

## Conditions Report L.A. County, California 2010-2019

### Executive Summary

Los Angeles County has a diverse make up with about half of the population being Hispanic and the second largest minority group being Asian. Both the general population and Hispanics show a lower number of people between the ages of 5 and 24 years than 25 to about 44 years. This normally would suggest a lower fertility rate; however, migration patterns show that more than half of the people born in L.A. County between 2010 and 2019 left. A little less than half died and just about a quarter of the number of births immigrated providing population growth. The high representation of young professionals (age 25-44) is possibly due to immigration for the L.A. County job market. The high emigration is possibly due to the high housing prices.

Information technology, arts and entertainment, and transportation and warehousing are major export industries in L.A. County. The health care industry is emerging quickly. Manufacturing, construction, forestry, fishing, and mining are among the weaker industry sectors.

The overall unemployment rate for L.A. County is 4.6%, 0.4% higher than the state California and 0.9% higher than the U.S. national average as of 2019. Unemployment rates in L.A. County are highest for Black or African Americans (8%). These are most likely that high since Blacks or African Americans used to historically hold manufacturing jobs, which gradually disappeared. Blacks or African Americans, however, have a 90.1% rate of high school degrees and a 27.9% rate of bachelors. Hispanics have only a 63% high school degree rate and 13.6% bachelor's degree rate. Yet Hispanics have a lower unemployment rate (5.2%) than Blacks or African Americans. Whites and Asians have unemployment rates of 4.7% and 3.8% respectively, however, they have high school degrees at about 90-95% and bachelor's degrees at about 53%. Clearly, the job market demand is shifting away from manufacturing and for minority groups like Blacks or African Americans and Hispanics to keep up with minorities like Asians or non-minorities like Whites, they have to increase their competitiveness and attain higher rates of bachelor's degrees. An alternative path for unemployed people of minority groups is the pursuit of a trade school career. The medical and nursing, cosmetology and barbering, legal and criminal justice, audio-visual technology, and transportation logistics are high in demand and offers more job stability than manufacturing and construction.

The number of transportation commutes have been growing for commute times over 30 minutes and have been decreasing for commute times less than 30 minutes. Driving alone and working from home has increased, and public transport and car-pooling has decreased. It seems urban sprawl and resulting traffic congestions are the main driving factors for increased commute times. Buses have to share lanes with cars and there are more cars because of the sprawling housing market. L.A. Counties bus system is already nationally ranked at the top. So, expanding the bus system might not help much, also since 2014 bus ridership has been constantly decreasing. There is, however, an opportunity to solve traffic congestion and long commute times by upgrading rail infrastructure since commuter and heavy rail rank place 8 and 9 nationally. If the rail system would be upgraded to rank at the top nationally like the bus system,

as it should since L.A. County has one of the nation's highest population numbers, it would alleviate the street traffic system.

A new approach to housing construction can also help to reduce traffic congestions by building denser housing at major job locations. This would also benefit the renter- and owner-occupied housing market tremendously since L.A. County is in desperate need of more affordable housing. Denser housing is usually more affordable because of the higher unit count per square feet. Specifically, there is about a 275,000-housing unit deficit for renters below \$26,466 household income and a 145,000-housing unit deficit for the owner-occupied units below \$34,999 household income. It is estimated that about 220,000 new housing units are going to be built between 2019 and 2040 which could if built affordable, alleviate the affordable housing crisis in L.A. County. By no means would that solve the affordable housing crisis all at once since there are high unit deficits for higher income ranges as well, but it would be a step in the right direction. The speculative real estate market has to be also taken into account. This means that developers and landlords keep rent prices high or off the market until the price increases for higher profits. Potential solutions for vacancy and affordable housing are a vacancy tax penalty and less restrictive limitations on condominium ownership, as well as less restrictive demolition policies. As mentioned before if that new housing would be dense and at major job locations, in combination with rail transit improvements and accessibility, the high commute times and non-affordable housing issues could get better. Besides that, it might also decrease the number of emigrations since a major factor of young people leaving L.A. County are high costs of living.

## Introduction

A current conditions analysis is important for public officials to know in which direction policy decisions have to be made. L.A. County has a diverse population with about half of the people from Hispanic or Latino origin. Between 2010 and 2019 Los Angeles County lost about half of the people born, to emigration and the other half to natural death. Only about a quarter of the people born are coming in by international immigration. Housing and rental prices are increasing dramatically. Population pyramids suggest low fertility rate which for Hispanics; however, are higher than for the general L.A. population. Could a lower fertility rate and substantial domestic emigration in combination with high housing costs translate to, young families leaving and causing a lower percentage of people below 25 years than people above 25years?

Information technology, arts and entertainment, and transportation and warehousing are strong export industries in L.A. County. Manufacturing, construction, forestry, and fishing are weaker industries. The health care industry is promising to become a future export industry. Blacks and African Americans see substantially higher unemployment rates than other groups even though their education attainment looks quite good in comparison. Why? Could trade school be a solution for unemployment among minorities?

Los Angeles County has seen an increase in commute times above 30 minutes even though the average distance to works has almost not changed between 2010 and 2019. This could suggest urban sprawl. Furthermore, public transportation participation has dropped. Could this be due to urban sprawl? The rail system is lacking behind which could, when upgraded, resolve longer commute times in the future.

Housing has seen dramatic increases in homes valued over \$500,000 and rents over \$1000. About 275,000 rental units are in deficit for affordable housing and about 145,000 owner-occupied units are in deficit for affordable housing. 7% of the housing stock is vacant but 70% of it are due to rentals not being rented and other reasons. What are these other reasons? Can government policy resolve the affordable housing crisis?

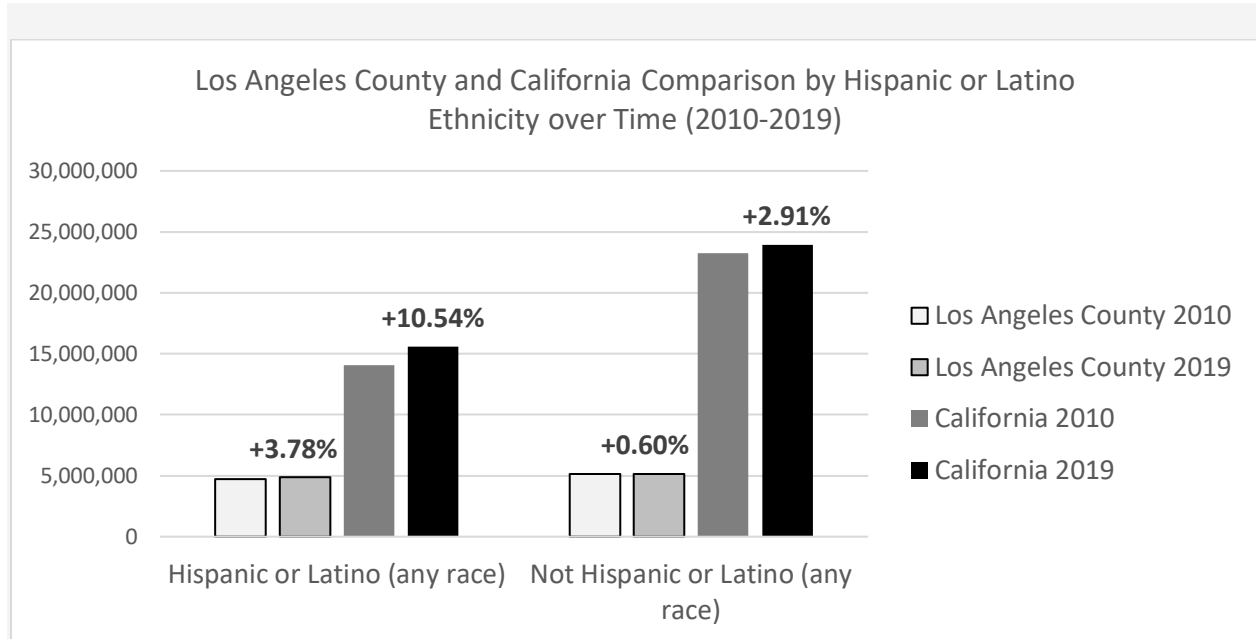
## Demographic Conditions & Trends – Project 1

Los Angeles County, California, residents are leaving. Los Angeles County has experienced substantial domestic emigration, and only about half of the people leaving are coming in by international immigration. However, a high number of births keeps the population growing slowly. Average household sizes are decreasing, and population growth is slowing down. The number of children is decreasing and the number of people above 65 years is increasing. Could this all be due to rising housing costs? Although the Hispanic community's population patterns are similar to the general population in Los Angeles County, suggested migration patterns aren't as strongly pronounced.

### Demographic Characteristics

The population in Los Angeles County and California grew between 2010 to 2019, as shown in Figure 1. About half (48.6%) of the population in L.A. county is Hispanic or Latino, and 39.4% are Hispanic or Latino in California in 2019. This makes the Hispanic or Latino ethnicity the largest minority group in Los Angeles County and California overall.

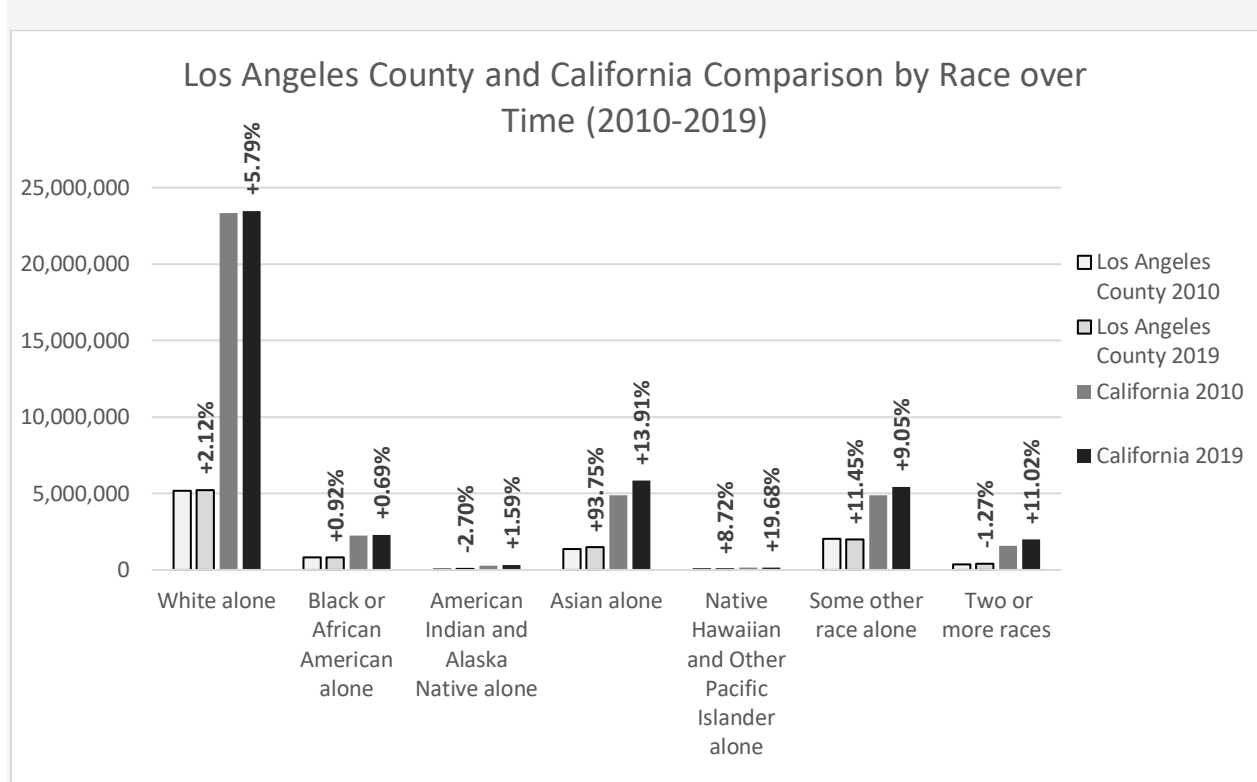
Figure 1: Hispanic or Latino Population Share



Source: U.S. Census Bureau, American Community Survey 1-year Estimates, 2010, 2019. Table DP05. Figure 2 compares the percentage of race for California and Los Angeles County with the percentual change from 2010 to 2019. The population of American Indians and Alaska Natives in L.A. County has almost doubled between 2010 and 2019. However, they make up only a tiny part of the overall population. The Black or African American population has been declining in L.A. County but increasing in California overall. Native Hawaiian and other Pacific Islanders have grown slightly in L.A. County and California. Asians have increased slightly in L.A. County and grown by one-fifth in California. Asians make up for the largest minority race in

L.A. County and California. Whites have remained steady with minimal increases in L.A. County and California between 2010 and 2019.

Figure 2: Comparison by Race over Time

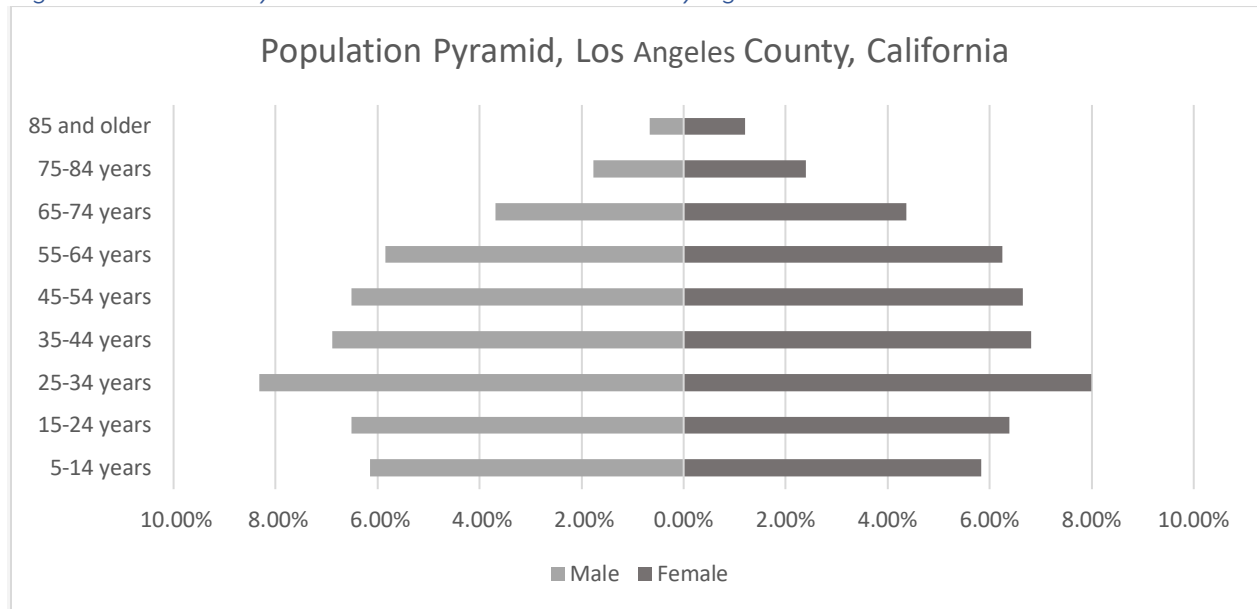


Source: U.S. Census Bureau, American Community Survey 1-year Estimates, 2019. Table B02001.  
 Source: U.S. Census Bureau, American Community Survey 1-year Estimates, 2010. Table B02001.

### Male and Female Population Share

The age distribution for 25 years and up looks like a regular pyramid, as shown in Figure 3. However, the population between 15 to 24 years is about the same as between 45 to 54. The population between 5 to 14 years is about the same as 55 to 64 years for Los Angeles County, California, in 2019. This could indicate a low fertility rate, people leaving once they have kids, or inward migration at about 25 years and older. The population pyramid is roughly balanced for both sexes; only the typical decrease in males due to average life expectancy for years 55 and up can be observed.

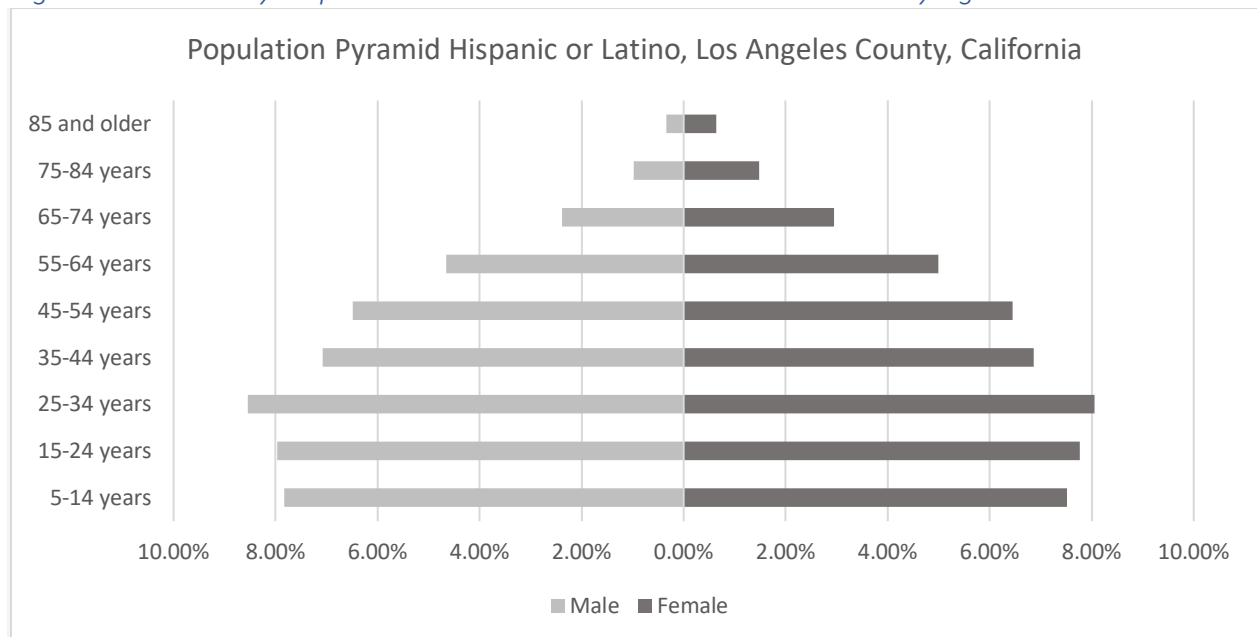
Figure 3: L.A. County Male and Female Distribution by Age



Source: US Census Bureau, ACS 1-Year Estimate, 2019. S0101.

Observations in Figure 4 show that the Hispanic or Latino ethnicity follows the general population trend of Los Angeles County. However, for them, the fertility rate is higher. Both population pyramids show a slightly higher percentual share of males below 45 years, which might be due to the job market. There is also a higher percentage of females above 55 years, indicating typical male versus female mortality tendencies.

Figure 4: L.A. County Hispanic or Latino Male and Female Distribution by Age



Source: US Census Bureau, ACS 1-Year Estimate, 2019. B010011.

Housing Factors

According to "California population growth slowest since 1900 as residents leave, immigration decelerates" article in the L.A. Times, most young people leave once they want to settle down for a family because of the high housing costs (Barajas & Parvini, 2019). Figures 5 and 6 confirm the higher housing cost and the rising housing prices. Figure 5 shows the growth of home values in Los Angeles County, California. Figure 6 shows the growing rents for Los Angeles County. Both graphs indicate that Los Angeles County's affordable housing options diminish faster than the United States national average. This also explains the lower population for ages below 25 in figures 3 and 4. Young families emigrate (Barajas & Parvini, 2019).

Figure 5: U.S. vs. L.A. County Home Value

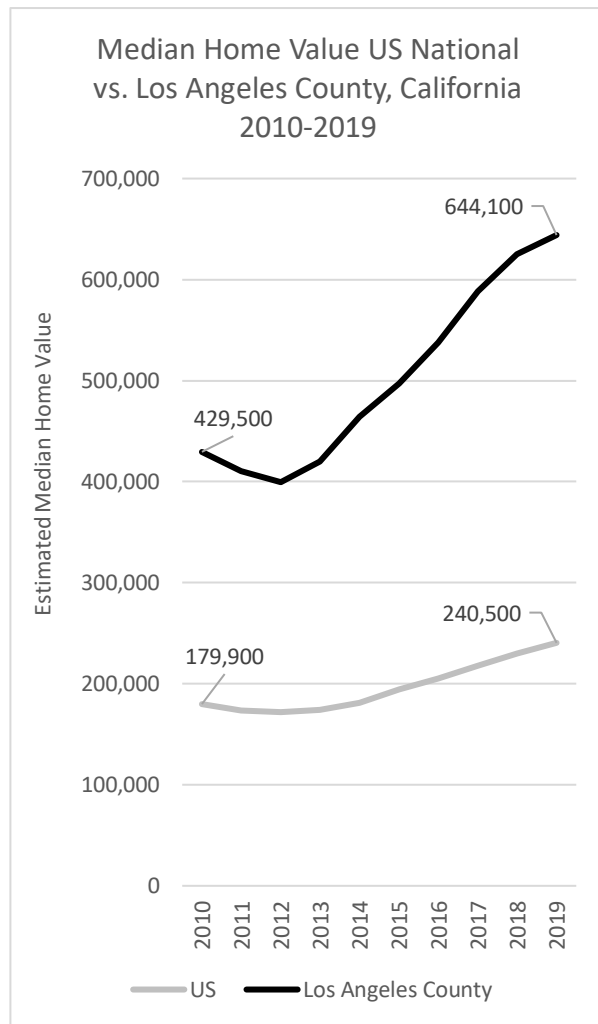
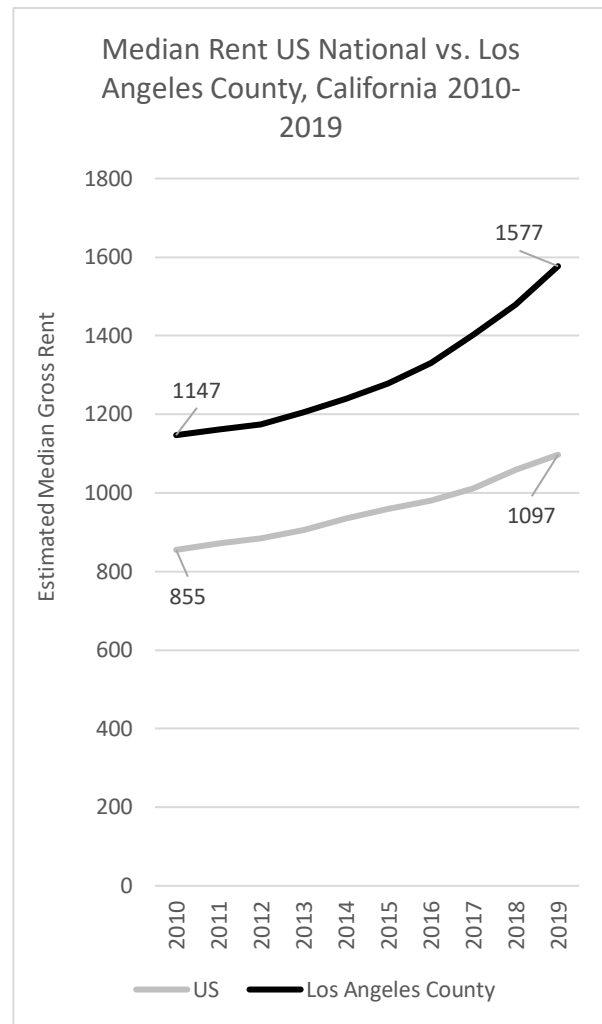


Figure 6: U.S. vs. L.A. County Rent

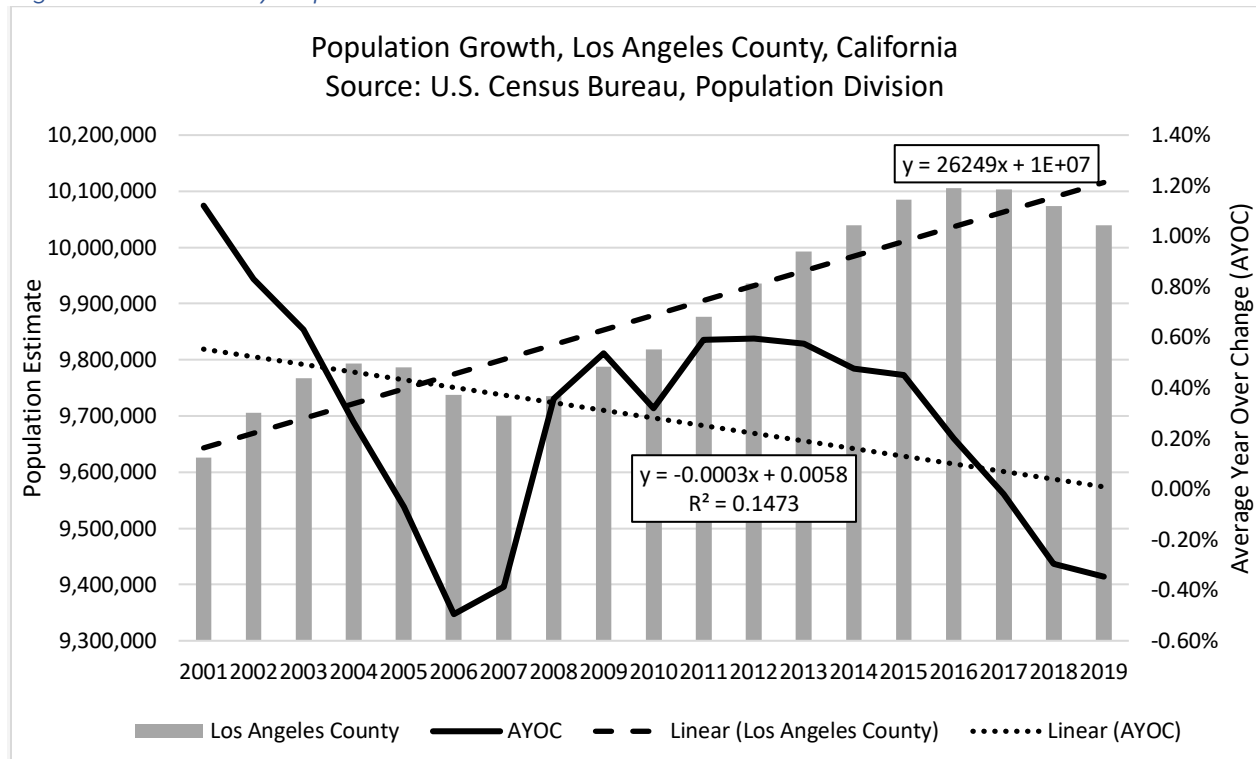


Source: U.S. Census Bureau, American Community Survey 1-year Estimates, 2010-2019. Table DP04.

Population Trend Analysis

The growth trend for Los Angeles County, California, between 2001 and 2019 is extremely volatile ( $R^2 = 0.147$ ), as shown in Figure 7. This means there is no stable growth trend, indicating possible fluctuations. The average year over change and average annual rate of change are both 0.28% (exact calculation in appendix), which means the population is growing slowly. The average year over change trendline slope is negative (-0.0003), meaning the population growth is slowing down.

Figure 7: L.A. County Population Trend

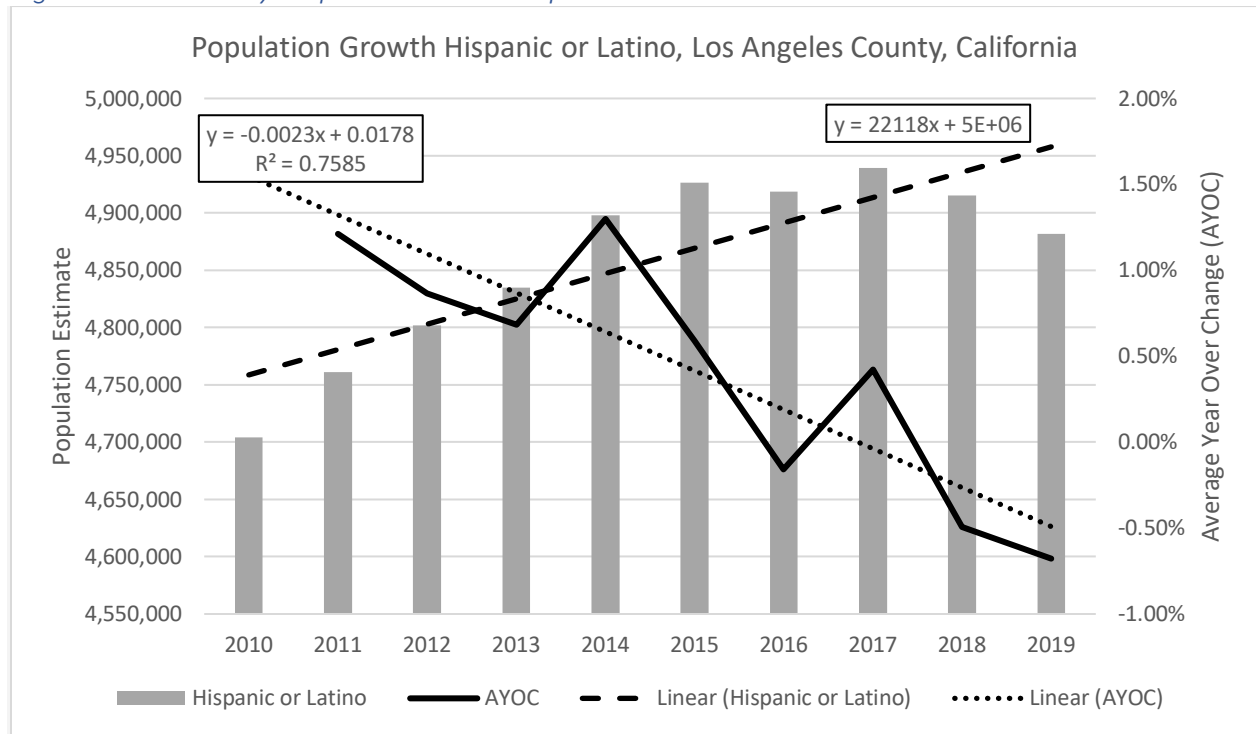


Source: Table 1. Intercensal Estimates of the Resident Population for Counties of California: April 1, 2000 to July 1, 2010 (CO-EST00INT-01-06)  
Annual Estimates of the Resident Population for Counties in California: April 1, 2010 to July 1, 2019 (CO-EST2019-ANNRES-06)

Figure 8 shows that Hispanics' or Latinos' growth trend is steady ( $R^2 = 0.759$ ) in Los Angeles County, California, between 2010 and 2019. The average year over change and average annual rate of change are both about 0.42% (exact calculation in appendix), which means the population is growing slowly. The slope of the average year of change trendline is negative (-0.0023), meaning the population growth is slowing down, as well, following L.A. County's trend. In both cases, for the general population of L.A. County and the Hispanic or Latino population in L.A. County, the population, however, started to decline in 2017.



Figure 8: L.A. County Hispanic or Latino Population Trend



Source: US Census Bureau, ACS 1-Year Estimate, 2010-2019. Table B010011.

### Population Forecast 2040

The projected population is 10,613,614 for Los Angeles County, California, in 2040 (exact calculation in appendix). The population was projected by using a linear method since it is recommended for large populations with about 5 to 15 percent population growth, according to Rayer (2008). Los Angeles County had a population of 10,073,907 in 2019 with a population growth of 5.5% between 2000-2019.

The average household size is projected to be 2.94 people for Los Angeles County in the year 2040 (exact calculation in appendix). This equals 3,612,660 (10,613,614/2.94) projected households in 2040 which are 221,009 (3,612,600 – 3,391,591) new households as compared to 2019 (10,039,107 /2.96). The average household size was 2.98 in 2000, 2.98 in 2010, and 2.96 in 2019. While the average household size is shrinking, Figure 7 shows population growth is slowing down, as well.

### Dependency Ratios

Table 1 shows that about half of the population in California is dependent on the working population (15-64 years). Los Angeles County shows a similar figure, with about 47% being dependent on the working population. In California, the population share of children (0-14 years) is about 28%, and the population share of old age (65+ years) is about 22% when compared to the working population (15-64 years); Los Angeles County has two percentage points less for both categories. For L.A. County, between 2010 and 2019, the child dependency ratio decreased by two percentage points and the old-age dependency ratio increased by almost five percentage

points; overall dependency increased by two percentage points. A closer look at the data from the American Community Survey 1-year estimates for 2010 and 2019, table S0101, reveals that the population of people under 15 years declined by about 174,221, people between 15 and 64 years have increased by about 40,668, and people over 64 years have increased by about 332,409 in L.A. County. This shows that the workforce age has increased and perhaps settled down, whereas it seems that young families with kids seem to decrease and perhaps leave. The low increase of the workforce age compared to child and old age also seems to suggest population replacement of families with kids by people in in the working-age (15-64 years) without kids.

Table 1: Dependency Ratio

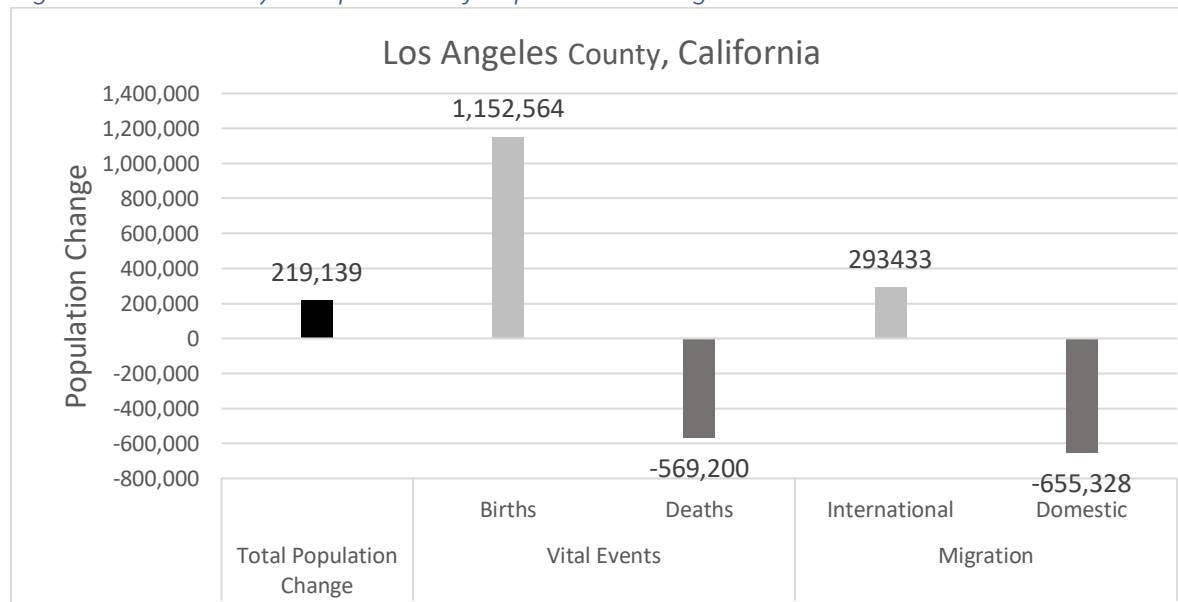
Dependency Ratio	California 2019	Los Angeles County 2010	Los Angeles County 2019
Child Dependency Ratio	28.10%	28.76%	26.04%
Old Age Dependency Ratio	22.20%	15.90%	20.66%
<b>Age Dependency Ratio</b>	<b>50.30%</b>	<b>44.65%</b>	<b>46.70%</b>

Source: U.S. Census Bureau, American Community Survey 1-year Estimates, 2010, 2019. Table S0101.

### Components of Population Change

Los Angeles County, California, had a net gain of 219,139 people between 2010 and 2019. As shown in Figure 9, about 1.15 million people were born, and 569,000 people died. L.A. County had a net gain of 293,000 from international migration and a net loss of 655,000 from domestic migration. As mentioned earlier, this pattern suggests that people at a young age tend to leave (Barajas & Parvini, 2019), and people in the middle ages most likely tend to migrate toward L.A. County. This would explain figure 3 and 4's higher percentage of people at 25 years and up than people below 25 years.

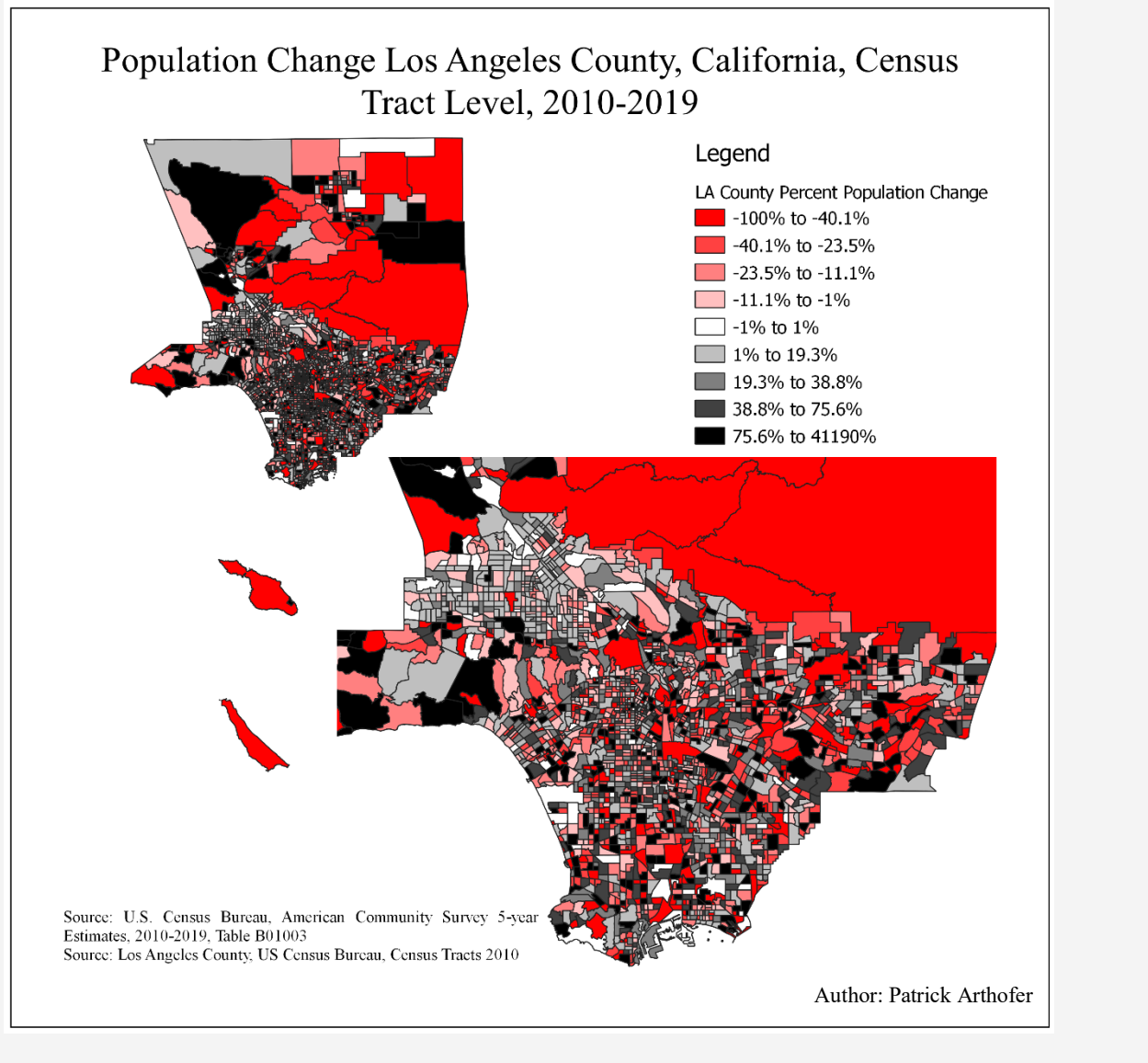
Figure 9: L.A. County Components of Population Change



Source: Source: U.S. Census Bureau, Population Division. Estimates of the Components of Resident Population Change for Counties in California: April 1, 2010 to July 1, 2019 (CO-EST2019-COMP-06)

Strong migration patterns can also be seen on Map 1. In general, the population declined in less dense areas, with a few exceptions, between 2010 and 2019. Urban areas have mixed population changes between 2010 and 2019.

Map 1: Population Change Los Angeles, California, 2010-2019



## Economic Conditions & Trends

The economic analysis looks at increases and decreases of local industry, whether industry is importing or exporting, labor participation rates, unemployment rates, and educational attainment. Information technology, arts and entertainment, and transportation and warehousing are top exporters in L.A. County. The unemployment rate of Blacks or African Americans is substantially higher than of other groups even though educational attainment is quite good. It is suggested that Blacks and African Americans traditionally have worked in manufacturing and constructions jobs, which are both heavily declining fields in LA. County. Blacks or African Americans have low bachelor's degree attainments, which could explain their higher unemployment rates. However, the availability of trade schools provides an opportunity for unemployed Blacks or African Americans to transition from their traditionally held construction or manufacturing jobs. The health care sector is a promising industry which is likely to become an exporter in recent years.

## Economic Development

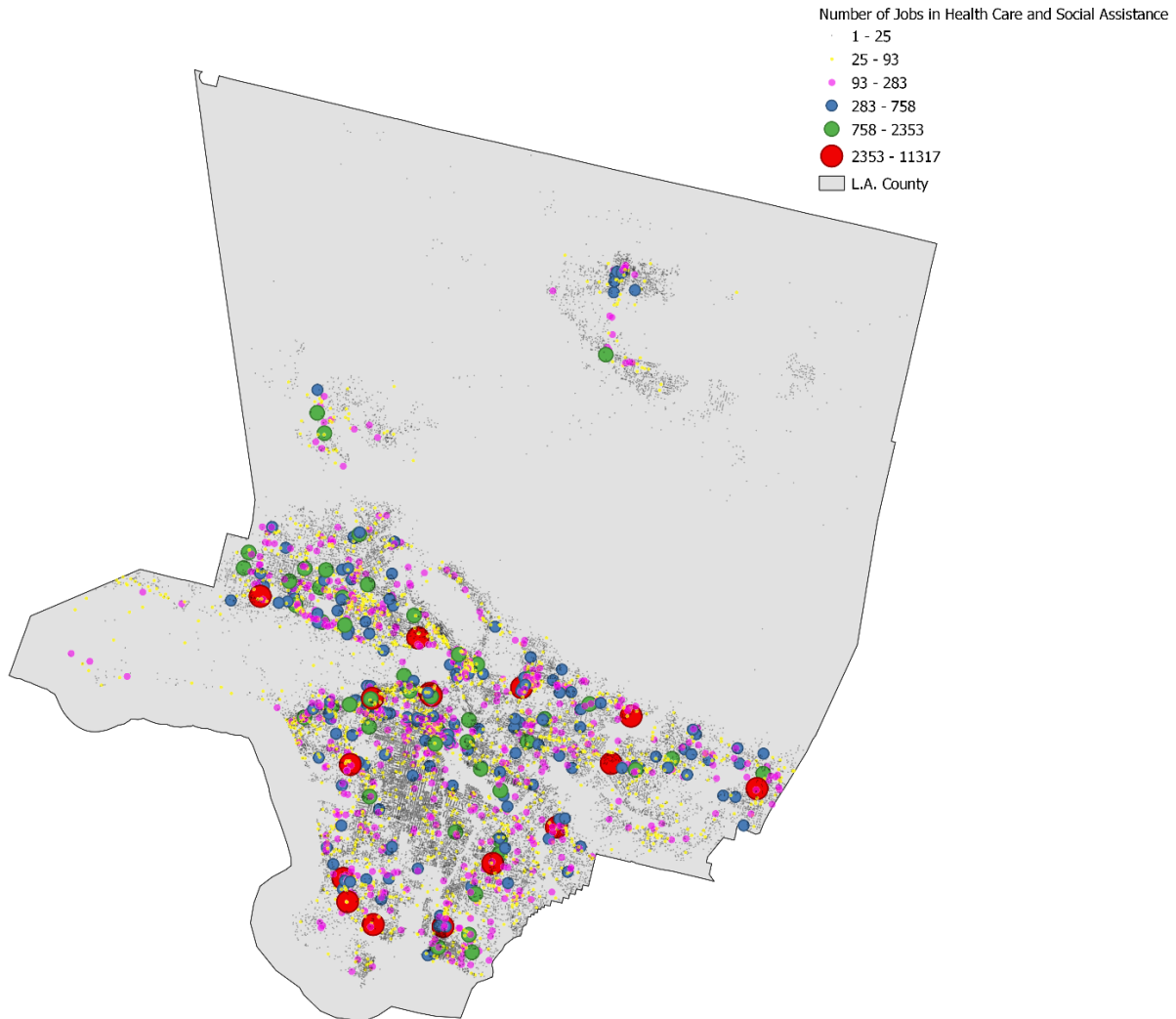
An economic development analysis in a region looks at two critical measurements to better understand the current conditions: location quotient, and local shift share. The location quotient compares the relative regional employment (L.A. County) share in an industry to the relative national (U.S.) employment share in that industry. A ratio above 1.25 indicates that this industry is producing more than the regions needs and can therefore export the produce. A ratio below 0.75 indicates a lack in local production, which means this industry needs to import products to satisfy the local market. Anything between 0.75 and 1.25 is considered enough production to cover the local market demands for a specific industry. Local shift share looks whether the local employment has increased or decreased in a certain period (2010 to 2019 for this report). More details for the calculations can be found in the appendix.

According to the location quotient Los Angeles County has only three industries that could be considered as exporters (information technology, arts and entertainment, and transportation and warehousing), as seen in Figure 10 and Table 2. LA. County has about double the amount of import industry than export (forestry and fishing, mining, utilities, construction, federal civilian, military, and state government). The shift share analysis shows that LA. County has about 15 locally growing industries and 10 declining industries. From the locally growing industries the majority (eight) is classified as emerging and seven are already well established (stars), According to the local shift and location quotient analysis (Figure 10 & Table 2). From the 10 industries that are locally declining three are classified as vulnerable and the other seven are lagging. The industries that seem to do best are arts and entertainment, health care, education, real estate, information technology, and transportation. Among the industries doing the worst are forestry and fishing, mining, military, and federal civilian.



Map 1. Concentration of Health Care Jobs

## Number of Jobs for Health Care and Social Assistance in Los Angeles County, California, 2018.



Author: Patrick Arthofer. Source: Census Bureau OnTheMap, Work Area Profile Analysis. 2018.

As shown in Table 2, heavy industry in mining, quarrying, and oil and gas extraction has seen severe losses in wage and employment at a decline of more than 50% in both. Transportation, health care, military has also experienced losses in compensation but had mixed results for the change in the number of jobs. The greatest increase in real wages was observed for the industry of utilities, information technology, and state government with up to about \$23,000 for the compensations of utility jobs. Even though the real wage compensation decreased for health care, as mentioned earlier, it has seen the biggest growth of employment between 2010 and 2019. Interesting to notice would be that utilities and state government are according to the location quotient analysis classified as import and information technology as export.

Table 2: Job Compensation, Employment, Local Shift Share, and Location Quotient – Sorted by Location Quotient 2019

Industry Sector	Compensation Per Job 2019	Real Wage Change (2019-2010)	Employment 2019	Employment Change (2019-2010)	Local Shift Share 2010 - 2019	Location Quotient 2019
Information	\$133,022.62	\$18,381.36	259,544	26,766	8,852	2.28 (export)
Arts, entertainment, and recreation	\$49,654.30	\$2,904.81	269,617	71,472	15,059	1.69 (export)
Transportation and warehousing	\$45,196.67	- \$10,162.93	390,086	200,646	71,987	1.30 (export)
Wholesale trade	\$76,831.03	\$4,030.67	263,660	14,780	-5,751	1.23
Real estate and rental and leasing	\$20,687.96	\$2,405.83	390,464	91,260	8,513	1.21
Other services (except government and government enterprises)	\$25,119.72	-\$725.15	464,313	103,554	29,406	1.20
Professional, scientific, and technical services	\$75,006.32	\$3,353.59	543,836	107,130	-3,497	1.13
Health care and social assistance	\$51,073.41	-\$6,808.96	848,797	317,705	206,101	1.12
Educational services	\$54,938.71	\$3,649.57	171,427	27,154	2,205	1.09
Administrative and support and waste management and remediation services	\$41,842.67	\$6,842.39	419,698	66,308	-8,206	1.02
Accommodation and food services	\$32,901.09	\$5,340.40	494,940	145,442	48,793	0.99
Local government	\$111,048.62	\$9,130.72	461,329	11,308	2,592	0.97
State and local	\$110,575.21	\$10,001.58	560,255	30,599	20,460	0.86
Finance and insurance	\$77,948.79	\$208.86	305,273	46,925	-2,473	0.85
Management of companies and enterprises	\$118,137.53	\$2,775.98	77,502	19,125	-3,076	0.85
Retail trade	\$38,670.96	\$2,076.10	523,921	37,624	-4,246	0.84
Manufacturing	\$88,525.69	\$5,236.33	368,962	-31,050	-79,913	0.83
Government and government enterprises	\$110,168.48	\$9,774.75	625,486	24,895	23,337	0.77
Utilities	\$170,655.25	\$23,332.55	12,728	442	535	0.67 (import)

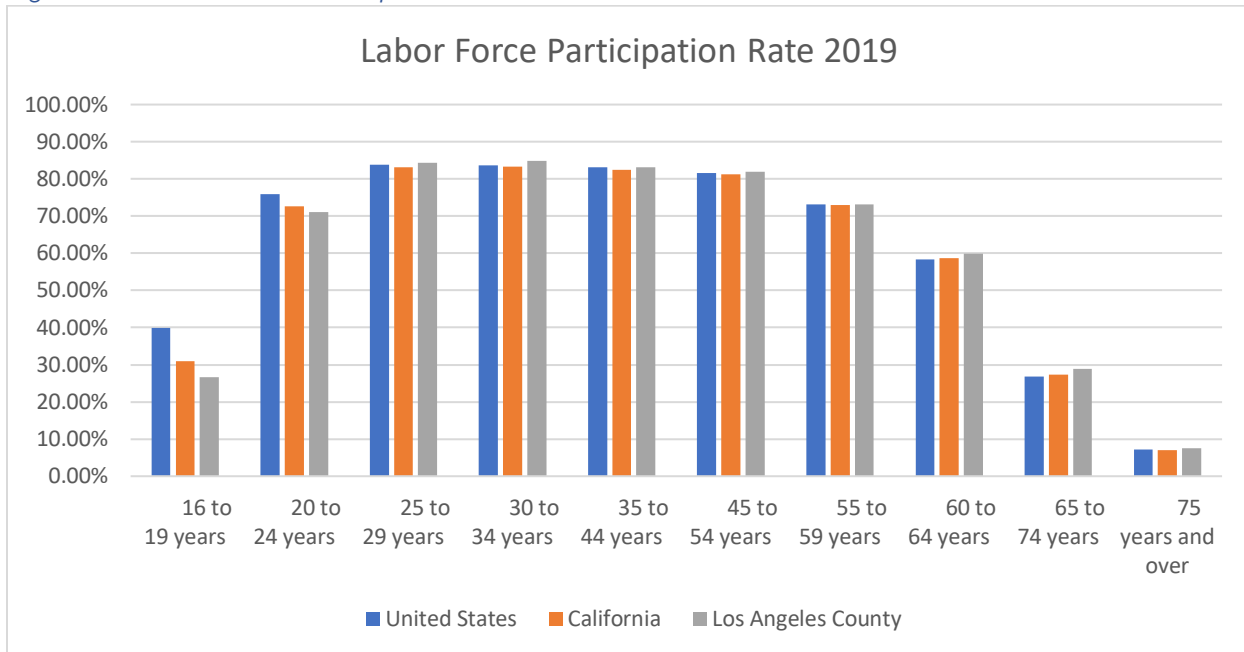
<b>Construction</b>	\$54,059.94	\$6,641.96	242,362	62,751	11,313	<b>0.65 (import)</b>
<b>State government</b>	\$108,367.52	\$15,390.48	98,926	19,291	17,814	<b>0.55 (import)</b>
<b>Federal civilian</b>	\$126,698.69	\$12,901.29	48,007	-4,571	-1,868	<b>0.51 (import)</b>
<b>Military</b>	\$50,865.13	-\$5,947.06	17,224	-1,133	213	<b>0.27 (import)</b>
<b>Mining, quarrying, and oil and gas extraction</b>	\$43,387.40	- \$52,502.68	6,332	-7,638	-6,076	<b>0.17 (import)</b>
<b>Forestry, fishing, and related activities</b>	\$25,795.77	\$4,769.32	3,070	263	-171	<b>0.10 (import)</b>

Source: BEA tables CAEMP25 and CAIN6. 2010, 2019.

Workforce Development

Overall L.A. County and California have similar labor force participation rates as compared to the U.S. national average. A significant difference can be seen for the age categories 16 to 19 and 20 to 24. As shown in Figure 11, in both cases, at 16 to 19 even more so, L.A. County's participation rate is lower than California's, and California's is lower than the national average.

Figure 11. Labor Force Participation Rate 2019



Source: U.S. Census Bureau ACS 1 Year Estimates, Table S2301. 2019



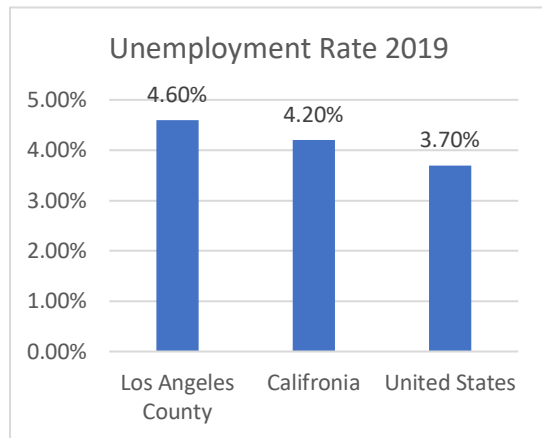
In general, the annual unemployment rate for Los Angeles County (4.6%) is higher than California (4.2%), and both are higher than the U.S. average (3.7%) in 2019, as Bureau of Labor Statistics data shows in Figure 12. The current, as of March 2021, unemployment rate for L.A. County is 10.9%, California is 8.2%, and U.S. is 6.2%. These numbers are elevated as compared to the 2019 annual average because of the SARS-CoV-2 pandemic.

Unemployment rates started to go up slightly in March 2020 and peaked in April 2020. Ever since they have been decreasing, however, L.A. County's unemployment rate of 10.9% is still more than double the 2019 annual average (4.6%). Although it is unclear how long it will take for the market to recover, unemployment numbers as of right now, March 2021, should be viewed as a statistical anomaly due to the pandemic.

This means current numbers are not representative of L.A. County's general market. However, it is interesting to notice that L.A. County's market seems to have more difficulties than the U.S. and California in general to bounce back to before pandemic unemployment rates. This could be due to the fact that cities because of denser population, are more vulnerable to viral transmissions, and therefore, stricter measures had to be taken.

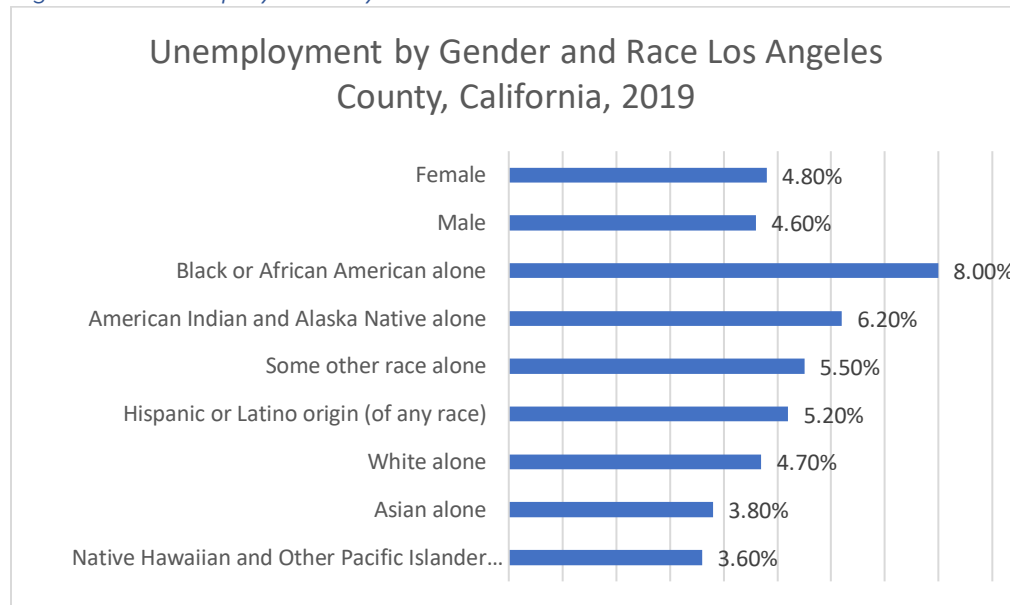
Figure 13 (U.S. Census data) shows, that Black or African Americans have the highest unemployment rate with 8% followed by native Americans and native Alaskans with 6.2% in L.A. County in 2019. Only native Hawaiians (and Other Pacific Islanders) and Asians are below the average unemployment rate of L.A. County (4.6%), with 3.6% and 3.8% respectively. Whites are just above with 4.7% followed by Hispanics or Latinos with 5.2%.

Figure: 12. Unemployment 2019



Source: BLS. Local Area and Current Population Survey. 2019

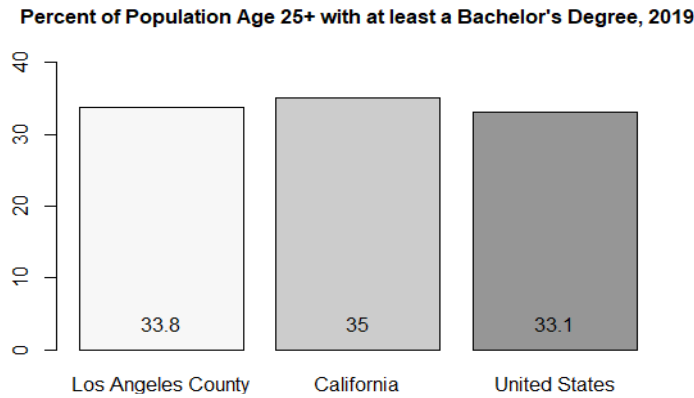
Figure 13. Unemployment by Gender and Race 2019



Source: U.S. Census Bureau ACS 1 Year Estimates, Table S2301. 2019

Figure 14 shows that the educational attainment of a bachelor's degree or more for people over 25, is lower in L.A. County (33.8%) than in California (35%) on average but just above the national average (33.1%).

Figure 14. Educational Attainment L.A. County 2019



Source: U.S. Census Bureau ACS 1 Year Estimates, Table B15002. 2019

Unemployment in L.A. County is not as clearly related to educational attainment as one would hope. For example, Black or African Americans have much higher educational attainments (Figure 15) than Hispanic or Latinos (Figure 16). A report from the "UCLA Labor Center", "Los Angeles Black Worker Center", and "UCLA Institute for Research on Labor Employment", indicated that Black workers face hiring

discrimination because of the sounding of their last name and the perception of employers that immigrants work harder ( *UCLA Labor Center*, n.d.). Furthermore, the report mentions that Blacks and African Americans traditionally worked in the manufacturing or construction industry in L.A. County but also California in general ( *UCLA Labor Center*, n.d.). Since much of the manufacturing in L.A. County closed in recent decades ( *UCLA Labor Center* n.d.) and the local shift share between 2010 and 2019 shows that the trend continues (Table 2), Blacks, African Americans, and Hispanics would have to see an increase in their bachelor's degrees to keep up with Asian (Figure 17) and Whites (Figure 18) on the job market. However, the strong presence of trade schools in L.A. County provides an alternative path for unemployed people who have been without luck finding jobs in the manufacturing and construction industry.

Figure 15.

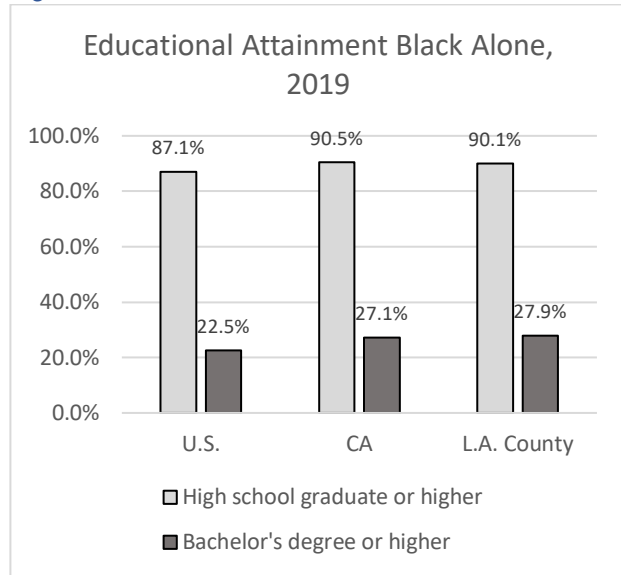


Figure 16.

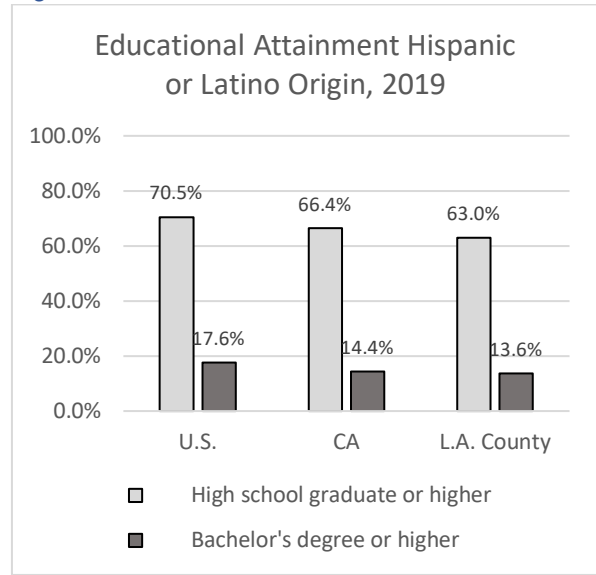


Figure 17.

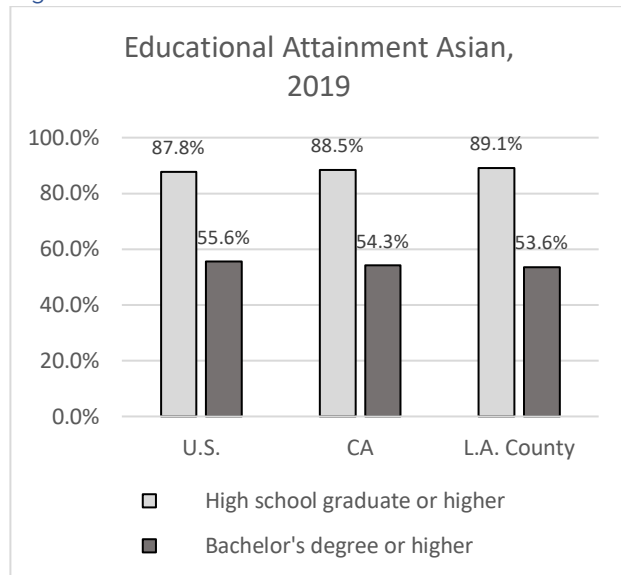
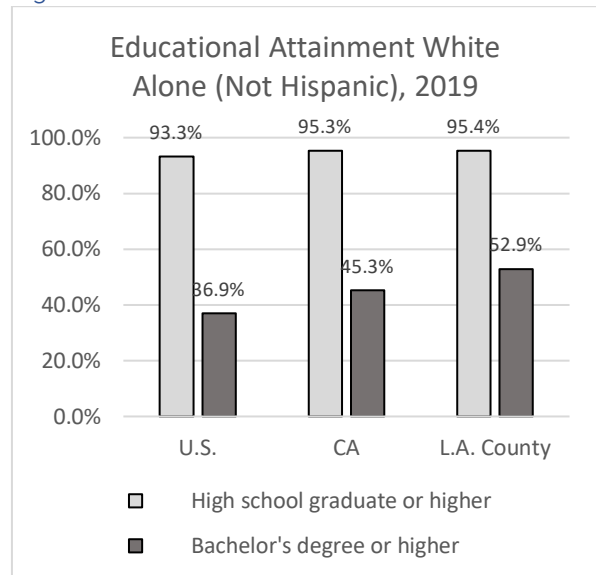


Figure 18.



Source: U.S. Census Bureau ACS 1 Year Estimates, Table S1501. 2019

Most of the trade schools in the L.A. County area provide study opportunities for medical and nursing, cosmetology and barbering, legal and criminal justice, audio-visual technology, and transportation logistics as seen in Appendix Table 4. This very well reflects strong industry sectors such as the medical, information technology, transportation, arts and entertainment, and real estate as shown earlier in Table 2 and Figure 10 or Appendix Table 3.

## Transportation Analysis

The transportation analysis takes several factors into consideration. The commute times, means of transportation, transit organizations, the inflow and outflow of workers, distance to the workplace, and ridership for the L.A. County Metro system. L.A. County is sprawling and with it come longer commute times. Public transportation has decreased which is almost entirely attributable to the decrease in bus ridership. It is speculated that an increase in street traffic causes slower buses and disincentives people to commute by bus which in turn creates more car traffic. L.A. County plans to upgrade their rail infrastructure to hopefully decrease congestion.

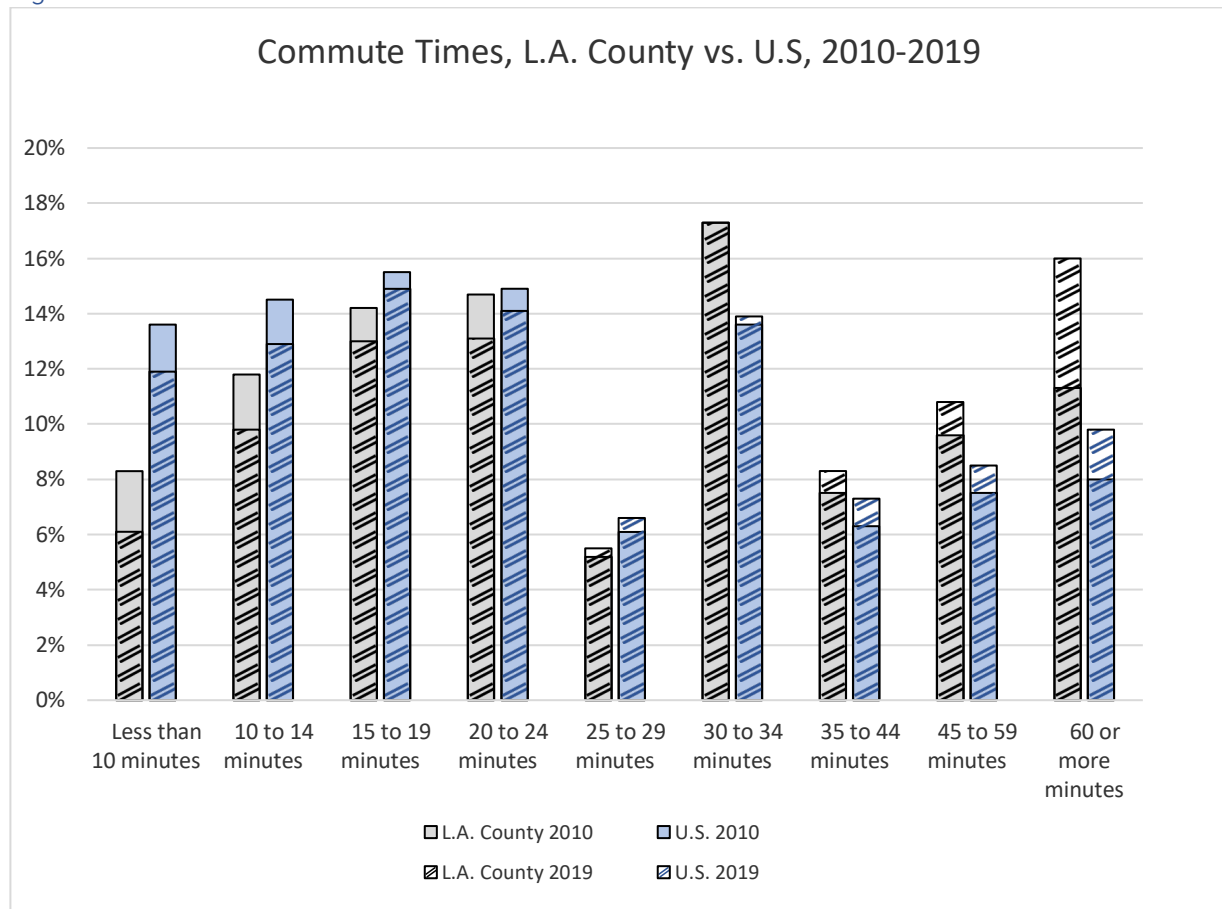
### Overview

The average travel time for Los Angeles County workers increased from 2010 with 28.8 minutes to 32.8 minutes in 2019, which is about 4 minutes higher than the national average. The difference isn't that substantial; however, the relative distribution of travel time gives a clearer picture. As Figure 19 shows, the shift between 2010 and 2019 of commute times shows that it gets less common to commute below 30 minutes and more common to commute above 30 minutes in L.A. County. This would suggest either heavier traffic or people moving to suburban or rural areas to escape higher living cost, as for example the high housing and rental prices indicated in figure 5 and 6.

**A closer look:**

As shown in Figure 19. L.A. County follows the general U.S. national average pattern, but also has some clear distinctions. Only 6% of L.A. County workers have less than 10 minutes to commute to work whereas the U.S. average is at 12%. A 30-to-34-minute commute is most common in Los Angeles County and is higher by about 3% as compared to the U.S. Between 2010 and 2019 commutes to work over 60 minutes significantly increased from 11.3% to 16%. In general, every commute time lower than 30 minutes is more common in the U.S. on average, and every commute time above 30 minutes is more common in L.A. County.

Figure 19. Commute Times 2010-2019

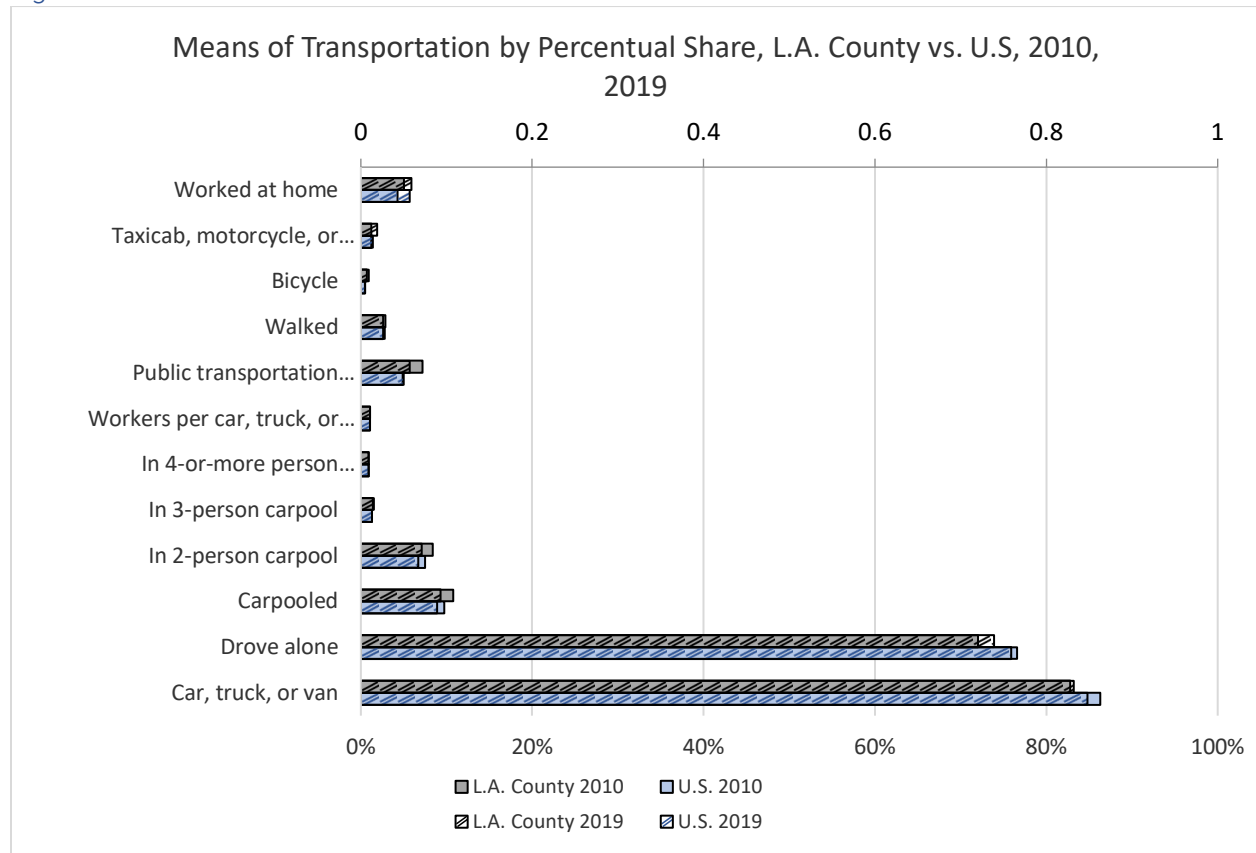


Source: U.S. Census Bureau ACS 1 Year Estimates, Table S0801. 2010, 2019

### Modes of Transportation

Figure 20 shows, there is a general trend to increase working from home, increase driving alone, and decrease carpooling for both Los Angeles County and the U.S. Interestingly L.A. County has seen a decrease of public transport whereas the national average remained the same between 2010 and 2019.

Figure 20.



Source: U.S. Census Bureau ACS 1 Year Estimates, Table S0801. 2010, 2019

Los Angeles County has five primary modes of transportation: bus transit, vanpool, commuter rail, heavy rail, and light rail. Table 3 shows that L.A. county is amongst the largest transit authorities in the U.S. When looking at the ranking in Table 3, the Los Angeles County Metro Transportation Authority (LACMTA) is strong in the areas of bus, vanpool, and light rail transit, but lacking in commuter rail services. Heavy rail transit is mitigated by the Southern California Regional Rail Authority (Metrolink) which is also lacking behind. Bus services in L.A. County rank second and third in the nation, however, commuter and heavy rail rank eighth and ninth nationwide according to APTA Fact Book. This suggests that L.A. County has potential to upgrade their commuter rail and heavy rail service to counter act the longer commute times as seen in Figure 19 and the increase in driving alone as seen in Figure 20.

A recent Los Angeles Times article, however, mentions that the lack of rail infrastructure in L.A. County and California could be soon solved. The Biden administrations plans to create a \$3 trillion infrastructure budget for the U.S. Specifically Metrolink has a \$10 billion, of which \$2 billion are secured, program to enhance 75 rail projects. \$3 to \$4 billion are expected from the Biden administration infrastructure plan (VARTABEDIAN, 2021). This infrastructure improvement would help with the current lack of rail services.

In addition to passenger trips and miles, Table 2 shows a ranking of transportation services in L.A. County but also Los Angeles City. The rank column indicates the nationwide rank for the type of transportation service.

*Table 3: Transit Agencies in Los Angeles County, California 2018.*

<b>Transit Agency</b>	<b>Type</b>	<b>Unlinked Passenger Trips (Thousands)</b>	<b>Passenger Miles (Thousands)</b>	<b>Ridership per Mile of Track</b>	<b>Rank</b>
<b>Los Angeles County Metro. Transp. Auth. (LACMTA)</b>	Light Rail	66,387.20	495,011.70	386,646.50	1
<b>Los Angeles County Metro. Transp. Auth. (LACMTA)</b>	Bus Agency*	273,625.40	1,111,245.20	N/A	2
<b>Los Angeles County Metro. Transp. Auth. (LACMTA)</b>	Transit Vanpool	3,428.20	151,003.90	N/A	2
<b>Los Angeles County Metro. Transp. Auth. (LACMTA)</b>	Bus Rapid Transit	7,168.50	47,544.30	N/A	3
<b>Los Angeles County Metro. Transp. Auth. (LACMTA)</b>	Commuter Rail	14,190.90	438,553.70	30,623.40	8
<b>Southern California Regional Rail Authority (Metrolink)</b>	Heavy Rail	43,752.30	210,105.50	1,375,858.10	9
<b>City of Los Angeles Dept. of Transportation (LADOT)</b>	Commuter Bus Agency	1,355.10	23,707.60	N/A	15
<b>City of Los Angeles Dept. of Transportation (LADOT)</b>	Bus Agency*	16,772.80	28,046.80	N/A	43

\* Excludes Bus Rapid Transit and Commuter Bus Service Reported Separately

Source: APTA Fact Book. 2020

Figure 21 shows, the in and out flow of workers for L.A. County for L.A. County, 2010 and 2018. As population increased people living outside and working inside of L.A. County increased. The same is true for people who live inside L.A. County and work outside. Interesting to notice, however, is that people who live and are employed in L.A. County increased more than commuters. This is perhaps a normal phenomenon since most of the workers live inside of L.A. County.

Figure 21

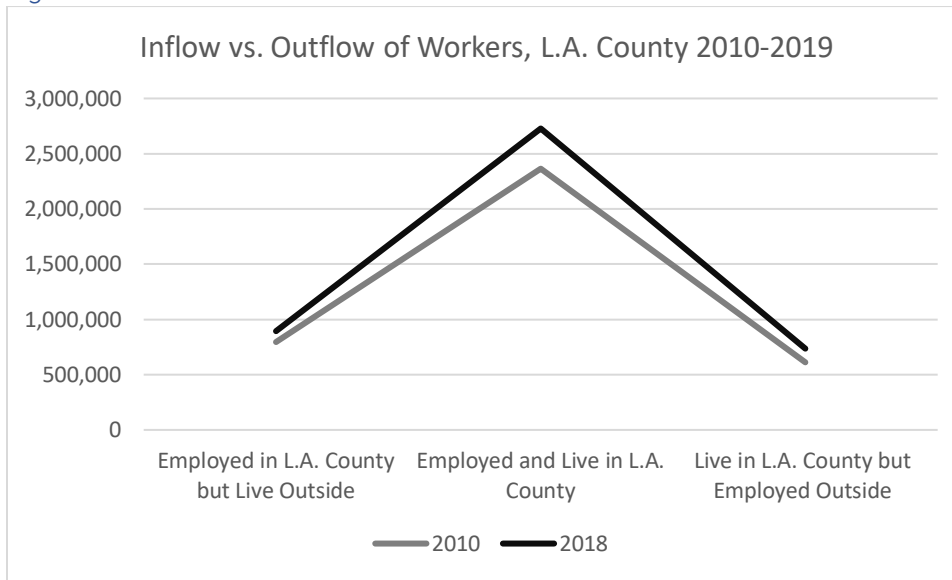
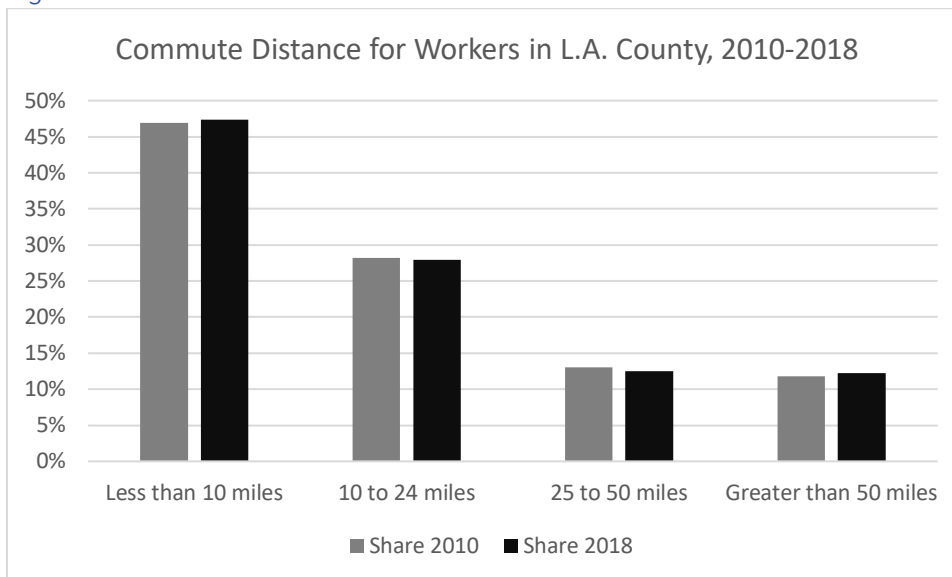


Figure 22 shows the percentage of workers who work inside of L.A. County and have to commute a certain number of miles to work from home. This also includes people living outside of L.A. County but working in L.A. County. Again, we can observe a similar trend to figure 21 that there has not been much of a change between 2010 and 2018 for workers regarding their commute distance. There hasn't been a big increase in people living outside L.A. County and working in L.A. and neither was there a big increase of miles driven to work. Therefore, the higher commute times in figure 19, which could lead to the obvious suggestion that people are leaving L.A. County for cheaper housing, but still work in L.A. County isn't true. Also, the idea that people are migrating within L.A. County increasing distance to their job isn't true, as well.

Figure 22.



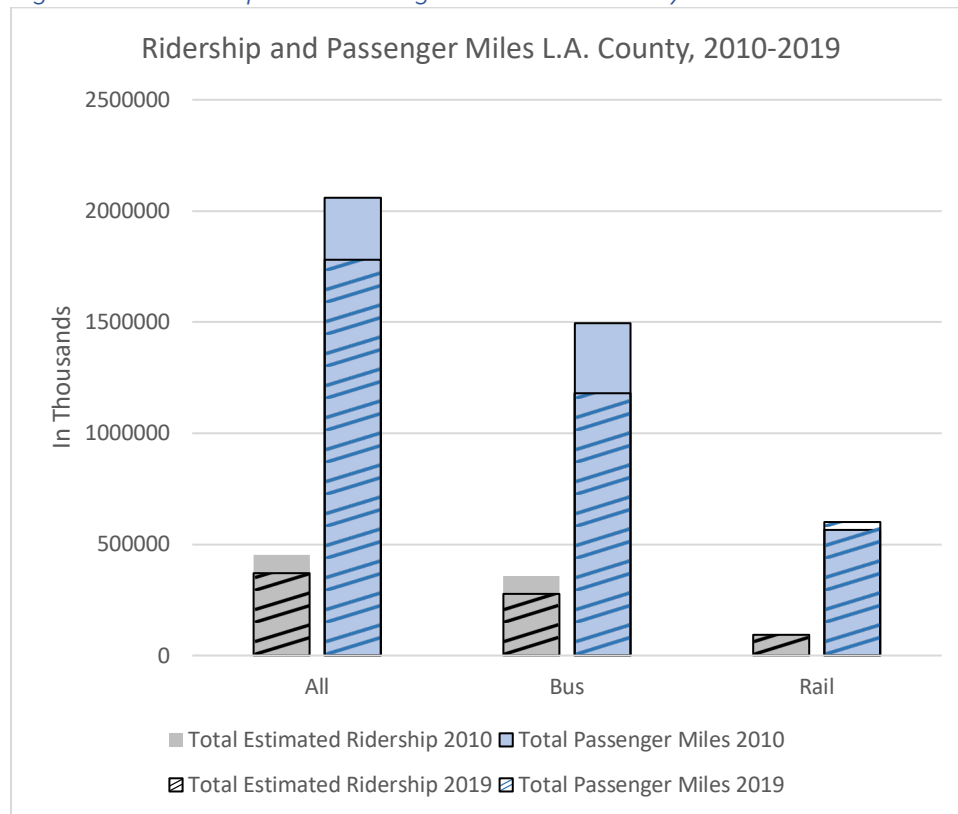


Digging Deeper

Between 2009 and 2017 the number of so called "super-commuters" – commute times longer than 90 minutes – has increased by 22% (Chiland, 2019). Longer commute times doesn't have to mean exclusively that people travel from farther away, it could be multiple transit transfers and increased traffic from urban sprawl (Chiland, 2019). Figures 21 and 22 confirm the idea that distance hasn't increased substantially, and that urban sprawl is likely the reason for longer commute times. In 2014 transit prices for bus and train increased, gas prices decreased, and bus ridership decreased as well (Chiland, 2017). In 2016 bus ridership kept still dropping; 6% from 2015 to 2016 (Hymon, 2017). Officials mention that bus rider number could be declining for various reasons (Hymon, 2017). Amongst others are concerns of safety, slower buses, over 24 major job locations, and increased usage of Uber and Lyft (Hymon, 2017).

Figure 23 shows a drop in passenger miles and ridership for buses. It also shows a drop for the general Metro system in L.A. County, even though, rail commuters increased. Figure 23 also reveals that L.A. County strongly depends on buses for public transportation. As shown in Table 3, L.A. County ranks at top nationally for bus transportation but only 8<sup>th</sup> and 9<sup>th</sup> for rail transportation. Ridership and passenger miles for rail services are much less than for buses. This suggests that for L.A. County, with a strong urban core, it is time to invest more into rail infrastructure which is planned (VARTABEDIAN, 2021).

Figure 23. Ridership and Passenger Miles L.A. County



Source: Los Angeles County Metropolitan Transportation Authority. Interactive Estimated Ridership Stats. 2010, 2019

It is suggested that Los Angeles County has seen growth over the past decade but has not kept up with infrastructure improvements to accommodate the increase (Chiland, 2019). L.A. County probably must rethink qualitatively rather than increase infrastructure quantitatively. Buses are sharing lanes with cars (Chiland, 2019) and Uber and Lyft are getting more popular (Hymon, 2017). This in combination with more cars driving alone (Figure 20.) indicates that the street system is not sufficient to satisfy L.A. County's travel needs. Most likely there are two major future interventions that can positively impact L.A. County's transportation systems and infrastructure. Denser and cheaper housing closer to major job locations (Chiland, 2019) and better rail infrastructure (Figure 23).

### Housing Conditions & Trends

The housing analysis focuses on the distribution of owner- and renter-occupied housing, the kind of housing stock that is available, housing values, and affordability concerns. Also, vacancy and segregation are important factors to look at when conducting a housing analysis. Overall, there is an affordable housing crisis for renters as well as for owners, which is most likely due to the speculative real estate market and the construction luxury units for higher development profits. The housing stock is also aging which suggests that there will be reconstruction opportunities in the future. About 220,000 new households are expect by 2040.

#### Overview

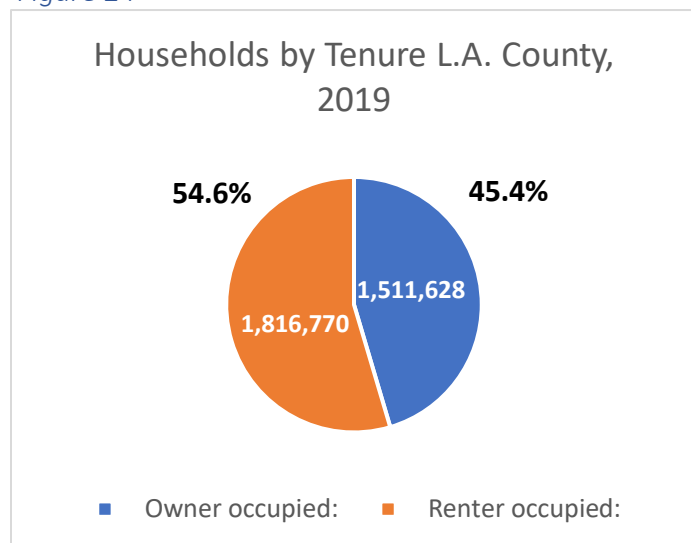
Table 4 shows, that the median household income for all households (renter and owner occupied included) is \$72,797. Owner-Occupied median household income is \$103,538 and renter-occupied median household income is \$52,932. Figure 24 shows 54.6% renter occupied and 45.4% owner occupied housing in L.A. County, California in 2019.

Table 4

Median household income	Estimate
Total:	\$72,797
Owner occupied (dollars)	\$103,538
Renter occupied (dollars)	\$52,932

Source: U.S. Census Bureau, American Community Survey 1-year Estimates, 2019. Table B25119.

Figure 24



Source: U.S. Census Bureau, American Community Survey 1-year Estimates, 2019. Table B25118.

### Renter-Occupied Housing Affordability

A renter gap analysis looks at the number of households for income ranges established based on the renter occupied median household income (\$52,932, L.A. County). It establishes the maximum rent affordable for each income range ((yearly household income/12) \*0.3) which is based on 30% of the household income. Then the number of households in each income category is compared to the available housing at the maximum affordable rent. This results in either a surplus or deficit of rental units.

In 2019, affordability issues have been observed for income categories below 50% of the median household income. As table 5 shows, 274,431 rental units were missing for the two lowest income ranges. This means that households having a yearly income below half ( $\$52,932/2 = \$26,466$ ) of the median renter occupied income, have to pay rent over 30% of their monthly income. 30% is consider the maximum affordable income cut off for housing costs since households have to pay other bills, food, transportation, etc., as well.

Table 5

**Los Angeles County Rental Affordability Gap Analysis, 2019**

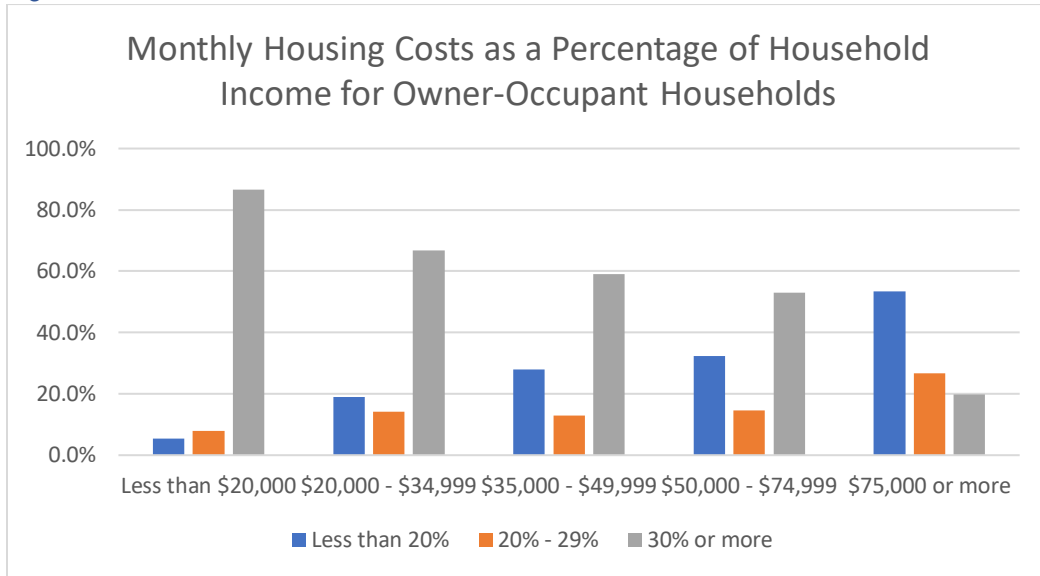
Income Range	Maximum Affordable Monthly Rent	# Households	# Rental Units Available at that Price	Surplus/Deficit of Units Available
Less than 30% AMHI (\$15,880)	\$397	268,834	123,752	(145,082)
30%-50% AMHI (\$15,880-\$26,466)	\$662	194,128	64,779	(129,349)
50%-80% AMHI (\$26,466-\$42,346)	\$1,059	265,038	285,995	20,957
80%-100% AMHI (\$42,346-\$52,932)	\$1,323	159,672	301,827	142,155
100%-125% AMHI (\$52,932-\$66,165)	\$1,654	174,172	324,141	149,969
> 125% AMHI (> \$66,165)	>\$1,654	754,926	716,276	(38,650)

Data source: US Census Bureau, ACS 2019 1-year data. Table B25118, B25119, B25056

### Owner-Occupied Housing Affordability

The owner-occupied housing analysis looks at fixed income ranges and establishes how many households have monthly housing costs above 30%, below 20%, or in between 20 and 29%. The median owner-occupied household income is \$103,538. Figure 25 shows that most of the households below \$75,000 household income have non-affordable housing. That means the majority below \$75,000, has to pay 30% or more of their income on monthly housing costs. Only households making more than \$75,000 see improvement to this affordable housing crisis.

Figure 25



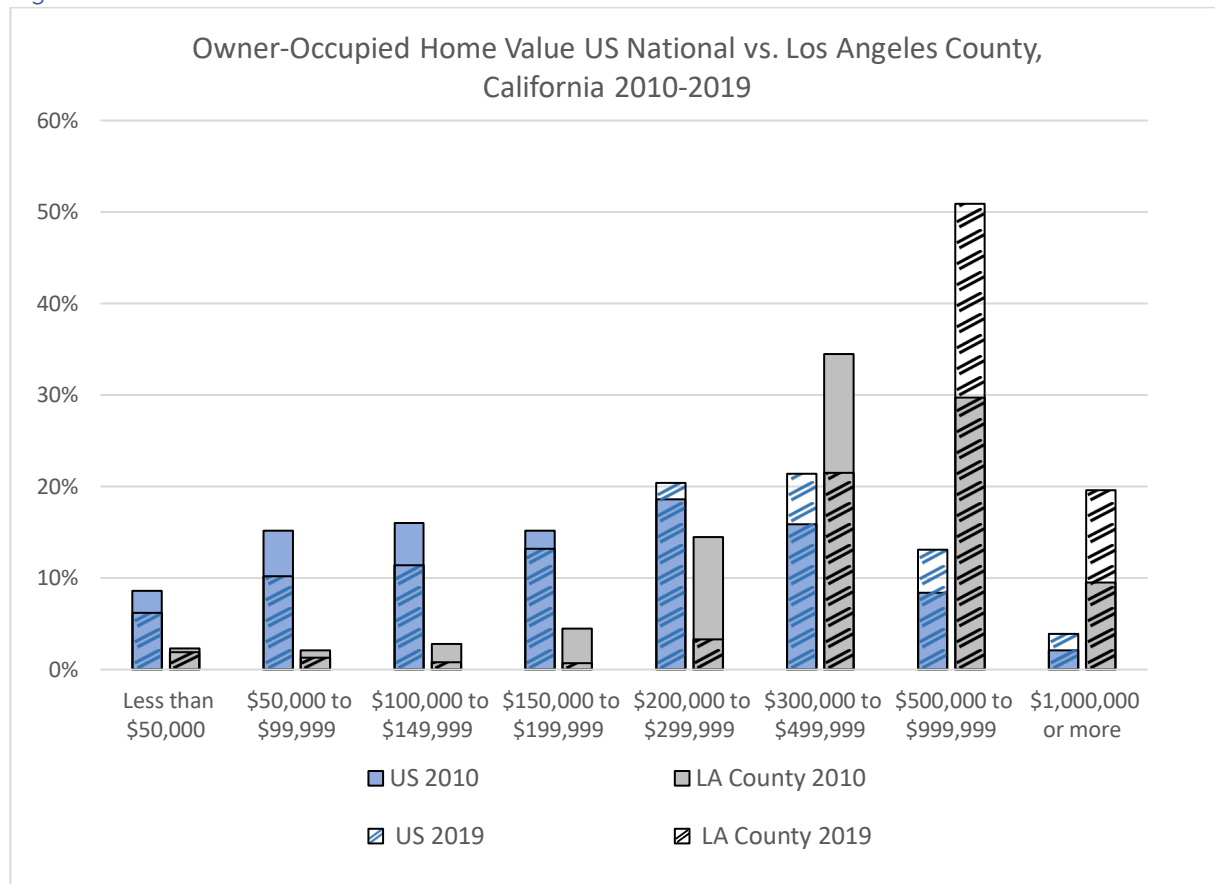
Source: U.S. Census Bureau, American Community Survey 1-year Estimates, 2019. Table S2503.

This affordability crisis at low-income ranges for renter- and owner-occupied housing invites for government intervention. Usually, developers shy away from building affordable housing because it is difficult to hit a return of investment (ROI) at about 12% which is a standard in the real estate industry. Governments can create incentives through community benefits agreements (CBAs), policy tools, and restrictive zoning and the granting of variances as long as it is rationally related to the interest of health, safety and welfare of the people.

#### Housing and Rental Value

Figure 26 illustrates also fast-growing housing prices in L.A. County vs. U.S. national average prices for 2010 and 2019. L.A. County has seen a substantial decrease in housing stock which is valued below \$500,000 and has nearly doubled housing stock valued over \$500,000 in only 9 years. This clearly illustrates the issue of affordable housing as mentioned before (figures xx). Census data shows no reliability issues.

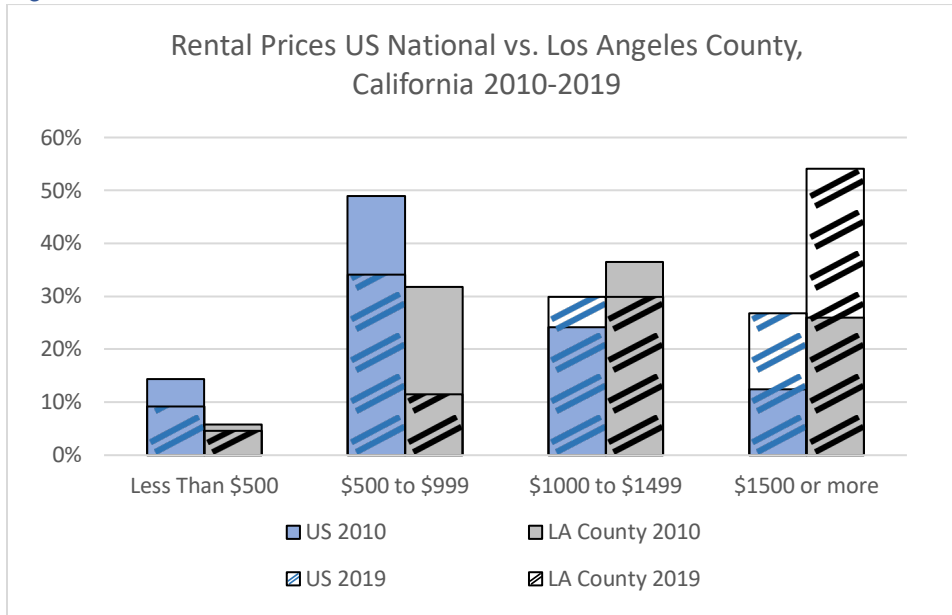
Figure 26



Source: U.S. Census Bureau, American Community Survey 1-year Estimates, 2010-2019. Table DP04.

Rent prices have been similarly affected as shown in Figure 27. Available rental units between \$500 and \$1499 have decreased and rental units above \$1500 have doubled in numbers. Census data shows no reliability issues.

Figure 27



Source: U.S. Census Bureau, American Community Survey 1-year Estimates, 2010-2019. Table DP04.

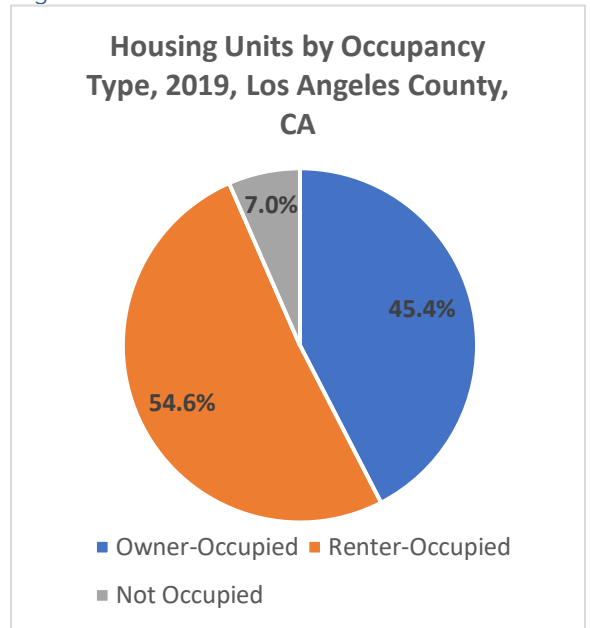
### Vacancy

L.A. County has a 7% vacancy rate for housing structures, shows Table 6 and Figure 28. 4% is considered healthy to allow for people to move out and others in again. The highest vacancy comes from other reasons according to census data. The second highest reason for vacancy with 30.1% is that a unit is for rent but has no renter at the moment. A recent report on vacancy in Los Angeles, is likely it explains why other vacancies and for rent vacancies make up about 70% of the 7% housing vacancy. There is a big issue with speculative unit and land vacancy (*The Vacancy Report*, n.d.). This means that real estate is being held off the market or priced at high rates until more profit can be made. The same is true for vacant land. Furthermore, the report mentions the already discussed affordable housing crisis and a tendency of developers to build expensive units for higher profits even though they are not needed and most likely will stay partially vacant. A vacancy tax as penalty, lifting limitations on transforming apartment units from rent to owner, and lifting limitations on demolition are proposed as potential solutions (*The Vacancy Report*, n.d.). Census data shows no reliability issues.

Table 6

	Number	Percent
<b>Total Housing Units</b>	<b>3,579,423</b>	
<i>Owner-Occupied</i>	1,511,628	45.4%
<i>Renter-Occupied</i>	1,816,770	54.6%
<i>Not Occupied</i>	251,025	7.0%
<b>Vacancy by Reason</b>		
		<b>Percent of Vacant Units</b>
<b>Other vacant</b>	101,754	40.5%
<b>For rent</b>	75,624	30.1%
<b>For seasonal, recreational, or occasional use</b>	31,712	12.6%
<b>For sale only</b>	17,352	6.9%
<b>Rented, not occupied</b>	15,297	6.1%
<b>Sold, not occupied</b>	9,286	3.7%
<b>For migrant workers</b>	0	0%
<b>Total</b>	251,025	100%

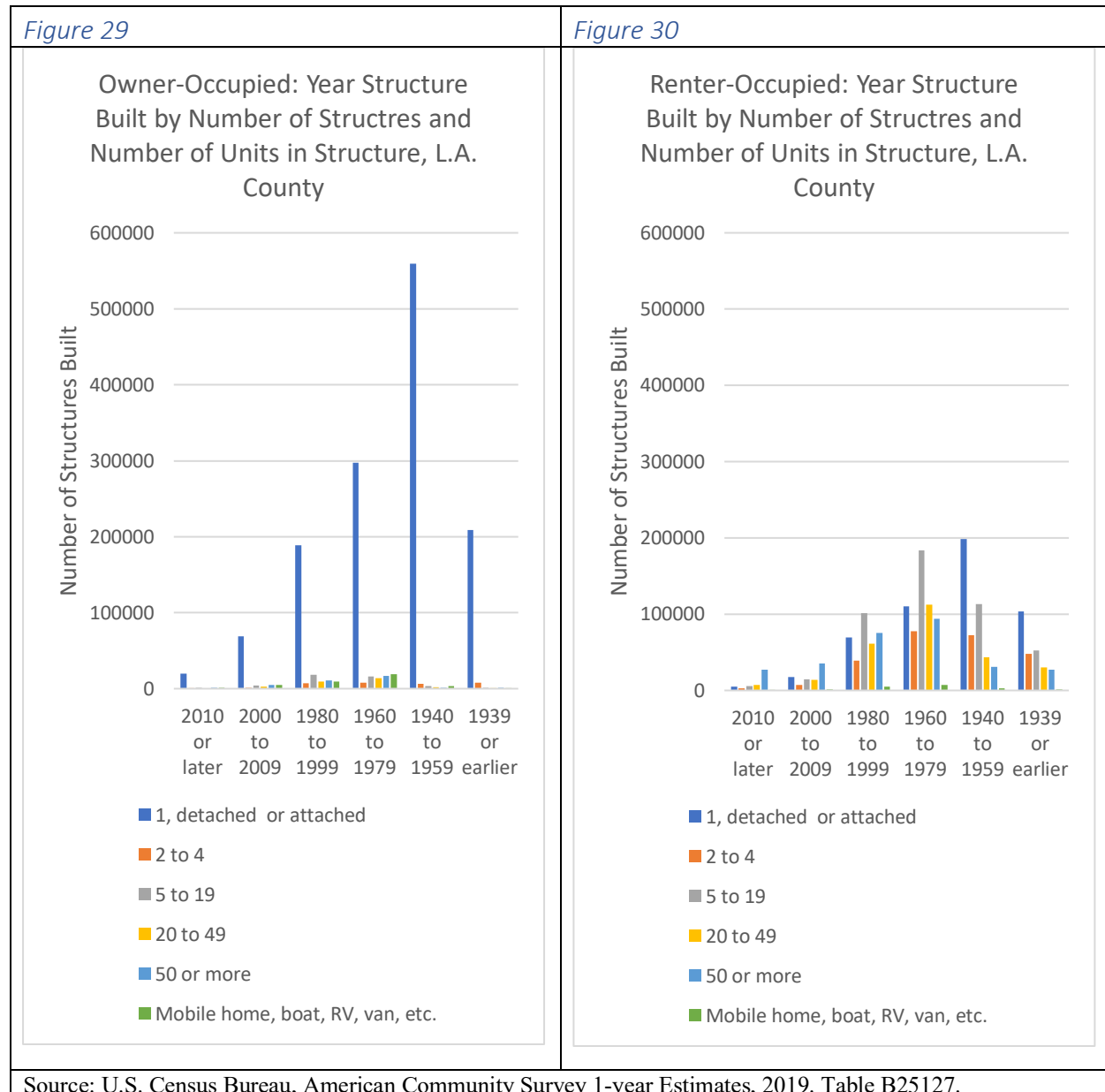
Figure 28.



Source: U.S. Census Bureau, American Community Survey 1-year Estimates, 2019. Table B25004.

Historic Housing Stock

The L.A. County housing stock is aging. Most of the houses and apartment buildings were built between 1940 and 1959. Figures 29 and 30 also visualize that until now the demand for new units has steadily declined. This means as housing stock gets older and has to be replaced, there will be opportunities to build more affordable housing. Census data shows reliability issues for multi-unit housing structures.

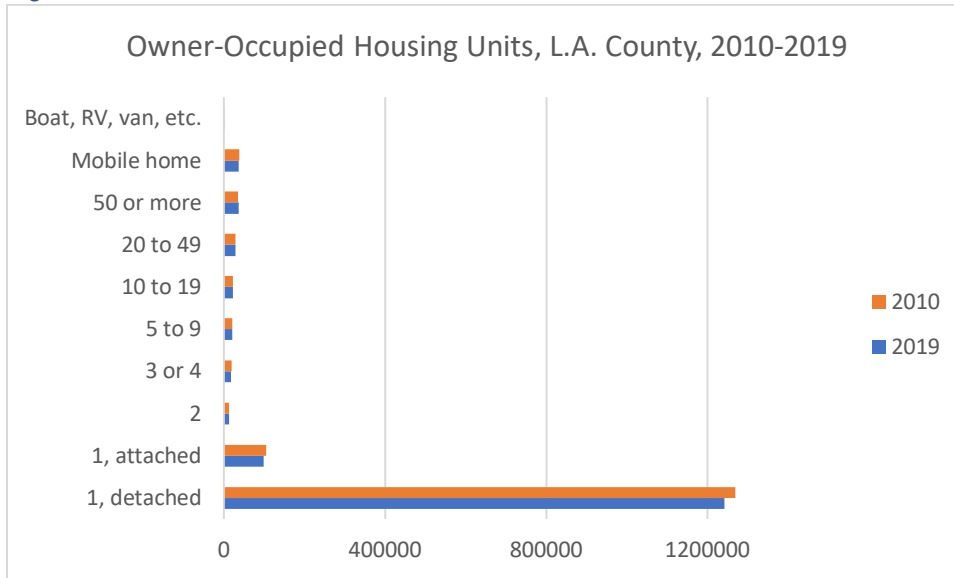




Current Housing Stock

Figure 31 shows the owner-occupied stock for 2010 and 2019. Owner occupied housing is strongly dominated by traditional single-family houses. It seems that building apartment blocks with multiple units would take care of a huge chunk of non-affordable housing (Figure 25) since most non-rental units are single family houses, which are likely much more expensive than apartment units. Also lifting limitations on condominiums would help make owner-occupied housing more affordable (*The Vacancy Report*, n.d.)

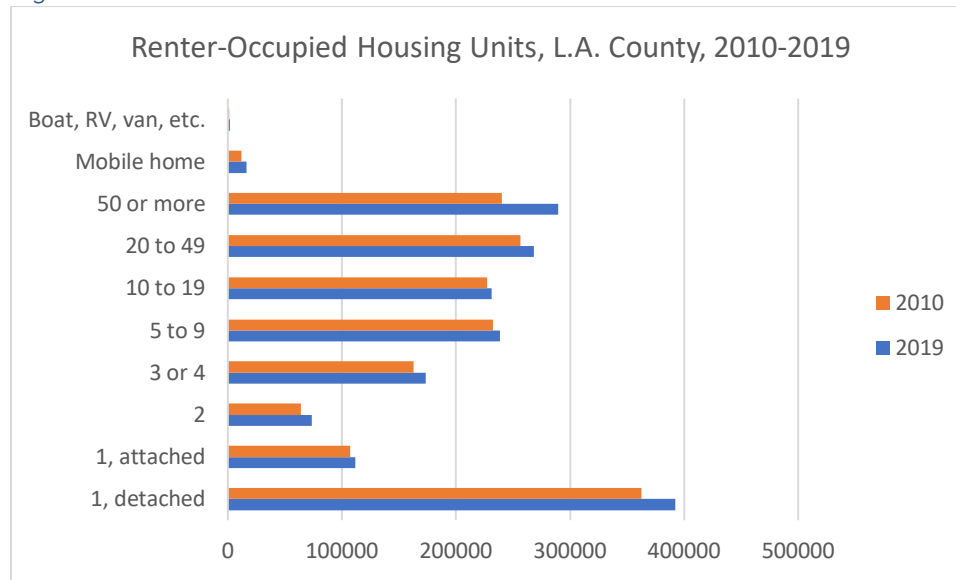
Figure 31



Source: U.S. Census Bureau, American Community Survey 5-year Estimates, 2010-2019. Table B25032.

The renter-occupied affordable housing issue is most likely harder to solve than the owner-occupied housing problem. The renter-occupied units are also dominated by single family houses but are closely followed by multifamily units with 50 or more units per building (Figure 32). Even though there was a gain between 2010 and 2019 in units for buildings with 50 or more units, the rental gap analysis (Table 5) shows a strong deficit for affordable housing. Government policy to bargain with the developers to have more affordable units seems to prospective path into the future (*The Vacancy Report*, n.d.)

Figure 32



Source: U.S. Census Bureau, American Community Survey 5-year Estimates, 2010-2019. Table B25032.

### Housing Future Direction

There is an opportunity to counter act this extreme non affordable housing trend by building or allocating affordable rent and owner-occupied housing in the future. The approximate number of new households will be 221,069 and the average household size will drop from 2.96 to 2.94. If L.A. County were to build or arrange to build these new households as an affordable option, it would help decrease the affordable housing crisis. More affordable housing most likely means denser housing and buildings with multiple units. To make sure units will be affordable government could step in and ask for affordable housing in turn for building permits through policy tools such as community benefits agreements. Furthermore, government must step in to combat the speculative real estate market that withholds units by increasing prices or taking them off the market until prices are higher (*The Vacancy Report*, n.d.). Vacancy tax penalties, allowing more condominium ownership, and more lenient demolition policies (*The Vacancy Report*, n.d.) in combination with more multi-unit development under CBAs to ensure affordable housing, should be done to improve the quality of life of people in L.A. County.

#### **A closer look:**

In 2019 the population was about 10,039,107 with an average household size of 2.96 people. This equals to about 3,391,591 households. The projected population growth for 2040 is about 10,613,614 with an average household size of 2.94 which equals to about 3,612,660 households. This makes 221,069 new households in 2040.

## Diversity

The index of dissimilarity measures how much two groups are equally distributed in multiple subareas to understand how well integrated or how segregated two groups are over a larger area. In this analysis the Hispanic and not Hispanic population numbers, for each census tract have been taken. For each census tract it was measured how equally Hispanic and not Hispanics are represented. After aggregating the results for all census tracts in L.A. County, the index of dissimilarity for 2010 was 0.518 and the index of dissimilarity for 2019 was 0.505. An index closer to 1 means more equal distribution of the two groups (Hispanic and not Hispanic) in all the sub areas(L.A. County census tracts) and vice versa an index closer to 0 means less equal distribution and therefore more segregation. As observed in the index numbers for 2010 and 2019, there is a very slight tendency towards segregating Hispanics from not Hispanics. However, the census tract data has a to low reliability to detect a significant difference for the numbers which are as close as 0.518 and 0.505. That means we cannot draw any conclusions from this analysis.

Index of Dissimilarity 2010: 0.518045 .

Index of Dissimilarity 2019: 0.505048

Source: U.S. Census Bureau, American Community Survey 5-year Estimates, 2010. Tables DP05.

The Entropy Index of Diversity measures how uniformly multiple groups are represented. For this analysis, the number of Whites, Blacks or African Americans, American Indians and Alaska Natives, Asians, Native Hawaiians and other Pacific Islanders, some other race, and two or more races have been taken for L.A. County in 2010 and 2019. The Entropy Index of Diversity in 2010 was 0.696 and in 2019 was 0.684. This shows a similar as observed for Hispanics and not Hispanics that here diversity slightly decreased. Important to note is that this analysis did not take sub areas (census tracts) but is only based on the county level of numbers. This analysis has reliable numbers and the difference between 0.696 and 0.684 is statistically significant. That means we can draw conclusions from this analysis.

Entropy Index of Diversity 2010:  $H = 1.354135$ ;  $H^* = 0.695888$

Source: U.S. Census Bureau, Decennial Census. 2010. Table P3.

Entropy Index of Diversity 2019:  $H = 1.331901$ ;  $H^* = 0.684462$

Source: U.S. Census Bureau, American Community Survey 1-year Estimates, 2019. Tables B01001(A-G)

## Conclusion

Young L.A. residents are leaving due to high housing prices. Increased street traffic happens because of urban sprawl and therefore, bus ridership dropped. An upgrade of the rail system is much needed to satisfy the high commute demand of L.A. County. Denser more affordable housing at major job sites could be the answer to decrease commute times as well as the affordable housing crisis. Government has to step in and stop the speculative real estate market which keeps units at a high price or off the market until prices increase again. Unemployment of minorities can be solved by promoting trade school instead of traditional manufacturing and construction jobs.

Future research has to be conducted on where rail infrastructure makes the most sense. Where the major job centers are to build affordable housing. Which policy fits best L.A. County best to combat the speculative real estate market, which requires better data collection as well.

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## Appendix

Calculation of Population Projection 2040:

Base Year: 2000 = 9519315 people

Launch Year: 2019 = 10039107 people

Base Period: 19

Horizon Period: 21

$$PE = \text{Launch year} + (\text{horizon period}/\text{base period}) * (\text{launch year} - \text{base year} = 10039107 + (21/19) * (10039107 - 9519315) = 10,613,614$$

Calculation of Average Household Size Projection 2040:

Base Year: 2000 = 2.98 people

Launch Year: 2019 = 2.96 people

Base Period: 19

Horizon Period: 21

$$PE = \text{Launch year} + (\text{horizon period}/\text{base period}) * (\text{launch year} - \text{base year} = 2.96 + (21/19) * (2.96 - 2.98) = 2.94$$

Average Year Over Change Formula:

$$\frac{\sum \frac{\text{Final Year} - \text{Initial Year}}{\text{Initial Year}}}{\text{Number of Years}}$$

Average Annual Rate of Change Formula:

$$\frac{\text{Final Year}}{\text{Initial Year}}^{\frac{1}{\text{Number of Years}}} - 1$$

Date	Total Population L.A. County	AYOC	Hispanic or Latino L.A. County	AYOC
2000	9,519,315			
2001	9,626,034	1.12%		
2002	9,705,913	0.83%		
2003	9,767,145	0.63%		
2004	9,793,263	0.27%		
2005	9,786,373	- 0.07%		
2006	9,737,955	- 0.49%		
2007	9,700,359	- 0.39%		
2008	9,735,147	0.36%		
2009	9,787,400	0.54%		
2010	9,818,605	0.32%	4,704,043	
2011	9,876,482	0.59%	4,760,974	1.21%
2012	9,935,375	0.60%	4,802,133	0.86%
2013	9,992,484	0.57%	4,834,936	0.68%

<b>2014</b>	10,040,072	0.48%	4,897,745	1.30%
<b>2015</b>	10,085,416	0.45%	4,926,661	0.59%
<b>2016</b>	10,105,708	0.20%	4,918,830	- 0.16%
<b>2017</b>	10,103,711	- 0.02%	4,939,605	0.42%
<b>2018</b>	10,073,906	- 0.29%	4,915,287	- 0.49%
<b>2019</b>	10,039,107	- 0.35%	4,881,970	- 0.68%

Source: Source: U.S. Census Bureau, Population Division: Table 1. Intercensal Estimates of the Resident Population for Counties of California: April 1, 2000 to July 1, 2010 (CO-EST00INT-01-06)  
 Annual Estimates of the Resident Population for Counties in California: April 1, 2010 to July 1, 2019 (CO-EST2019-ANNRES-06)  
 US Census Bureau, ACS 1-Year Estimate, 2010-2019. Table B010011.

Table 3: Local Shift Share and Location Quotient 2019

Industry	Local Shift Share	Location Quotient			
		Lagging	Emerging	Vulnerable	Stars
<b>Manufacturing</b>	-79,913.19463	0.828846			
<b>Administrative and support and waste management and remediation services</b>	-8,205.993864			1.016257	
<b>Mining, quarrying, and oil and gas extraction</b>	-6,075.869976	0.171259			
<b>Wholesale trade</b>	-5,750.53289			1.233384	
<b>Retail trade</b>	-4,245.763215	0.836874			
<b>Professional, scientific, and technical services</b>	-3,497.381358			1.125387	
<b>Management of companies and enterprises</b>	-3,075.844828	0.848022			
<b>Finance and insurance</b>	-2,473.482849	0.84912			
<b>Federal civilian</b>	-1,868.473476	0.508321			
<b>Forestry, fishing, and related activities</b>	-170.6953308	0.095099			
<b>Military</b>	213.18		0.269815		
<b>Utilities</b>	534.8519409		0.671518		
<b>Educational services</b>	2,205.010547				

<b>Local government</b>	2,592.190788		0.971622	
<b>Real estate and rental and leasing</b>	8,513.034976			1.212364
<b>Information</b>	8,852.221064			2.27972
<b>Construction</b>	11,313.04068		0.654839	
<b>Arts, entertainment, and recreation</b>	15,059.49472			1.689636
<b>State government</b>	17,814.06763		0.554659	
<b>State and local</b>	20,459.70819		0.857764	
<b>Government and government enterprises</b>	23,337.04669		0.770838	
<b>Other services (except government and government enterprises)</b>	29,405.5101			1.204727
<b>Accommodation and food services</b>	48,793.26662		0.98698	
<b>Transportation and warehousing</b>	71,986.77494			1.295565
<b>Health care and social assistance</b>	206,100.5051			1.120524

Source: BEA table CAEMP25. 2010, 2019.

Local Shift Share Calculation:  $\text{Employment 2010} * ((\text{Sector Employment L.A. County 2019} / \text{Sector Employment L.A. County 2010}) - (\text{Sector Employment U.S. 2019} / \text{Sector Employment U.S. 2010}))$

Location Quotient Calculation:  $(\text{Sector Employment L.A. County 2019} / \text{Total Employment L.A. County 2019}) / (\text{Sector Employment U.S. 2019} / \text{Total Employment U.S. 2019})$

Table 4: Trade Schools in L.A. County Area

<b>School Name</b>	<b>Dominant Program</b>
<b>Borner's Barber College</b>	Barbering/Barber
<b>Associated Technical College – Los Angeles</b>	Cardiovascular Technology
<b>Gnomon School of Visual Effects</b>	Computer Graphics
<b>Westwood College – Los Angeles</b>	Corrections and Criminal Justice
<b>Aveda Institute – Los Angeles</b>	Cosmetology/Cosmetologist
<b>International College of Beauty Arts &amp; Sciences</b>	Cosmetology/Cosmetologist
<b>Marinello School of Beauty – Wilshire Blvd.</b>	Cosmetology/Cosmetologist
<b>Marinello School of Beauty – Bell</b>	Cosmetology/Cosmetologist
<b>Marinello School of Beauty – East L.A.</b>	Cosmetology/Cosmetologist
<b>Palace Beauty College</b>	Cosmetology/Cosmetologist



<b>United Education Institute – Huntington Park Campus</b>	Dental Assisting/Assistant
<b>West Coast Ultrasound Institute</b>	Diagnostic Medical Sonography/Sonographer and Ultrasound Technician
<b>Diversified Vocational College</b>	English Language and Literature/Letters
<b>Fashion Institute of Design &amp; Merchandising – Los Angeles</b>	Fashion Merchandising
<b>Academy of Couture Art</b>	Fashion/Apparel Design
<b>Coast Career Institute</b>	Homeland Security, Law Enforcement, Firefighting and Related Protective Services
<b>Abraham Lincoln University</b>	Law
<b>Angeles College</b>	Licensed Practical/Vocational Nurse Training
<b>Career Development Institute</b>	Licensed Practical/Vocational Nurse Training
<b>Central Nursing College</b>	Licensed Practical/Vocational Nurse Training
<b>Marian Health Careers Center – L.A. Campus</b>	Licensed Practical/Vocational Nurse Training
<b>Preferred College of Nursing – Los Angeles</b>	Licensed Practical/Vocational Nurse Training
<b>Elegance International</b>	Make-Up Artist/Specialist
<b>Joe Blasco Makeup Artist Training Center</b>	Make-Up Artist/Specialist
<b>Career College Consultants</b>	Medical Insurance Coding Specialist/Coder
<b>A-Technical College</b>	Medical Office Assistant/Specialist
<b>Everest College – West Los Angeles</b>	Medical/Clinical Assistant
<b>Bryan College</b>	Physical Fitness Technician
<b>American Career College – Los Angeles</b>	Practical Nursing, Vocational Nursing and Nursing Assistants
<b>Los Angeles Film School</b>	Recording Arts Technology/Technician
<b>SAE Institute of Technology – Los Angeles</b>	Recording Arts Technology/Technician
<b>West Coast University – Los Angeles</b>	Registered Nurse – RN
<b>ICDC College</b>	Substance Abuse/Addiction Counseling
<b>Fremont College</b>	Therapeutic Recreation/Recreational Therapy

Source: FindMyTradeSchool. Accessed April 6<sup>th</sup> 2021.