The Nexus Between Housing and Transportation in the Inland Empire
June 2024

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Table of Contents

1. Introduction

Over the past 30 years, Southern California's Inland Empire (IE), encompassing Riverside and San Bernardino Counties, has experienced rapid growth and economic change. As of December 2023, the region's population reached approximately 4.7 million residents, making it the thirteenth most populous metropolitan area in the United States and the third largest in California (U.S. Census Bureau, 2024). The region has tripled in population and positioned itself as one of the nation's fastest-growing areas. This growth is supported by strategic logistical advantages and extensive transportation networks, making the IE a critical hub for economic activity in the state.

A couple of the defining features of the region are its location, approximately 60 miles from the Los Angeles and Long Beach ports, and the relatively lower land and housing costs compared to the coastal areas. These factors have driven economic growth in the logistics industry and residential housing for individuals who work in the neighboring counties. This has led to high levels of truck and commuting traffic and rising housing prices, creating difficulties in balancing growth with a good quality of life for the region.

Another defining feature of the region is the higher education rates. The percentage of residents with a bachelor's degree is around 20%. This rate is lower than the state average of approximately 32% (Growing Inland Achievement, 2020). As CSUSB and UCR, the two regional public universities work to increase this percentage, this study also looks at the perspectives of these university graduates on the quality of life in the region.

This study integrates secondary data from various government sources and primary data collected through a questionnaire of students at the two major public universities in the region. This approach aims to provide an understanding of how housing affordability and transportation efficiency impact Inland Empire residents, particularly emerging professionals or students at California State University, San Bernardino (CSUSB), and the University of California, Riverside (UCR). The goal of this study is to offer insights to inform regional policies and initiatives.

The report begins with an overview of the methodology used to conduct this study. It then provides a short overview of the literature on the housing and transportation balance. This is followed by a review of the data for the communities compared to the survey data collected to provide the reader with an understanding of the region. The final bit of data analyzed is the

quality of life perceptions of the students surveyed. From this analyses, we provide a discussion section and recommendations.

2. Methodology

The Research Challenge Team employed a mixed-methods approach, integrating both secondary and primary data to evaluate the effects of housing affordability and transportation efficiency in the Inland Empire. Data analysis was conducted using a variety of software tools, including ArcGIS for visualizing data through maps and charts, as well as dashboards for consolidating key insights. Additional analysis methods, such as indices, regression analysis, and Excel-based tools, were used to explore regional demographics, housing costs, and transportation patterns. This comprehensive approach provided a detailed understanding of socioeconomic disparities, with a particular focus on underserved communities, to promote equitable and informed decision-making.

Research objectives:

- Secondary Data: Integrate existing data to understand the broader socioeconomic and infrastructural challenges within the Inland Empire.
- Primary Data: Analyze the effects of housing affordability and transportation accessibility on student life and retention in the Inland Empire.

Research statement:

The nexus between housing and transportation in the Inland Empire is a complex interplay of spatial, economic, and socio-demographic elements. The Inland Empire has attracted many looking to live the "American Dream" of owning a home but this has created a trade-off with transportation challenges/costs and environmental impacts.

Research goal:

The research goal is to examine how the suburban and regional characteristics in the Inland Empire influence housing and transportation choices and affordability, which impacts the overall quality of life in the region.

Followed up with the research questions:

- Is the Inland Empire affordable?
- What are the trade-offs residents select when moving to the region?
- What are the job prospects?
- What are residents' housing and transportation cost burdens in the Inland Empire?
- How can the region remain attractive to all generations?

Secondary Data: Disadvantaged Populations, Housing Burden, and Transportation Accessibility Indices

Data Sources

This study examines how historical housing and transportation inequalities in the Inland Empire continue to affect disadvantaged communities. To analyze these dynamics, three indices (disadvantaged populations, housing burden, and transportation accessibility) were developed and analyzed through a multiple linear regression model. These indices were mapped using Arc GIS and are found in Figures 2-4.

Disadvantaged Populations Index

The Disadvantaged Index combines socio-economic and demographic factors from the CalEnviroScreen 4.0 dataset to assess population vulnerability. Key variables include median household income, percentage of white population, and education levels. Adjustments were made for linguistic isolation and economic stressors like poverty and unemployment. Higher index values indicate a greater disadvantage.

Housing Burden Index

The Housing Burden Index, sourced directly from the CalEnviroScreen 4.0 dataset, is defined as the percentage of household income spent on housing costs. This single-variable index is normalized using Z-scores, reflecting the economic pressure on households due to housing expenses. Higher values indicate greater financial strain.

Transportation Accessibility Index

Transportation accessibility data from the Caltrans EQI were normalized using min-max scaling to create the Transportation Accessibility Index. This transformation standardized the data to a fixed range of 0 to 1, facilitating comparative analysis across different regions. The index aggregates normalized values for auto and multimodal access to work and nonwork activities.

Primary Data: Inland Empire Housing, Transportation, and Quality of Life Survey

The Research Challenge Team developed a survey to gather primary data from students at the University of California, Riverside (UCR) and California State University, San Bernardino (CSUSB). This 42-question survey, which was pilot-tested for refinement, aimed to assess students' perceptions of housing affordability, transportation convenience, and overall quality of life in the region. It was approved by CSUSB's Institutional Review Board and was distributed via Qualtrics to students using a random sampling method through university associations, professors, and departments. A total of 1,203 responses were collected from both institutions, providing a robust data set. The results were analyzed with cross-tabulations. Table 1 provides a breakdown of the total populations for each university, the number of surveys collected from each, and a breakdown of the student rankings. Table 1A looks at the educational attainment for both counties in comparison to the graduate rates for each university.

Table 1: CSUSB and UCR Student Population, Survey Respondents and Status by University

	CSUSB	UCR
Total Population	18,510	26,426
Number of Survey Respondents	503	670
Respondents' Status (Count)		
Undergraduate	337	643
Graduate	166	27

Source: LTC, Inland Empire Study, 2024

Table 1A: San Bernardino and Riverside County Educational Levels (2020) and University Graduation Rates (2023)

	San Bernardino	CSUSB	Riverside County	UCR
Bachelor's Degree or Higher	23.6%		26.5%	
4 yr. Graduation Rate		25%		62%
6 yr. Graduation Rate		55%		78%

Source: U.S. Census, 2024; CSUSB 2023; College Factual, 2024.

The study's primary goal was to understand the factors influencing students' decisions to remain in or leave the Inland Empire post-graduation, offering valuable insights into regional retention strategies. By identifying the drivers of outmigration and exploring approaches to attract and retain skilled professionals, the study provides policymakers and regional planners with critical information to improve housing, transportation, and quality of life, ultimately aiming to enhance regional development and upcoming professionals' retention. As the largest public universities in the region, UCR and CSUSB enroll diverse student populations. UCR has a six-year graduation rate of 78%, compared to CSUSB's 55%. Despite this, only 26.5% of Riverside County and 23.6% of San Bernardino County residents hold a college degree (Census, 2024). The question that arises is whether recent graduates of the two largest public universities remain in the region after graduation. Given the role of these universities in cultivating the region's future workforce, understanding student perceptions of the Inland Empire's livability is critical for shaping its economic and social future.

The analysis of university student populations can draw on broader migration patterns and retention strategies seen in other regions. For instance, research examining the retention and attraction of educated individuals in specific states underscores the role of socioeconomic and demographic factors in shaping movement and decision-making. Studies often utilize extensive survey data to identify key characteristics associated with migration trends, such as educational attainment, economic opportunity, and regional appeal. These patterns highlight how individuals with higher education levels may be more likely to migrate for better opportunities, a phenomenon that is often referred to as "Brain Drain" (Brown, 2022). Such

insights are valuable for policymakers looking to address workforce challenges, intending to improve both retention and attraction of skilled professionals within a given area.

3. The Housing and Transportation Balance

Households often face a delicate balance between housing and transportation costs (Litman, 2021; Miller, 2004). While individuals and families pursue homeownership for many reasons, such as financial security and independence, this milestone has long been a cornerstone of the American dream. Homeownership in the United States not only signifies stability for individuals/families and communities, but also contributes to economic growth, wealth generation, and job creation. Homeowners tend to be more engaged in their neighborhoods, from volunteering at local events to participating in civic activities, fostering a strong sense of belonging (San Diego Foundation, 2022). For historically underserved communities, the benefits of owning a home are even more profound.

However, in regions like Southern California, where housing costs are prohibitively high for many, potential homeowners often find themselves forced to "drive until they qualify." This term describes the trend of people moving further away from their workplaces to purchase more affordable homes. While this strategy may lower housing costs, it often increases transportation expenses, offsetting any savings (HUD USER, 2022). This dilemma is especially prevalent in the Inland Empire, where many residents endure long commutes that exacerbate regional accessibility and affordability issues.

The growing imbalance between housing and employment locations has led to significant challenges for the Inland Empire. Longer commutes contribute to severe traffic congestion, increased air pollution, and reduced quality of life, as residents spend more time in their vehicles. Research indicates that areas with higher levels of congestion experience lower economic satisfaction and overall quality of life among residents (Han, *et al.*, 2022). These patterns are not just inconvenient; they have tangible negative effects on both the environment and the well-being of those who call the region home.

In 2022, the Inland Empire was identified as the fifth fastest-growing region in Southern California (Rio & Rio, 2023). The metropolitan area of Riverside-San Bernardino-Ontario is the

12th most populous in the United States. This rapid expansion has further fueled housing demand, driving up costs across the region. According to the Affordable Housing Needs Report of 2022, the average monthly rent in Riverside County reached $1,971, requiring an hourly income of approximately $34.44 more than twice the state minimum wage (California Housing Partnership, 2022). In neighboring San Bernardino County, the average monthly rent stands at $1,813, necessitating an hourly wage of $34.86 to afford (Mazzella, 2022). Home values in the Inland Empire have also skyrocketed, with the typical home price reaching $535,000 in 2022, a decrease of 2.5% from the previous year, but is higher than the $387,000 national median price (Duffy, 2023). These figures underscore the pressing challenges that residents face when trying to secure affordable housing in the region.

In response to these mounting pressures, regional initiatives have begun to take shape. The Southern California Association of Governments (SCAG) is spearheading Smart Cities and Mobility Innovation Projects aimed at reducing vehicle miles traveled (VMT) and greenhouse gas (GHG) emissions, especially in areas most affected by air pollution. These efforts prioritize equity in regional land use and transportation planning, recognizing the need to address both environmental and social justice concerns. By promoting smart growth policies, SCAG and other local entities aim to increase land density while simultaneously lowering housing unit costs and reducing transportation expenses (Makarewicz, Dantzler, & Adkins, 2020).

Inland Empire cities are already making strides in smarter growth. Ontario, for instance, is advancing its "Smart Ontario" initiative, which focuses on implementing energy-efficient technologies into the city's infrastructure (City of Ontario, 2020). A few examples of the projects being implemented include the installation of electric vehicle charging stations, building out fiber optics infrastructure to support residents and businesses, and installing smart streetlights. Rancho Cucamonga is also pushing forward with two major projects: the HART District, a transit-oriented, mixed-use development designed to promote walkability and cultural engagement, and Cucamonga Station, envisioned as a multimodal transportation hub aimed at transforming the region into a key economic and travel destination (City of Rancho Cucamonga, 2020). Both of these projects will support greater public transportation connectivity for those living throughout the region.

The following section looks closely at the demographics of the Inland Empire. The region's population is both diverse and rapidly expanding, with unique socioeconomic characteristics that shape the challenges and opportunities its residents face in the housing and transportation realms. By exploring the demographic landscape, we can better assess how issues of affordability and access affect different communities and identify potential solutions that address their specific needs.

4. The Inland Empire's Demographic, Socioeconomics, Housing and Transportation Data

Community Demographics

The Inland Empire is home to roughly 4.6 million residents across San Bernardino and Riverside counties and showcases a diverse population with distinct socioeconomic dynamics. Table 2 presents the population numbers for the Inland Empire counties and three select cities from 2010 to 2040. The County and City of Riverside have larger populations compared to San Bernardino County and the cities of San Bernardino and Ontario. The projected growth of the selected communities in this table shows that the Cities of Riverside (16.6%) and Ontario (13.4%) are expected to have the greatest growth followed by the County of Riverside at 10.8%.

Table 2: Inland Empire Counties and Select Cities Population, 2010, 2020, 2030 and 2040

County/City	2010	2020	2030	2040	2020-40 Growth Rate
San Bernardino County	2,035,210	2,181,660	2,246,812	2,329,399	6.8%
Ontario City	165,215	175,945	187,381	199,561	13.4%
San Bernardino City	209,924	217,946	226,228	234,825	7.7%
Riverside County	2,189,641	2,418,185	2,516,026	2,680,111	10.8%
Riverside City	303,871	328,155	354,407	382,760	16.6%

Source: U.S. Census Bureau, 2024; California Department of Finance, 2024; SCAG, 2016.

Table 3 provides a breakdown of the race and ethnicity data for the Counties of San Bernardino and Riverside and compares it to the numbers from CSUSB's and UCR's Offices of Institutional Research. San Bernardino and Riverside Counties are predominantly Hispanic

communities, with percentage rates of 55.9% and 51.9% respectively. Yet, the two universities located in each county are not representative of their respective counties. CSUSB has a 70% Hispanic population and UCR is at 37.1%. These differences are also seen in all of the race classifications. In comparing race/ethnicity data for the regional universities, a higher percentage of Hispanic students attend CSUSB and UCR has a higher concentration of Asian students.

Table 3: Inland Empire Counties Race and Ethnicity (2020) Compared to University Enrollment at CSUSB and UCR (2023)

	San Bernardino County	CSUSB	Riverside County	UCR
White	24.5%	10.0%	31.0%	11.8%
Hispanic	55.9%	70.0%	51.9%	37.1%
Black or African American	9.4%	5.0%	7.6%	3.3%
Asian	9.3%	6.0%	8.1%	32.5%
Native Hawaiian and Other Pacific Islanders	0.5%	>1.0%	0.5%	>1.0%
Two+ Races	3.8%	3.0%	3.9%	4.9%

Source: U.S. Census, 2024, CSUSB Institutional Research, n.d., and UCR Institutional Research, n.d.

These demographic patterns not only highlight the racial and ethnic differences between San Bernardino and Riverside Counties but also set the stage for understanding the perspectives of the region's future workforce.

Survey Respondents Demographics

Tables 4A and 4B provide a detailed breakdown of the respondents' demographics. The respondents from CSUSB had a broad age distribution, with 31.5% in the 18-23 age range, 27% within the 24-29 years old category, and 34.1% aged 30 or older. In terms of racial and ethnic representation, Hispanic students constitute the majority at 59%, followed by white (23%) and Black (9.4%) students, reflecting a significant presence of underrepresented minorities. A large number (69%) of female students responded to the survey at CSUSB. Parents' education levels indicate that 33% of mothers and 36.3% of fathers have only some grade school education, which aligns with the university's service to first-generation college students. There was economic diversity for the CSUSB respondents, with 36.5% earning less than $15,000 annually, and 12.5%

earning $75,000 or more. Additionally, a strong local connection is evident, with 60.2% of respondents born or raised in the Inland Empire and 91.8% currently residing in the region.

The University of California, Riverside (UCR) respondents were predominantly a young demographic, with 93% of respondents aged between 18-23. The racial composition shows a significant Asian representation at 42.7%, followed by Hispanic (35%), with white (14.2%) and Black (6.3%) students making up smaller portions. Gender representation leans towards female students, comprising 64% of respondents, while non-binary respondents account for 2.5%. Educational backgrounds of parents show that 29% of mothers and 25.5% of fathers hold a bachelor's degree or higher. Economically, a large majority (75.9%) report earning less than $15,000 annually, typical for full-time college students. Connection to the Inland Empire is relatively low, with only 31.4% born or raised in the area, although 77.2% currently reside there.

Table 4A: Survey Respondents' Age, Race/Ethnicity, and Gender, 2023

	CSUSB	UCR
Respondents Age Range		
Under 18	0.4%	0.5%
18 - 23	31.5%	93.0%
24 - 29	27.0%	4.1%
30 - 35	17.1%	1.4%
36 - 40	7.7%	0.8%
40 or older	16.3%	0.2%
Respondents Race/Ethnicity		
White Non-Hispanic/Latino	23.0%	14.2%
Hispanic	59.0%	35.0%
Black or African American	9.4%	6.3%
Asian	8.4%	42.7%
Native American or Alaska Native	2.4%	0.9%
Native Hawaiian or Pacific Islander	0.9%	0.8%
Other	2.4%	5.5%
Prefer not to say	4.5%	3.2%
Respondent's Gender		
Male	24.8%	31.2%
Female	69.8%	64.0%
Non-binary	2.6%	2.5%
Prefer not to say	2.8%	2.2%

Source: LTC, Inland Empire Study, 2024

Table 4B: Survey Respondents' Education Level for Parents and Respondent's Income, 2023

	CSUSB	UCR
Parent's Education Level (Mother)		
Some grade school	33.0%	17.5%
HS Diploma	36.5%	27.1%
Associate	10.0%	9.6%
Bachelor	11.1%	29.0%
Master	8.3%	14.5%
PhD	1.1%	2.4%
Parent's Education Level (Father)		
Some grade school	36.3%	20.0%
HS Diploma	37.2%	27.0%
Associate	7.0%	8.3%
Bachelor	12.8%	25.5%
Master	5.1%	14.1%
PhD	1.5%	5.1%
Respondent Income Level		
Less than $15,000	36.5%	75.9%
$16,000 - $25,000	16.8%	10.3%
$26,000 - $40,000	14.3%	5.7%
$41,000 - $55,000	11.0%	1.0%
$56,000 - $74,000	8.9%	2.4%
$75,000 or above	12.5%	4.7%

Source: LTC, Inland Empire Study, 2024

Comparison of the Community with the Survey Respondents

CSUSB respondents exhibit a wider age distribution than UCR, with 34.1% aged 30 or older, reflecting the presence of non-traditional students. In contrast, UCR respondents are predominantly aged 18-23 (93%), indicating a younger, more traditional student body compared to regional trends. CSUSB's racial makeup closely aligns with San Bernardino County, particularly for Hispanic (59% vs. 56%) and Black or African American populations (9.4% vs. 5%). UCR's demographic composition features a large Asian student population (42.7%), significantly higher than Riverside County's 6.9%, while Hispanic and white populations are less presented. Overall, while both UCR and CSUSB reflect certain regional demographics, CSUSB aligns more closely with the ethnic composition of its area, and UCR attracts a more diverse and younger student body.

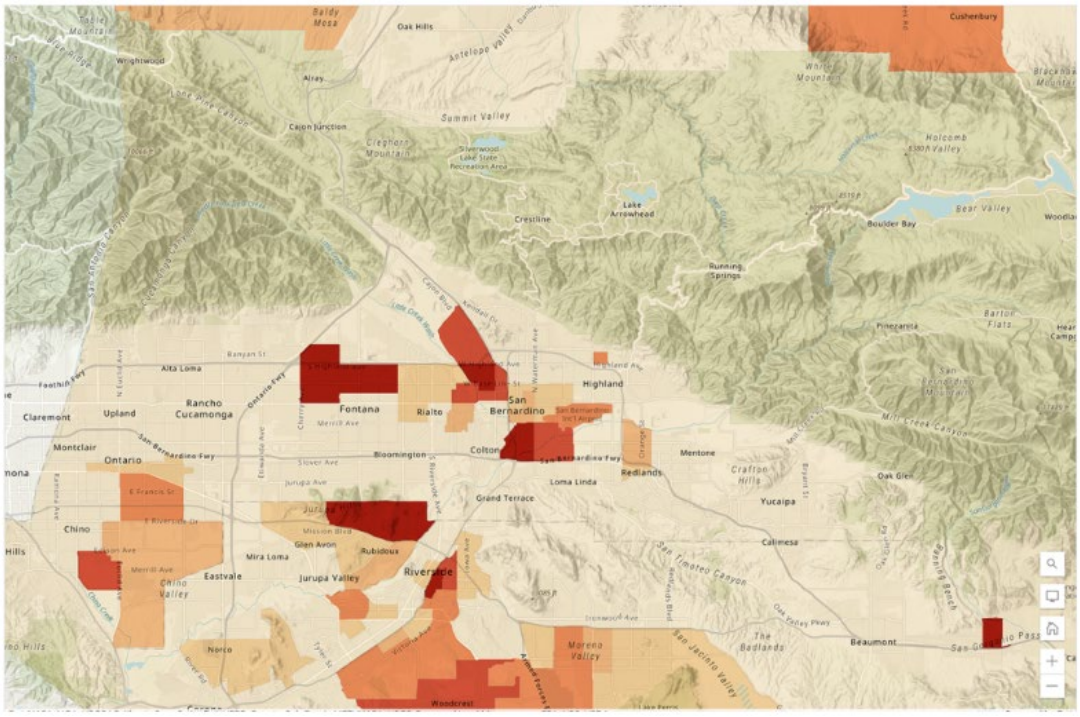
Furthermore, CSUSB has a stronger connection to the Inland Empire, with a higher percentage of students born and residing in the region compared to UCR, which tends to draw more students from outside the area.

Historical Socioeconomics of the Region

A community's history impacts its current development. This section looks briefly into historical practices, like redlining, that influenced current housing and transportation issues. These discriminatory policies have shaped the socioeconomic status of communities and created barriers for minority populations throughout the United States. For this study, we compared the IE's historical demographic map of Black populations with the socioeconomic index to see possible connections. We begin with a short review of redlining.

A historical practice that has shaped the housing and transportation landscape in the United States is redlining. The Homeowner Loan Corporation (HOLC) and the National Housing Act, implemented in the 1930s, aimed to promote homeownership and reduce foreclosure rates. However, they used socioeconomic status to determine neighborhood desirability, leading to long-lasting economic and social consequences (Winling & Michney, 2021). Redlining practices restricted many minority homeowners from accessing affordable housing and obtaining loans for property improvements. These practices resulted in segregated neighborhoods, increased poverty, and limited economic mobility, particularly impacting African American communities (Aaronson, *et al*., 2021). The Inland Empire, like many other U.S. regions, has a history of unofficial redlining in transportation and housing inequalities that persist today (History, n.d.; Tilton, 2023; Langley, 2023).

Figure 1: Inland Empire's Black Residents in the 1970s



Source: Langley, 2023

As seen in Figure 1, the concentration of Black residents in the 1970s and 1980s are seen in San Bernardino's west side, Colton's west side, and north side of Fontana. Housing segregation and redlining prevented many minority homeowners from achieving permanent ownership or improving their properties, resulting in crime, poverty, lack of economic mobility, neighborhood decline, and decreased home values (Langley, 2023; Tilton, 2023). The literature suggests that the legacy of redlining continues to impact housing affordability and transportation efficiency in the Inland Empire as seen in Figure 2.

Figure 2 maps the disadvantaged index by census tract developed from socioeconomic and demographic data from the CalEnviroScreen 4.0 dataset. The map uses a three-color-coded scheme to indicate varying levels of disadvantage. The purple area shows higher concentrations of disadvantaged communities, characterized by significant socioeconomic challenges. The green areas are moderately disadvantaged, and the yellow areas have the lowest levels of disadvantage. Disadvantaged communities are identified as areas where the median household

income is less than 80% of the statewide annual median income. Severely underserved communities include those with a median household income below 60% of the statewide median. These communities face multiple challenges, including limited job opportunities, low educational attainment, and extended commutes, which worsen income disparities. Additionally, these areas often include socioeconomically disadvantaged individuals, people of color, ethnic, and national origin minorities, and those with limited English proficiency. Looking at Figures 1 and 2 comparatively, we can see the overlap in historical inequities and current high concentrations of disadvantaged communities.

Figure 2: Socioeconomic Disparities in IE: Disadvantage Index

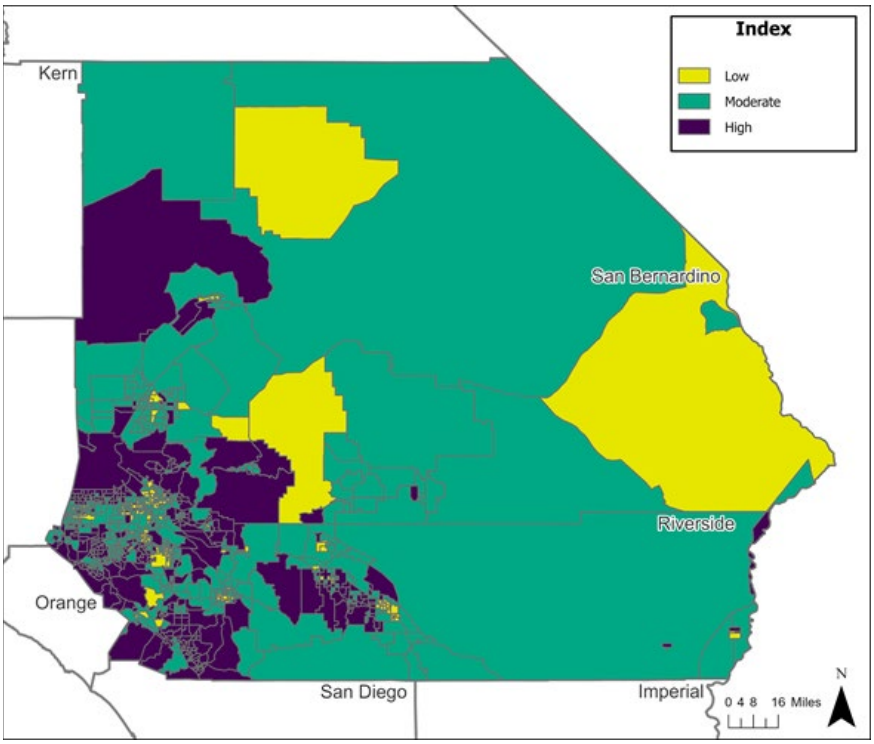


Table 5 provides the comparative income, poverty and educational rates for San Bernardino County, Riverside County, and California. San Bernardino County's median household income is $85,069, slightly below the state average of $95,521, while Riverside County's income levels are closer to the state median at $90,571 (U.S. Census Bureau, 2024). Poverty levels are also higher in San Bernardino, where 13.1% of the population lives below the poverty line, compared to 11.3% in Riverside (U.S. Census Bureau, 2024). Child poverty rates in San Bernardino

are particularly concerning, with 17.5% of minors living in poverty, highlighting ongoing socioeconomic disparities in the region (U.S. Census Bureau, 2024). Educational attainment remains a challenge in the Inland Empire, where only 23.6% of adults in San Bernardino County and 26.5% in Riverside County have earned a Bachelor's degree or higher (U.S. Census Bureau, 2024). The IE counties are behind the state averages for all of the data except Riverside County has a lower poverty rate. This lag in educational engagement, combined with economic challenges, suggests structural barriers that limit social mobility.

Table 5: Income, Poverty and Education Rates in the Inland Empire Counties and California, 2023

	San Bernardino	Riverside	California
Median Household Income	$85,069	$90,527	$95,521
Persons in Poverty	13.1%	11.3%	12.0%
Bachelor's Degree or Higher	23.6%	26.5%	38.5%

Source: U.S. Census Bureau, 2024

The Riverside-San Bernardino-Ontario Metropolitan Statistical Area (MSA) presents a complex landscape of employment opportunities that starkly contrasts with the income required to afford average rents in the region. As residents navigate the job market, they encounter significant disparities between available positions and the financial demands of housing. According to the U.S. Bureau of Labor Statistics (2023), the top industries in the MSA are Transportation & Material Moving, Office & Administration Support, Food Preparation & Serving, Sales, and Healthcare Support. Table 6 provides the top industries with the median hourly wages and shows that the median wage for the top five industries by number of jobs is between $21.48 and $14.49. This situation creates a pressing need for effective economic development strategies aimed at improving wage growth across key sectors, ultimately addressing the challenges of housing affordability and job quality that residents face.

Table 6: Riverside-San Bernardino-Ontario MSA Number of Jobs and Median Hourly Wage in Major Industries - May 2022

Major Industry	# of Jobs	Median Hr Wage
Transportation & Material Moving	166,283	$21.13
Office & Admin Support	111,110	$21.48
Food Prep & Serving	95,363	$15.82
Sales	83,280	$16.89
Healthcare Support	66,849	$14.49
Education	58,073	$31.32
Healthcare Practitioners	53,272	$47.94
Construction	50,260	$28.53
Production	48,367	$18.45
Business & Financial Operations	41,762	$33.94
Community & Social Services	16,432	$27.76
Architecture & Engineering	9,301	$40.64
Arts & Entertainment	8,186	$23.54
Farm, Fish, & Forestry	4,819	$16.32
Legal	3,253	$49.72

Source: U.S. Bureau of Labor Statistics - (May 2022) Metropolitan and Nonmetropolitan Area Occupational Employment and Wage Estimates: Riverside-San Bernardino-Ontario, CA

Table 6A is an analysis of Table 6 per the Living Wage Calculator at MIT (Glasmeier and MIT, 2024). The living wage for a few household scenarios in San Bernardino and Riverside Counties were analyzed. In San Bernardino County, one working adult with one child needs to earn $41.45 per hour to be considered a living wage. The same household hourly wage is $43.38 in Riverside County, indicating Riverside is a bit more expensive to live in than San Bernardino. For this category, only 6.9% of the jobs in the region pay this amount or more. For two working adults with two children, the hourly rate is $28.78-$30.13 per hour; 13.2% of the jobs pay this amount or more. Finally, for one working adult with no children, the hourly living wage is $25.17-$26.30 per hour. In this scenario, we see that 14.8% of the jobs pay this amount or more. The largest percentage of jobs, 71.5%, pay less than $25 per hour. This distribution highlights the ongoing challenges in the region concerning job quality and housing affordability. The

predominance of lower-wage industries means that many individuals must either work multiple jobs, families experience overcrowded living conditions, or seek higher-paying opportunities outside the IE. This third option leads to longer commutes and additional economic hardships for many residents. The job market's structure in the Inland Empire highlights the need for economic development strategies that enhance wage growth within the region's major industries.

Table 6A: Living Wage Characteristics by Number and Percentage of Jobs in the IE

Living Wage Characteristics (San Bernardino and Riverside Counties)	Number of Jobs	Percent of Jobs
$41.45-$43.48 + one working adult with one child	56,525	6.9%
$28.78-$30.13 + two working adults with two children	107,588	13.2%
$25.17-$26.30 + one working adult with no children	121,008	14.8%
Jobs that pay less than $25 an hour	584,257	71.5%

Source: Glasmeier and MIT, 2024; Authors' calculations from BLS data found in Table 6.

Housing Characteristics

There are currently 731,899 housing units in San Bernardino County with a homeownership rate of 62.8% (U.S. Census, 2024). Home values between $500,000-$999,999 made up 46.5% of the housing stock. In Riverside County, there are 848,549 housing units with a 69.1% homeownership rate. The majority of the homes (55.6%) were valued between $500,000-$999,999. There are more homeowners in the IE when compared to the state average of 55.9% (U.S. Census, 2024). The median gross rent cost was $1,831-$1,871 for the region (U.S. Census, 2024). This is slightly lower than the state median of $1,992.

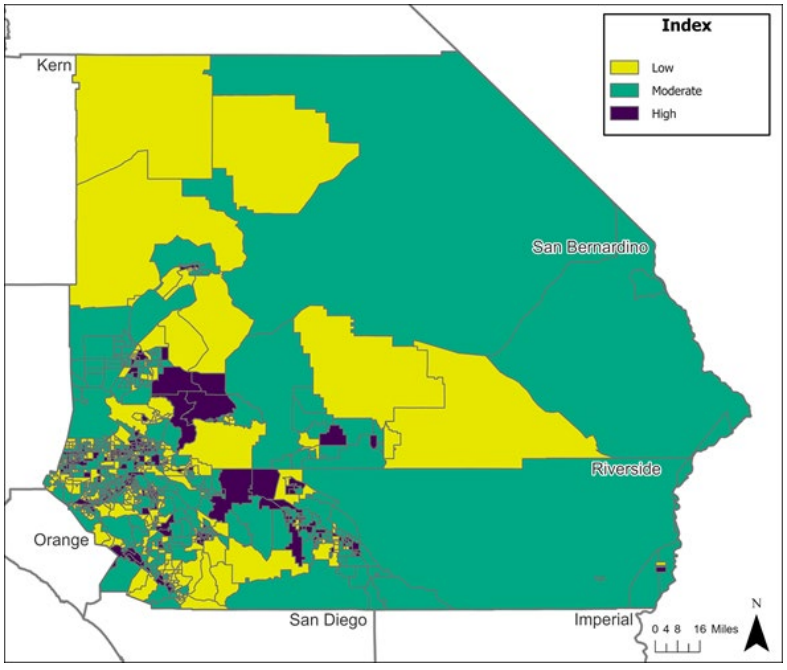
The Inland Empire has been known as a bedroom community for neighboring counties, with housing historically more affordable. The median price of a home in the IE was $354,450 in 2019. This was roughly 54% of the median price for Orange County or 48% of the median Los Angeles County price (Rose Institute, 2019). While housing in the Inland Empire is relatively more affordable than in coastal locations in Los Angeles, Orange, and San Diego Counties, the costs remain a significant challenge for many residents. Housing affordability is assessed based on whether housing costs exceed 30% of gross household income, a common benchmark in the

United States. As noted above the median home price in the IE was $535,000 in 2022, a significant cost for communities earning a median household income of $81,041 (DataUSA, 2022).

As mentioned, the IE population is projected to grow to almost 5 million people by 2030 (Table 2). With this population growth, there will be increased demand for new housing. New units are being built, but it is important to note that a significant number of investors are in the region (Bindman, 2024), creating pressure on the local supply of homes and increasing costs further. Per data from Redfin as cited by Bindman (2024), homebuyers in the Inland Empire need to make about $73 per hour to afford the median home price in the region.

Figure 3 displays the Housing Burden Index for the Inland Empire, using the same color-coded scheme as Figure 2. The areas in purple represent regions with the highest housing burden, where residents face significant challenges related to housing costs. The green areas indicate a moderate level of burden, and the yellow areas show regions with the lowest levels. The highest levels of burden are seen in the Riverside metro region, the west side of San Bernardino County, and areas in the high desert region.

Figure 3: **Housing Burden Index Visualization**



The housing characteristics of the region were further analyzed with the 4th and 5th Cycle Regional Housing Needs Assessment (RHNA) allocations and the number of housing units

produced in San Bernardino and Riverside Counties. The RHNA allocations are part of a state-mandated process in California that requires cities and counties to plan for their housing needs over an eight-period, addressing the demand for housing across various income levels. Table 7 shows that the number of housing units constructed is less than the allocations for both counties during both cycles. Reasons for the discrepancy in the goals set and the reality of the number of units constructed are complex. Some would state that the original allocations were unrealistic. Others note that the actual construction of homes is done by the private sector, not government agencies. What is clear is that there are not enough homes being constructed to meet the need. This has caused a crisis throughout California, and the IE region is not immune. These housing pressures are further seen in the respondents of our survey.

Table 7: RHNA Allocation vs Number of Units Built in San Bernardino and Riverside Counties, 4th and 5th Cycles

	RHNA	(2006-2012)	Change	RHNA	(2013-2021)	Change
San Bernardino County	107,544	39,998	37%	57,207	22,140	39%
Riverside County	174,706	81,959	47%	101,374	43,890	43%

Source: SCAG per the Inland Center for Sustainable Development, 2021

Housing Characteristics for the Survey Respondents

This section begins with questions regarding residency for the student respondents. The first half of Table 8 shows where students resided before enrolling in university and the second half provides their current living conditions. A large majority (72.8%) of the students at CSUSB came from the region. This compares to about a third of the students from UCR who previously resided in the IE. A bit more than 45% of the student respondents from UCR came from Southern California communities.

The current housing conditions are not surprising for those who know both institutions. At CSUSB, 7.6% of the respondents lived on campus compared to 36.3% who lived on campus at UCR. A large percentage (41.6%) of the CSUSB students and 22.6% of the UCR students indicated they lived with family or relatives. A notable number is that 1.2% of the CSUSB students stated that they were homeless. Finally, 27.4% from CSUSB and 34.9% from UCR rented a place off-campus, and 19.1% and 5.7% respectively owned a place off-campus.

Table 8: CSUSB and UCR Student Previous and Current Residence

	CSUSB	UCR
Previous Place of Residence		
Inland Empire	72.8%	29.8%
Southern California	19.5%	45.7%
Central California	0.4%	1.9%
Northern California	2.6%	14.5%
Other U.S. State	0.8%	2.2%
International Location	4.0%	5.8%
Current Housing Situation		
On-campus	7.6%	36.3%
Off-campus (rented)	27.4%	34.9%
Off-campus (owned)	19.1%	5.7%
With Family/Relatives	41.6%	22.6%
Homeless	1.2%	0.0%
Other	3.2%	0.4%

Source: LTC, Inland Empire Study, 2024

Table 9 explores the students' perspectives on housing affordability. The lack of affordable housing in the IE was seen as very significant or significant for 85.2% of the CSUSB respondents and 71.3% from UCR. When asked about their current housing costs, only a quarter from both CSUSB and UCR indicated it was very affordable or affordable. Around 50% of the CSUSB students indicated that affording rent over the past year was difficult to very difficult.

Table 9: CSUSB and UCR Student Housing Affordability

	CSUSB	UCR
Perception of Housing Affordability in the IE is a Significant Problem		
Very Significant	62.8%	30.3%
Significant	22.4%	41.0%
Neutral	8.7%	23.0%
Insignificant	1.0%	3.3%
Very Insignificant	5.1%	2.4%
Affordability of Current Housing Costs		
Very Affordable	6.7%	5.6%
Affordable	18.0%	20.7%
Neutral	27.7%	41.3%
Unaffordable	28.9%	24.7%
Very Unaffordable	18.6%	7.7%
Ease of Affording Rent the Past Year		
Very Easy	6.1%	6.4%
Easy	8.1%	10.2%
Neutral	34.9%	52.0%
Difficult	30.5%	24.8%
Very Difficult	20.4%	6.7%
Actions Taken Due to Difficulties Paying Rent or Mortgage		
Take an additional job or work more at their current job	51.4%	41.2%
Stop savings for retirement	46.3%	16.6%
Accumulate credit card debt	62.8%	20.7%
Cut back on healthy nutritious food	53.2%	39.4%
Cut back on healthcare	23.0%	16.1%
Move to a neighborhood that you feel is less safe	16.5%	9.7%
Move in with roommates	19.5%	50.9%
Not sure	5.1%	14.7%
Monthly Housing-Related Expenses		
$0-625	30.2%	30.0%
$626-1,250	23.4%	35.9%
$1,251-1,875	16.5%	24.4%
$1,876 or Above	29.8%	9.7%

Source: LTC, Inland Empire Study, 2024

We also asked the respondents what actions they take to afford the cost of housing. They were allowed to pick more than one action, therefore the percentages do not add to 100. At CSUSB more than 60% stated they take on more credit card debt, and more than 50% noted they cut back on nutritious food or work more. For UCR, approximately 50% said they would move in with roommates and 41.2% said they would work more.

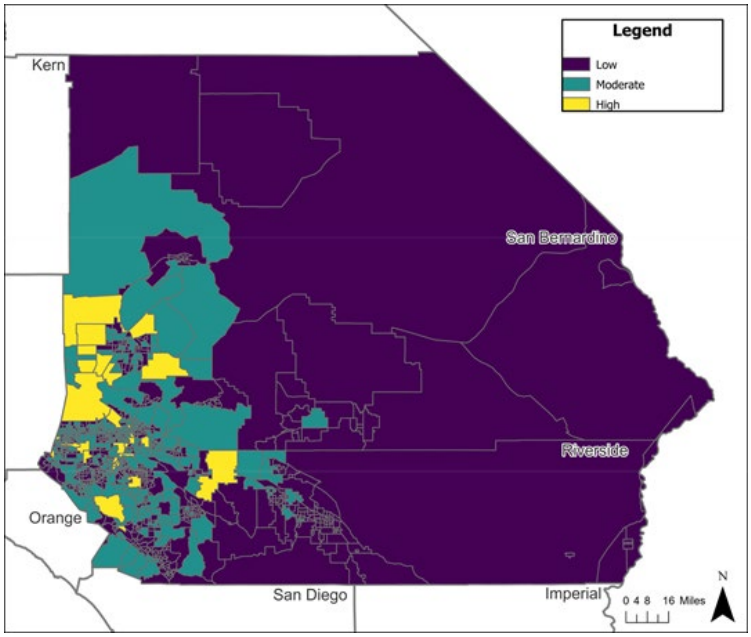
The next section explores transportation costs in the Inland Empire through secondary data analysis and the perspectives of the students. Housing and transportation are two of the largest costs for households and are linked as the location of where you live to where you study, work, shop, and find entertainment all have costs. A review of the variables in the next section leads us further to understand the research question -- "Is the IE affordable?"

Transportation Accessibility

As Southern California housing costs continue to push residents farther from job centers, transportation plays a crucial role in shaping daily life in the Inland Empire. Long commutes, heavy reliance on personal vehicles, and increasing freight traffic from the region's growing logistics sector contribute to congestion, air quality concerns, and rising transportation costs (Hagen, n.d.; Victoria, 2022). Understanding how transportation infrastructure, accessibility, and commuting patterns impact affordability and quality of life is essential to addressing regional challenges.

Figure 4 visualizes transportation accessibility across the Inland Empire with an inverted color scheme compared to Figures 2 and 3. Transportation accessibility is seen as equitable access to affordable and reliable transportation options, supporting social and economic opportunities for all community members. The purple areas are the largest portions of the map and show the lowest transportation accessibility scores. This is due to challenging geographical features such as mountains and desert areas, which restrict transportation options. The green areas have moderate transportation accessibility, providing some level of access but not as extensive as higher-scoring regions. The yellow areas have high transportation accessibility, where residents have improved access to transportation networks and services.

Figure 4: Transportation Accessibility Scores



As in most communities, transportation accessibility in the IE is critical, especially for underserved communities. However, many IE residents allocate 25% of their income to transportation expenses, significantly exceeding the recommended threshold of 15% of household income (CNT, n.d.; BTS, 2023). This disparity highlights ongoing challenges in achieving equitable transportation access and affordability.

According to the Center for Transit-Oriented Development and Center for Neighborhood Technology (2006), proximity to better transit services in the central cities, access to more jobs, and the availability of some lower-priced housing improves the overall cost of living. The research concluded that neighborhood characteristics influence how much is spent on transportation and how many vehicles are owned, given that the characteristics of a place also shape transportation demand. Additionally, land use factors such as regional accessibility, density, mixed-use development, network connectivity, roadway designs, transit quality, and accessibility significantly affect residents (Litman, 2023). Access to quality transit services increases ridership and reduces automobile trips. Residents of transit-oriented neighborhoods tend to own 10-30% fewer vehicles, drive 10-30% fewer miles, and use alternative modes 2-10 times more than those in automobile-oriented areas. Additionally, mixed-use land reduces vehicle travel and increases

the use of alternative modes, particularly walking, typically resulting in 5-15% less vehicle travel. (Goldstein, Holtzclaw, & Litman, 2006).

Though widely known for anyone who resides in the region, the reliance on cars to travel in Southern California is seen in Table 10. The majority of people in the three major Metropolitan Statistical Areas (MSA) drove alone. In the Riverside-San Bernardino-Ontario MSA, the largest concentration of individuals who commuted to work or drove alone was 73%. This is higher than the Los Angeles-Long Beach-Anaheim MSA, which had 63%, and San Diego-Chula Vista-Carlsbad at 64%. More individuals in both of these MSAs were able to telecommute (21% and 22% respectively) as opposed to the Riverside-San Bernardino-Ontario MSA (14%). This lower telecommuting rate reflects the region's workforce composition, which includes a higher proportion of essential workers who were required to be on-site during the peak of the COVID-19 pandemic.

Table 10: Southern CA: All Travel Modes by Metropolitan Statistical Area (2023)

Travel Modes	Riverside-San Bernardino-Ontario	Los Angeles-Long Beach-Anaheim	San Diego-Chula Vista-Carlsbad
Drove Alone	73.1%	67.1%	67.7%
Carpooled	11.8%	9.7%	8.2%
Public Transit	0.7%	3.3%	2.1%
Bicycle	0.3%	0.5%	0.5%
Walked	1.4%	2.4%	3.8%
Other	1.3%	1.9%	1.8%
Telecommuted	11.4%	15.0%	16.0%

Source: U.S Census, 2023

These data show the reliance on driving alone among Inland Empire residents compared to other modes of transportation. This reliance correlates with longer average commute times in the region. Specifically, while the Los Angeles metropolitan area reports an average commute time of 30.3 minutes, the San Diego metro averages 25.7 minutes. In contrast, the Riverside metro area experiences a higher average commute time of 33.2 minutes (U.S. Census, 2023). This comparison highlights the impact of occupational structure and transportation reliance on commute times in different urban areas.

Survey Respondents' Transportation Preferences

Table 11 provides the percentage of respondents commuting to school, the typical commute mode to work or school, and the rate of respondents who frequently used modes of public transportation. Students at CSUSB are more likely to commute to school than UCR, with 76.6% and 47.5% respectively indicating "yes" that they commuted. Of these respondents, 78.3% of the CSUSB and 44.3% of the UCR students drove alone. A fairly significant percentage (29.6%) of the UCR students indicated that they walked to school—compared to only 5.6% of the CSUSB students. The percentage of students who rode public transit was similar for both campuses, around 5%. Of the students who indicated they took public transportation, more from UCR stated that they rode the local bus service (23.3%), compared to CSUSB (12.0%).

Table 11: CSUSB and UCR Commuting Patterns

	CSUSB	UCR
Percentage of Respondents Commuting to School		
Yes	76.6%	47.5%
No	23.4%	52.5%
Typical Commute Mode to Work or School		
Drive alone	78.3%	44.3%
Carpool	4.6%	7.7%
Uber/Lyft	0.8%	2.0%
Public transit (bus, train, etc)	5.6%	5.0%
Bike/scooter	1.0%	9.8%
Walk	5.6%	29.6%
Other	4.2%	1.7%
Frequently Used Modes of Public Transportation		
Commuter Rail (i.e., Metrolink/Arrow, Amtrak)	9.4%	11.9%
Local Bus Services (i.e., Omnitrans, RTA)	12.0%	23.3%
None of the above	81.2%	71.0%

Source: LTC, Inland Empire Study, 2024

In looking further into the reasons regarding ridership on public transportation, we asked students about their perspectives regarding accessibility and convenience, their awareness of the system benefits, and overall satisfaction with options and infrastructure (Table 12). There are similar distributions from both campuses regarding the perceptions of the accessibility and convenience of public transportation, yet more students at UCR indicated it was accessible. Close to a quarter of the students from both campuses were not aware of the free public transit services available to students. Finally, approximately 50% of the students at both campuses were neutral regarding their satisfaction with the transportation options and infrastructure in the region. Unfortunately, we do not have further information regarding these data. It would be interesting to understand why so many individuals are neither satisfied nor unsatisfied. Is it an acceptance that this is the way things just are or possibly other reasons?

Table 12: CSUSB and UCR Perceptions of Public Transit

	CSUSB	UCR
Perceptions of Accessibility and Convenience of Public Transit		
Accessible/Convenient	15.8%	20.3%
Somewhat Accessible/Convenient	25.0%	34.8%
Neutral	20.2%	23.3%
Somewhat Inaccessible/Inconvenient	22.4%	16.5%
Inaccessible/Inconvenient	16.8%	5.0%
Awareness and Utilization of Free Public Transit Service		
Yes, I am aware and have utilized the free public transit service.	24.7%	32.2%
Yes, I am aware but have not used the free public transit service.	49.4%	40.0%
No, I was not aware of the free public transit service.	25.9%	27.8%
Satisfaction with Transportation Options and Infrastructure in the IE		
Very Satisfied	1.8%	2.6%
Satisfied	15.7%	23.7%
Neutral	50.9%	55.5%
Unsatisfied	19.5%	14.6%
Very Unsatisfied	12.1%	3.6%

Source: LTC, Inland Empire Study, 2024

Survey Respondents' Quality of Life in the Region

This study thus far has focused on understanding housing affordability and transportation efficiency and the challenges for those living in the region. The final set of data that we looked at was upcoming professionals' perceptions of the region's quality of life. Table 13 provides the ratings for the overall quality of life in the region and the likelihood of recommending the I.E. as a place to live. As we can see from these data, close to 30% of the CSUSB students ranked their quality of life as poor/very poor compared to 14% of the students at UCR. Less than 50% of the CSUSB students saw it as acceptable, while 61.6% of the UCR students found it acceptable. In recommending it as a place to live more CSUSB students would recommend it compared to the respondents from UCR. This is an interesting dichotomy for the region that needs more research to understand these conflicting views.

Table 13: CSUSB and UCR Quality of Life Perceptions

	CSUSB	UCR
Rating of Overall Quality of Life		
Very Good	3.9%	1.7%
Good	18.9%	22.5%
Acceptable	47.7%	61.6%
Poor	21.9%	12.4%
Very Poor	7.5%	1.7%
Likelihood of Recommending the IE as a Place to Live		
Very Likely	4.9%	2.5%
Likely	22.1%	20.0%
Neutral	38.4%	42.2%
Unlikely	21.2%	28.5%
Very Unlikely	13.3%	6.8%

Source: LTC, Inland Empire Study, 2024

5. Discussion

Overview of the Major Findings:

- The population in the IE is relatively **young** and most of the population is **Hispanic/Latino.**
- As projected, **305,461 more housing units** are needed to meet the region's future population.
- People are moving to the Inland Empire from different counties at a higher rate of 4% versus the others at 2%.
- The IE is affordable **if** the hourly wage is 2.3x more than the CA minimum.
- In 2022, the IE had 750,784 jobs from major industries that **did not** meet the hourly income needed to afford to live in this region.
- Due to the need for more quality jobs in the region, residents are commuting **further and longer** to other metropolitan areas and cities.
- One of the consequences of commuting from further distances is that residents become **car-dependent** and choose to drive alone instead of carpooling or using public transit.
- Because the IE residents are car-dependent, public transit ridership has **decreased** in the last few years.
- IE residents **spend approximately 25% of their income on transportation costs** more than any other metropolitan area in Southern CA.
- Overall, IE residents **spend on average 57% of their income on housing and transportation costs**, making the region **unaffordable**.

Takeaways

- Housing and transportation costs usually increase the further you move away from central areas.
- The Inland Empire is falling behind in housing, jobs, transportation services, and options.

- Bringing quality jobs to where people live in the region, is just as essential, as bringing houses to jobs.
- The region needs to secure additional state and federal funding and programs to address the challenges faced by its residents.
- Regional leaders must work together to foster alternative futures for the region.

The interpretation of secondary and primary data findings reveals the critical challenges of housing affordability and transportation efficiency in the Inland Empire. Secondary data indicates that high transportation costs and limited access compound the challenges experienced by disadvantaged residents in the Inland Empire. Policies that reduce the housing burden and improve transportation accessibility can directly impact and potentially lessen the degree of disadvantage in affected communities. Disadvantaged communities face increased financial strain, limiting their access to essential opportunities and contributing to persistent poverty cycles in the Inland Empire. Investments in public transportation, promoting mixed-use development, and supporting affordable housing close to employment hubs will reduce economic and social isolation in the IE. The Inland Empire faces significant disparities in housing and transportation, exacerbating challenges for underserved populations. To address these issues, policymakers can adopt a nuanced approach that prioritizes affordable housing, integrates transportation development, involves communities in decision-making, and safeguards against gentrification.

Survey results from California State University, San Bernardino (CSUSB) respondents indicated a higher transportation and housing burden than University of California Riverside (UCR) respondents. Public transportation is perceived to be more accessible by UCR respondents, who also rate their quality of life more favorably than CSUSB respondents. However, respondents from both universities are equally likely to recommend the Inland Empire as a place to live. These findings indicate an urgent need for comprehensive strategies to address the immediate issues related to housing costs and public transportation accessibility and tackle the underlying socio-economic disparities that lead to inequalities within the community.

6. Recommendations and Conclusion

Housing affordability and transportation efficiency in the Inland Empire are complex and interconnected, impacting the quality of life for upcoming professionals. Despite hosting higher-education institutions, the region still has a low percentage of residents with higher education, raising concerns about the impact of housing and transportation dynamics on well-being and overall quality of life. The finding highlights the need for strategies addressing housing burden, commute time, and socioeconomic disparities.

This research study emphasizes the importance of strategies that promote equity, sustainability, and inclusivity in urban development. Ongoing community engagement, data-driven decision-making, and policy innovation are crucial to address the needs of marginalized and underserved populations. The findings underscore the importance of ongoing monitoring and evaluation to track progress, identify emerging trends, and adapt to improve the quality of life in the Inland Empire.

7. Acknowledgements

The Research Challenge Team thanks the Leonard Transportation Center at California State University, San Bernardino, University of California, Riverside, and California Polytechnic State University. A special thanks to Dr. Kimberly Collins, our research executive director. Additionally, a sincere appreciation for the collaborative efforts and guidance from our Faculty Team advisory members- Dr. Raffi Der Wartanian, Mr. Rick Bishop, and Dr. Youngping Zhang. Their support and learning opportunities have been invaluable.

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