUPLICATED HEADCOUNT

Figure 9.1 provides a comparison of headcount enrollment for MCCCD and the peer institutions. As indicated in the chart, three of the MCCCD colleges have a larger enrollment than the peer group's average. It should also be noted that South Mountain Community is about half the size of the smallest peer average (City Colleges of Chicago). However, from a peer comparison perspective, the average enrollment of MCCCD (19,033) is nearly identical to the peer group's average (19,915).

FTSE ENROLLMENT

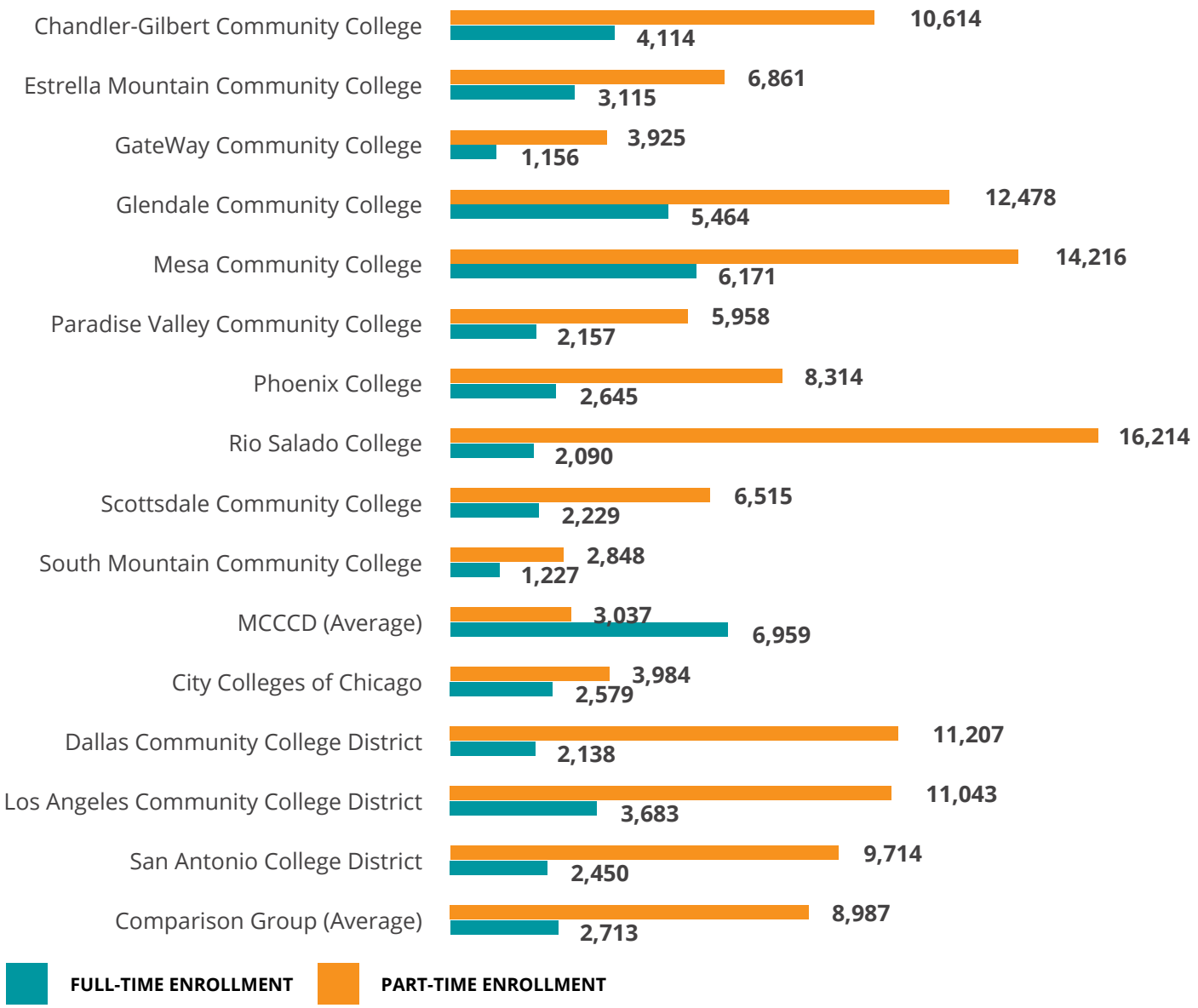
The FTSE enrollment of the MCCCD and the peer group is comparable in size like the headcount enrollment. The FTSE enrollment for MCCCD is 6,959, and the average FTSE for the comparison group is 7,067.

FIGURE 9.2 | FTE ENROLLMENT: 2017-18



Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) 2019

FIGURE 9.3 | FULL-TIME VS. PART-TIME ENROLLMENT: FALL 2018



Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) 2019

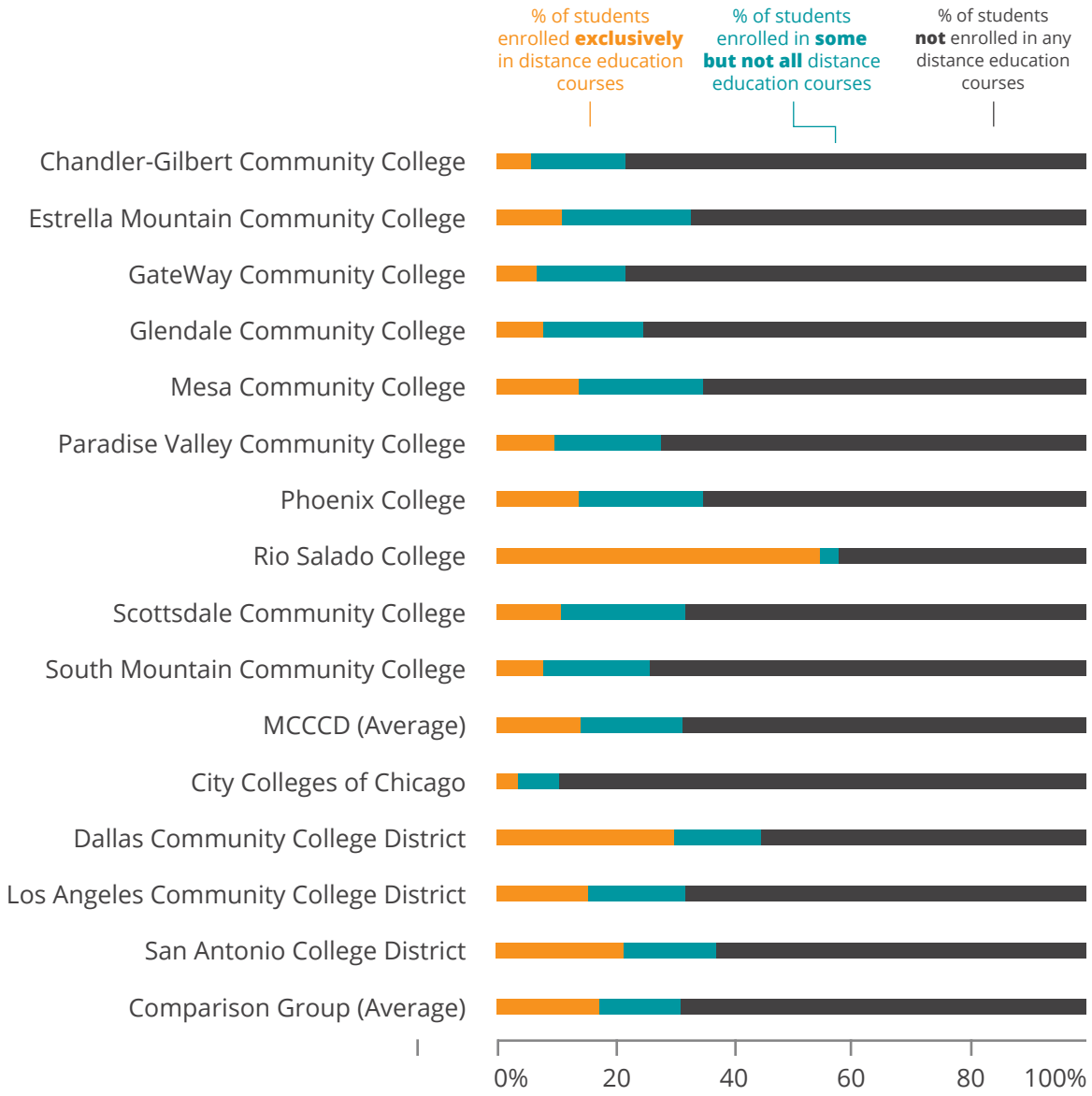
FULL-TIME & PART-TIME ENROLLMENT

One of the biggest differences between four-year institutions and two-year institutions is the percent of full-time students compared to part-time. One of the main reasons that most students attend a community college is that it provides greater opportunity for them to attend classes to pursue a degree and often work full-time simultaneously. However, as research has shown, students that take classes on a part-time basis are retained at a lower rate and have a lower graduation rate. Figure 9.3 provides data that shows the full-time and part-time enrollments of students at MCCCD compared to the peer institutions.

DISTANCE EDUCATION ENROLLMENT

Figure 9.4 compares enrollments in distance education courses. Student enrollment at MCCCD and the peer institutions are sorted into three categories: online-only students, students taking a mix of online and seated courses, and students not enrolled in any online courses. As shown in the data, Rio Salado has a significant online enrollment that is much greater than any of the other institutions and districts. City Colleges of Chicago lags significantly in online course taking by students. The Dallas Community College District has the greatest online enrollments over any of the peer institutions.

FIGURE 9.4 | DISTANCE EDUCATION FALL 2018



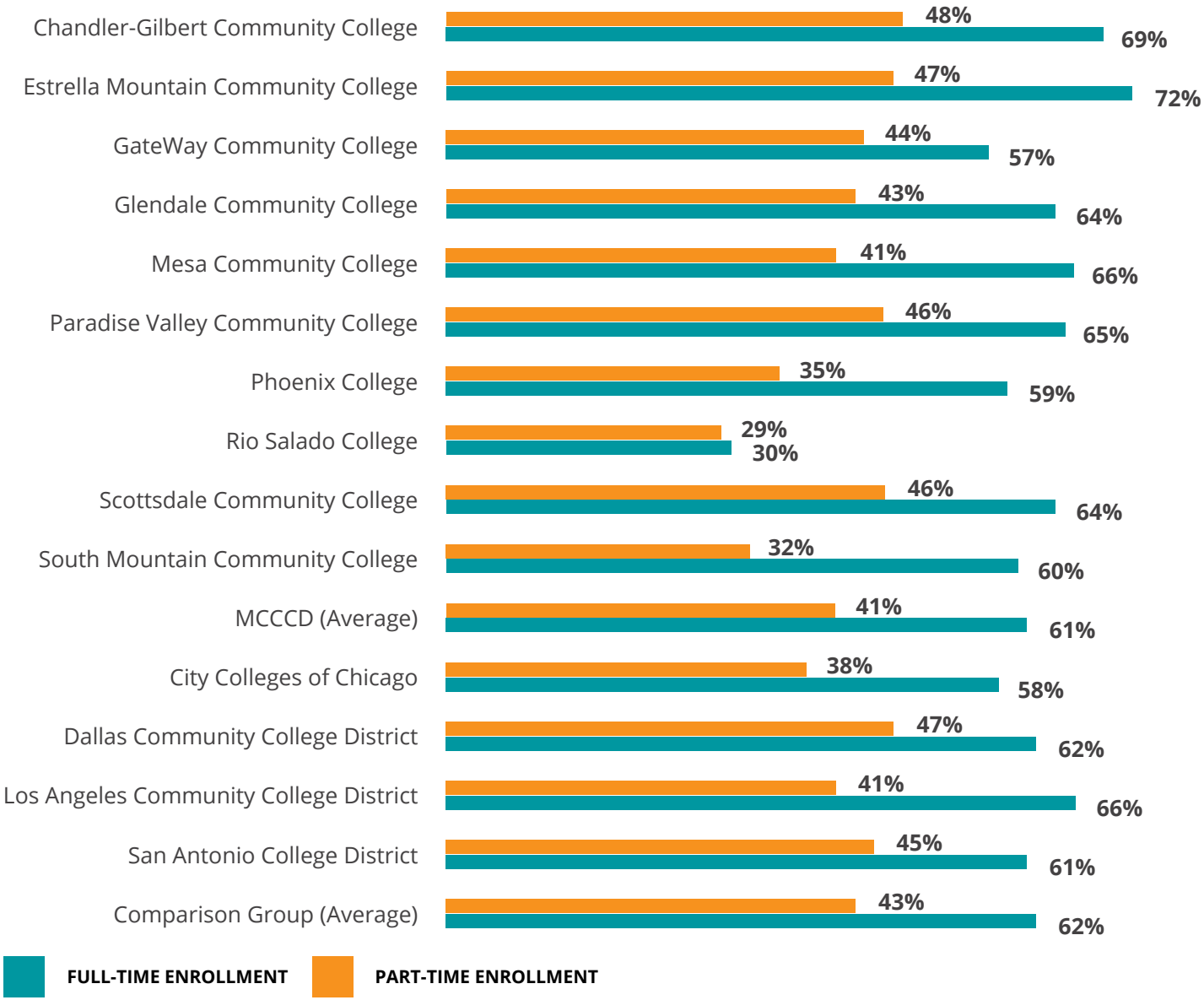
Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) 2019

RETENTION RATES FOR FULL-TIME & PART-TIME STUDENTS

A significant body of research shows that college students who enroll full-time, taking even 12 credits' worth of course work in a single semester, are much more likely to stick with college, save money, and eventually graduate. According to the American Association of Community Colleges, only 38% of community college students are enrolled full-time. As a result of this research, we know that a significant indicator of student success can be determined just by the enrollment level of students. Colleges can focus on strategies that will nudge more students to attend full-time. Still, there should also be greater attention paid to understanding how colleges can adopt strategies that help part-time students persist at a higher level. For various reasons, community colleges will always have a significant share of their enrollment on a part-time basis.

Figure 9.5 provides data on the percentage of students retained from fall 2017 to fall 2018 based on their part-time or full-time enrollment status at each college included in this study. Estrella Mountain has the highest retention of full-time student enrollment within the MCCCD at 72%. From the peer institutions, the Los Angeles Community College District has the highest retention of full-time students at 66%. The highest part-time retention rate within the MCCCD is 48% at Chandler-Gilbert Community College. The highest part-time retention rate within the peer institutions is found at Dallas County Community College District at 47%.

FIGURE 9.5 | FIRST TIME, DEGREE-SEEKING STUDENT IN FALL 2017 RETURNING IN FALL 2018



Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) 2019

GRADUATION & TRANSFER RATES

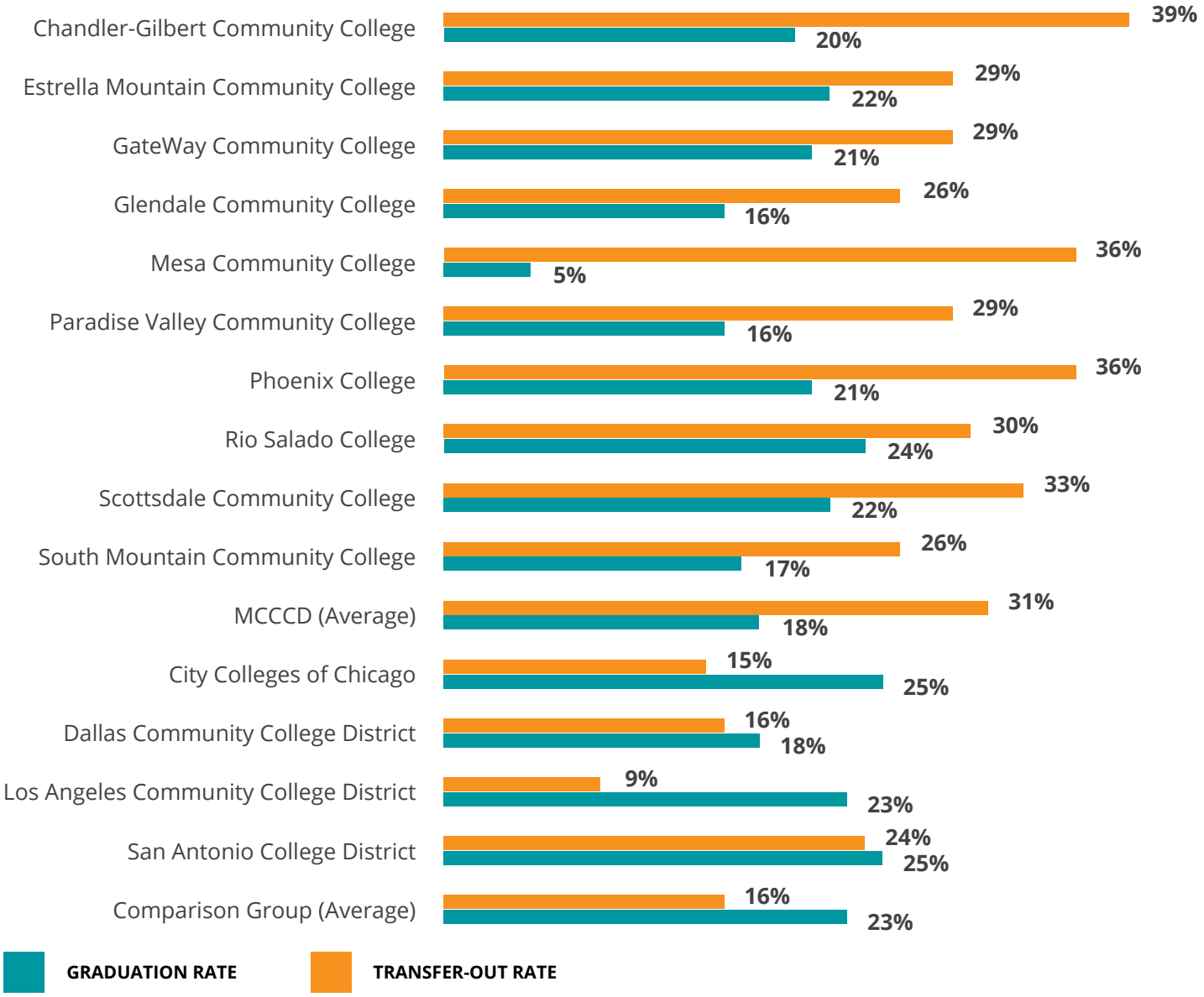
Nationally, data from the National Center for Education Statistics (NCES) shows that only 13% of community college students graduate in two years. Within three years, approximately 22% of students graduate, and within four years, the rate stands at 28%. Often data on community college students and graduation and transfer rates do not tell the whole story. Because of how students are accounted for in state data systems, there are often many success stories that are not reflected in the data. Some community college "dropouts" might include students who transfer to a four-year institution before earning their associate's degree. While they did not finish their education at the community college, they moved onto bigger goals for their education and their future. Some studies indicated that one-fourth of all college students who begin at a community college go on to a four-year institution. Of those, 60% graduate with their bachelor's degree. Yet, in many reports, these students are lumped into the "dropout" category, thus making community college graduation rates look worse than they are.

Regardless of the anomalies in the data collection process, graduation rates and transfer-out rates should be monitored as at least one of the many key performance indicators for the success rates of an institution's students.

Figure 9.6 provides data for the graduation and transfer-out rates for the MCCCD colleges and the peer institutions. Overall, Rio Salado has the highest graduation rate for their 2015 cohort of students with a graduation rate of 24%. This is comparable to the graduation rate at the San Antonio College District, which is 25%.

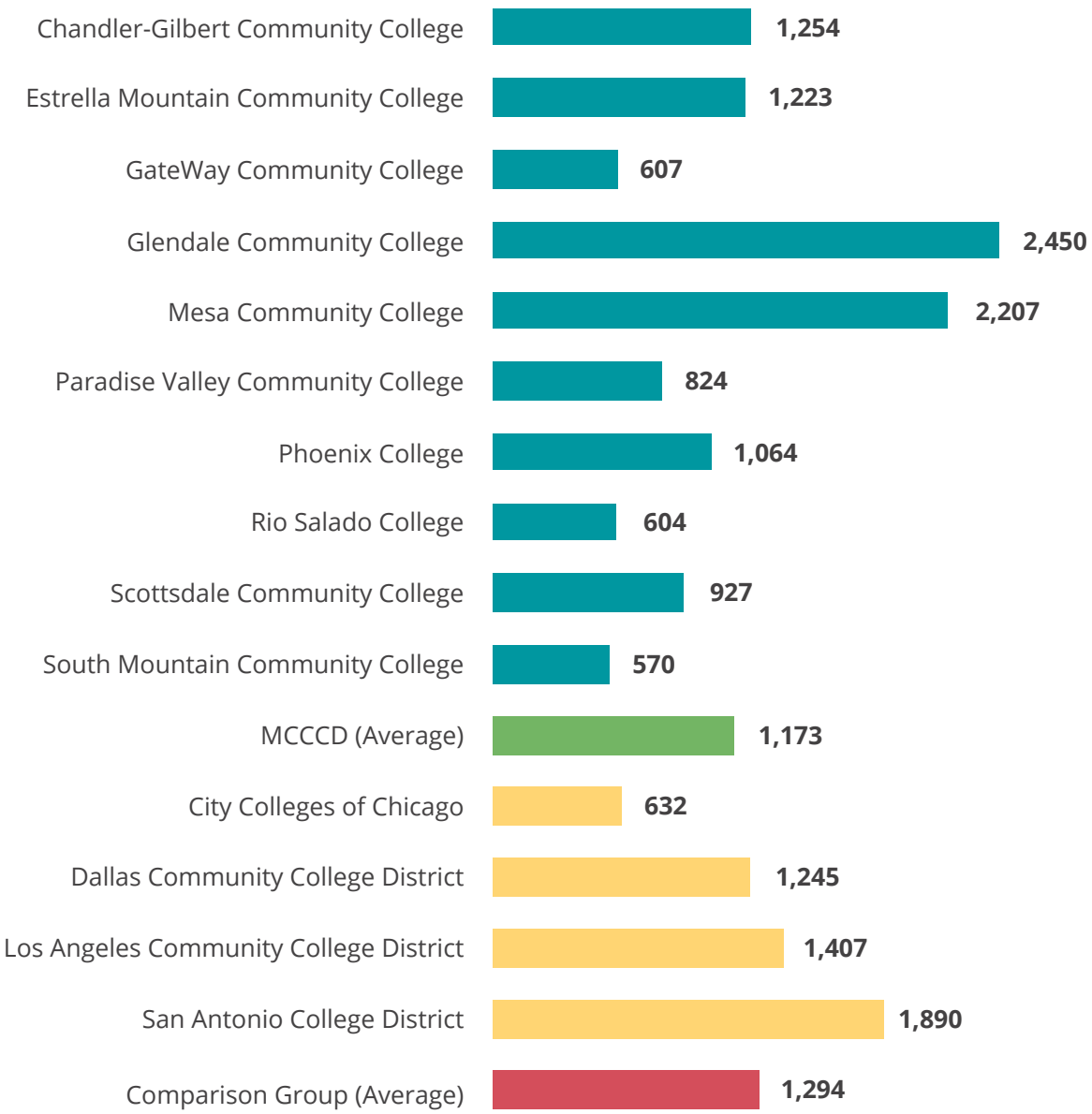
When looking at transfer-out rates, Chandler-Gilbert Community College has the highest rate at 39% within the MCCCD. The highest transfer-out rate from the peer institutions is found at the San Antonio College District at 24%. Overall, the colleges within MCCCD have a considerably higher transfer-out rate than all of the peer institutions.

FIGURE 9.6 | GRADUATION VS TRANSFER RATE, OVERALL, FIRST-TIME DEGREE/CERTIFICATE-SEEKING UNDERGRADUATES: 2015 COHORT



Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) 2019

FIGURE 9.7 | ASSOCIATE'S DEGREES AWARDED: 2017-2018



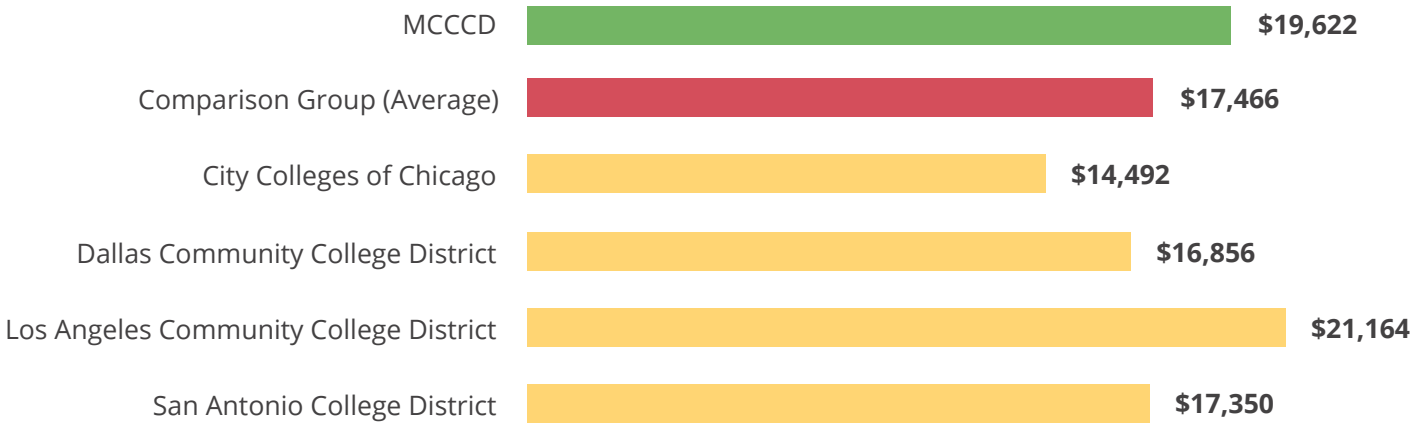
Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) 2019

ASSOCIATE'S DEGREES AWARDED

Figure 9.7 provides data on how many associate's degrees are awarded by each institution included in this study. In general, this data is used in conjunction with enrollment data to understand the overall size and breadth of each institution included in the study.

As indicated in the chart, Mesa Community College and Glendale Community College produce nearly twice as many associate's degrees as almost all of the institutions in the study. Only the Los Angeles Community College District and the San Antonio College district are comparable in size. In some cases, compared to the other colleges, Mesa and Glendale are producing nearly four times the number of associate's degrees as other institutions both within the MCCCD and the peer institutions.

FIGURE 9.8 | AVERAGE COST OF ATTENDANCE: 2018



Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) 2019

AVERAGE COST OF ATTENDANCE

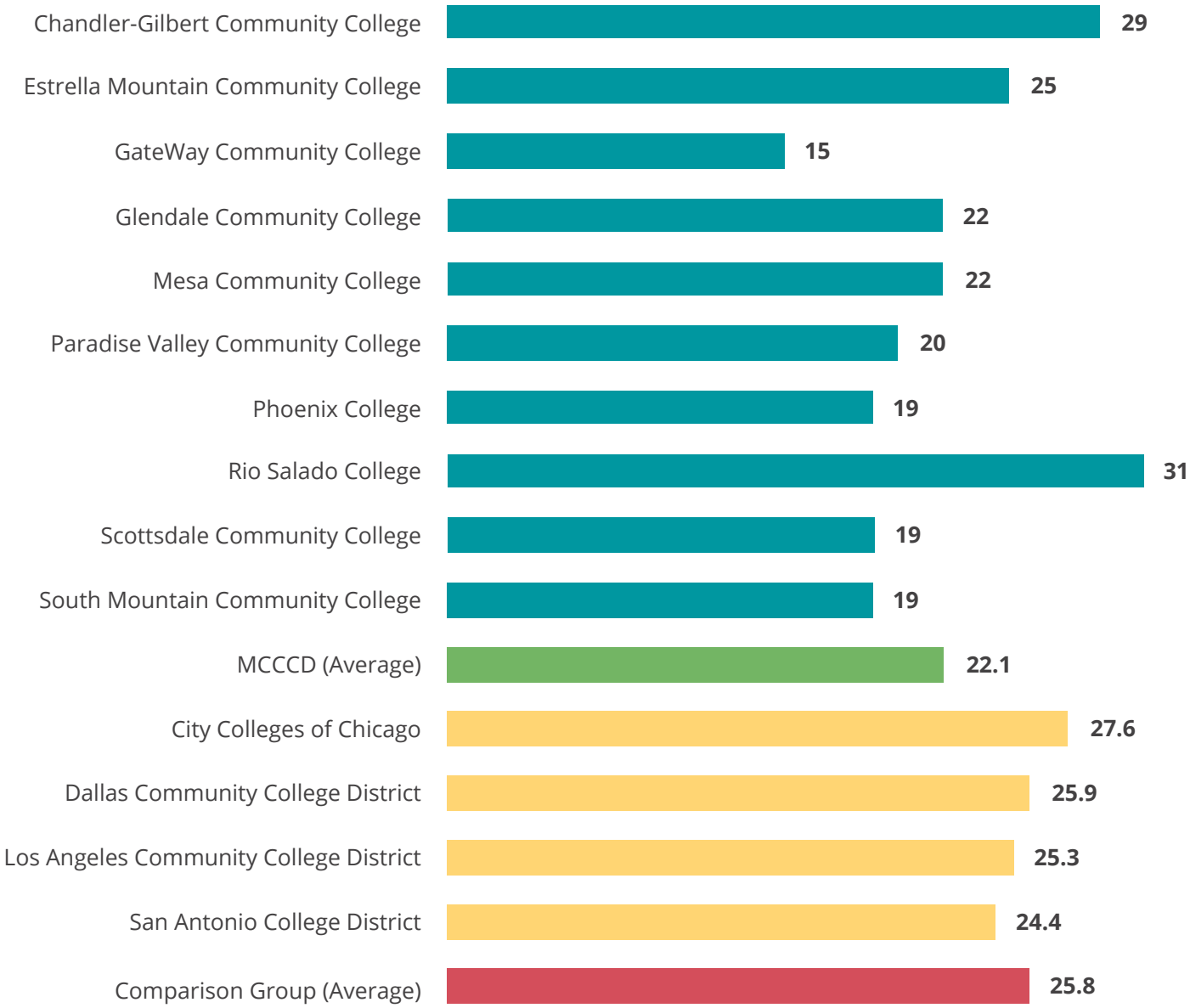
In Figure 9.8, the average cost of attendance data is shown. This cost is derived by considering the average costs for a student to attend the institution who lives off-campus and paying in-district tuition rates. Overall, the Los Angeles County Community College District has the highest attendance rate at $21,164 per year. MCCCD had an average cost for an academic year in 2018 of $19,622. The lowest average cost of attendance was found at the City Colleges of Chicago at $14,492.

FULL-TIME STUDENT EQUIVALENT (FTSE) PER FULL-TIME EQUIVALENT (FTE) INSTRUCTIONAL STAFF

Figure 9.9 provides data for each college in the benchmarking study comparing the FTSE per FTE instructional staff. This data consists of a ratio between the number of full-time student equivalent and full-time instructional staff. In essence, it is a calibrated measure of class size within each of the colleges in the benchmarking study. Student–instructional staff ratios in higher education significantly impact teaching and learning and critical financial implications for colleges. Data from research, in general, supports the idea that the smaller the student to instructional staff ratio, the better the quality of learning. However, this ratio must be balanced with financial efficiency for the institution to remain financially viable.

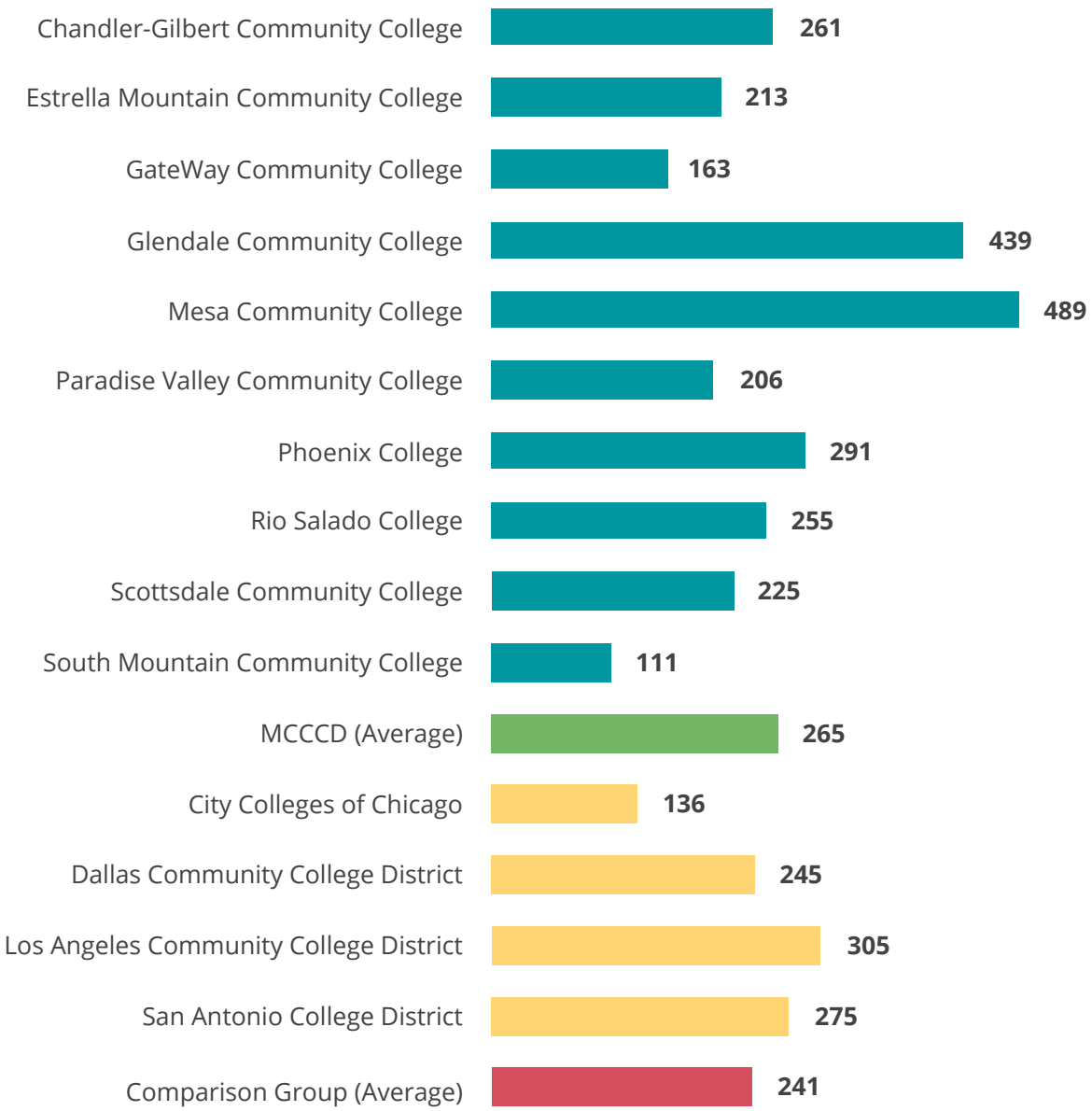
As noted in Figure 9.9, Rio Salado has the highest student to instructional staff ratio of all of the colleges compared in this study. However, it must be noted that because Rio Salado offers most of its instruction in an online format that class size has considerably less impact on the overall quality of instruction. Among the other MCCCD colleges, Chandler-Gilbert has the highest ratio at 29, and the lowest ratio is found at GateWay Community College at 15. Among the peer institutions, City Colleges of Chicago has the highest ratio at 27.6, and the San Antonio College District has the lowest at 24.4. Overall, the average MCCCD ratio at 22.1 is considerably lower than the peer institutions' average at 25.8 by nearly four students.

FIGURE 9.9 | FTE STUDENTS PER FTE INSTRUCTIONAL STAFF: 2018



Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) 2019

FIGURE 9.10 | NUMBER OF FTE POSTSECONDARY INSTRUCTIONAL STAFF: FALL 2018



Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) 2019

FTE INSTRUCTIONAL STAFF

The data in Figure 9.10 aggregates full-time and part-time instructional staff into a full-time equivalent value. The FTE measure is generally used in academic institutions to compensate for the variety of contracts that exist. In some cases, faculty have a 9-month contract, and in other instances, they may have a 12-month contract. The FTE calculation provides a comparable metric when looking at instructional needs across a variety of colleges.

As noted in Figure 9.10, Mesa Community College has the highest number of FTE instructional staff at 489, and South Mountain Community College has the lowest number of FTE instructional staff at 111. Among the peer institutions, the Los Angeles Community College District has 305 FTE instructional staff, and the City Colleges of Chicago has the lowest number of FTE instructional staff at 136. Overall, the MCCCD average of 265 FTE instructional staff is about 10% larger than the 241 FTE instructional staff average for the peer institutions.

CHAPTER 10 ENROLLMENT & CAPTURE RATE ANALYSIS

FOCUS AREA:

This section of the environmental scan examines historical enrollment trends for each college over the last five years. Also examined in this section is an analysis of the capture rates for the Maricopa Community College District for the last 40 years. This data can be helpful in understanding the different effects that specific events have on the overall enrollment for each campus by correlating it to chronological events that have occurred.

QUESTIONS FOR THIS FOCUS AREA:

- As enrollment rates continue to decline, what strategies need to be implemented at the campus level through the facility master plan that could help turn this trend around?
- As enrollment rates continue to decline, what strategies need to be implemented at the campus level through the facility master plan that could help turn this trend around?

HISTORICAL ENROLLMENT ANALYSIS BY CAMPUS

A fall 45-day student headcount and FTSE data for the 10 Maricopa County District Colleges was obtained from the Maricopa Community College District Office of Institutional Effectiveness. As noted in Table 10.1, headcount data for SMCC is illustrated for a five-year period from Fall 2013 to Fall 2018.

WHAT ARE THE KEY TRENDS?

Full-time student equivalent (FTSE) enrollment is provided for two time periods. Overall, district FTSE declined 11.7% between Fall 2013 and Fall 2018. Student headcount enrollment has also trended downward since 2013.

The "% of Total Enrollment" row is the percentage of the district's total FTSE generated from each college. For example, in 2013, 13.1% of district FTSE enrollment was generated at Chandler-Gilbert College for the Fall 2013 semester. Between 2013 and 2018, Estrella Mountain College has increased its percentage of district-wide enrollment or market share by 1.9%, while GateWay College declined by 1.2%.

Districtwide, the FTSE to Headcount ratio was down from 0.47 in 2013 to 0.46 in 2018. In 2013, each student, on average, generated 0.47 FTSE. The average is greatly impacted by the low ratios at Rio Salado College. Chandler-Gilbert had the greatest change between the two time periods.

TABLE 10.1 | ENROLLMENT TRENDS BY INSTITUTION, FALL 45TH DAY HISTORICAL FTSE: FIVE-YEAR TREND

COLLEGE	FALL 2013 FTSE	FALL 2013 % OF TOTAL ENROLLMENT	FALL 2013 FTSE TO HEADCOUNT RATIO	FALL 2018 FTSE	FALL 2018 % OF TOTAL ENROLLMENT	FALL 2018 FTSE TO HEADCOUNT RATIO
Chandler-Gilbert	7854	13.1%	0.55	7406	14.0%	0.50
Estrella Mountain	4569	7.6%	0.52	5058	9.5%	0.51
GateWay	11218	18.7%	0.54	9278	17.5%	0.52
Glendale	2749	4.6%	0.43	2324	4.4%	0.46
Mesa	12026	20.0%	0.51	10293	19.4%	0.50
Paradise Valley	6338	10.5%	0.50	5410	10.2%	0.49
Phoenix	4642	7.7%	0.49	3769	7.1%	0.46
Rio Salado	3355	5.6%	0.16	3432	6.5%	0.19
Scottsdale	5058	8.4%	0.49	3989	7.5%	0.46
South Mountain	2335	3.9%	0.49	2114	4.0%	0.52
District Total	**60,144**	**100.0%**		**53,073**	**100.0%**	
Campus Average	**10,935**		**0.47**	**9,650**		**0.46**

PARTICIPATION OR CAPTURE RATES

Participation or capture rates were calculated at the district level for the Colleges' primary, secondary, and outside service areas. Participation or capture rate can be defined as the percent of the total population enrolled or "participating" in higher education in a given area. In this case, participation is enrollment in credit courses and programs related to headcount enrollments for the ten colleges in the district. For this analysis, all students regardless of county of residence, were considered in the analysis. The participation rate is expressed as a percentage as noted in the formula:

$$\text{Participation Rates} = \frac{\text{(Headcount)}}{\text{(Zip Code Population)}} \times 100$$

It should be noted further that only credit headcount enrollment was used in the analysis.

The national average participation rate for public two-year colleges varied between 1.81% and 2.24% between 2012 and 2016, with the lowest rate of 1.81% in 2016. In Arizona, the rate was 2.71% in 2016. Most states have similar methods of calculating participation rates; however, some used selected age groups (such as ages 16 to 64) as the population base. As a point of comparison, the capture rate in California in 2016 was 3.27%, while in Texas, the rate was 2.49%, based on data provided by the U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Spring 2016/Fall 2017 Enrollment component.

Table 10.2 notes headcount trends in relationship to Maricopa county population from 1980 through 2019. Population data was obtained from the Office of Employment and Population Statistics, Arizona Department of Administration. In reviewing the table, district headcount enrollment was divided by the total population of Maricopa county. For example, for fall 2019, the MCCCD had a total headcount of 114,775 students. The total population of Maricopa County was 4,367,835 residents, resulting in a participation rate of 2.6%. In other words, 2.6% of the population of Maricopa County was enrolled in district colleges for Fall 2019.

WHAT ARE THE KEY TRENDS?

A general trend has been the increase in county population over the last 40 years. Rates remained stable, with an average of 3.9% until rates declined in 1996. Rates averaged 3.5% until 2006 when rates declined further. Participation rates peaked in 2010 at 3.7% and have been steadily declining through 2018. A significant drop is also noted between 2018 and 2019, with Fall 2019 being the lowest participation rates calculated in 40 years.

TABLE 10.2 | STUDENT HEADCOUNT TRENDS/PARTICIPATION RATES MARICOPA COUNTY COMMUNITY COLLEGE DISTRICT
FALL 45TH DAY HISTORICAL HEADCOUNT

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
County Population	1,515,700	1,568,700	1,612,000	1,642,300	1,718,700	1,814,700	1,911,600	1,990,800	2,035,500	2,116,500
District HC	60,798	59,315	63,084	65,077	63,582	65,829	71,664	78,008	85,551	89,369
Participation Rate	4.0%	3.8%	3.9%	4.0%	3.7%	3.6%	3.7%	3.9%	4.2%	4.2%

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
County Population	2,130,400	2,179,975	2,233,700	2,291,200	2,355,900	2,454,525	2,634,625	2,720,575	2,806,100	2,913,475
District HC	91,202	95,089	89,735	87,703	88,022	89,637	90,471	91,348	96,574	102,299
Participation Rate	4.3%	4.4%	4.0%	3.8%	3.7%	3.7%	3.4%	3.4%	3.4%	3.5%

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
County Population	3,096,625	3,192,125	3,296,250	3,406,170	3,537,630	3,681,300	3,792,675	3,907,492	3,987,942	4,023,331
District HC	105,890	109,770	117,522	119,727	123,274	123,865	122,073	118,665	120,096	131,584
Participation Rate	3.4%	3.4%	3.6%	3.5%	3.5%	3.4%	3.2%	3.0%	3.0%	3.3%

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
County Population	3,824,058	3,843,370	3,884,705	3,944,859	4,008,651	4,076,438	4,137,076	4,221,684	4,294,460	4,367,835
District HC	141,704	139,979	137,982	132,877	128,212	126,204	120,686	120,326	118,311	114,775
Participation Rate	3.7%	3.6%	3.6%	3.4%	3.2%	3.1%	2.9%	2.9%	2.8%	2.6%

EXTERNAL INFLUENCES ON PARTICIPATION RATES

Participation or capture rates are broad-based parameters of the ability of a college to successfully recruit residents from a given geographic area. These rates are also used by marketing and development offices and are often used as an indication of market penetration. Their use is almost exclusive to community colleges where students attend while living at home and/or working in the surrounding community. As noted in the beginning of this report, the national average participation rate in 2016 was 1.81% while the Arizona rate was 2.71%.

Based on this study, the District's participation is higher than the national average, but slightly lower than the state average. The consultants are not aware of any national studies or research that describes specific influences on this measure. Based on personal experience and work with other community colleges, the consultant notes that rates can be influenced by a host of factors including educational attainment and age characteristics of the geographical area, competition, and program offerings. More difficult to measure concepts could include the image or reputation of the college in the community.

The proprietary education sector also has an influence on participation rates. A review of enrollment data found that only 10,031 students were attending two-year private for-profit colleges in the state in 2018.

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