City of Tempe
Housing Inventory and Affordability Analysis

Prepared for:

City of Tempe Human Services Department

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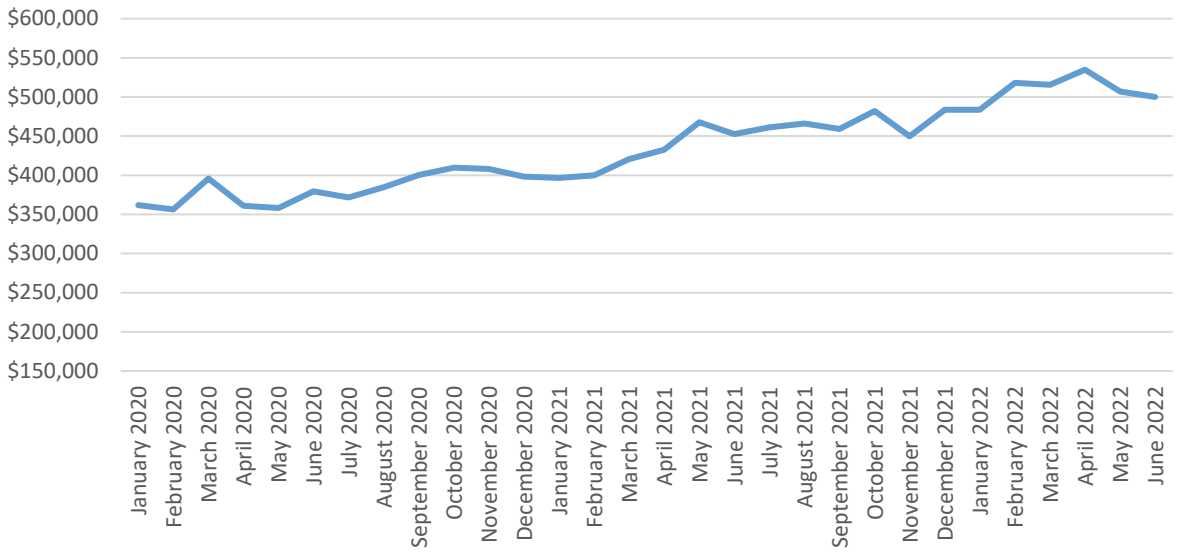
Executive Summary

In July 2022, the City of Tempe contracted with Matrix Design Group, Inc. (Matrix) to conduct a housing and affordability analysis update. Matrix completed the most recent iteration of the analysis in 2020. The primary purpose of the study is to help the community understand the distribution and categorization of the city's occupied housing stock as it relates to quantity and affordability.

The findings primarily rely on the latest edition of the American Community Survey, which covers the five-year period from 2016 to 2020. In the time since then, the housing market has exhibited extreme volatility, marked by soaring home sale prices and rents that are not simply artifacts of the broader inflationary crisis (see Figures 1 and 2).[1] Between January 2020 and June 2022, the median home sale price increased by 38%. During a similar timeframe, average multifamily gross rent rose by 13%. While it would have been ideal to have access to 2021 and 2022 data for the study's core analyses, the results reflect the best available information for policymakers and others interested in a comprehensive evidence-based assessment. A synopsis of the findings appears below.

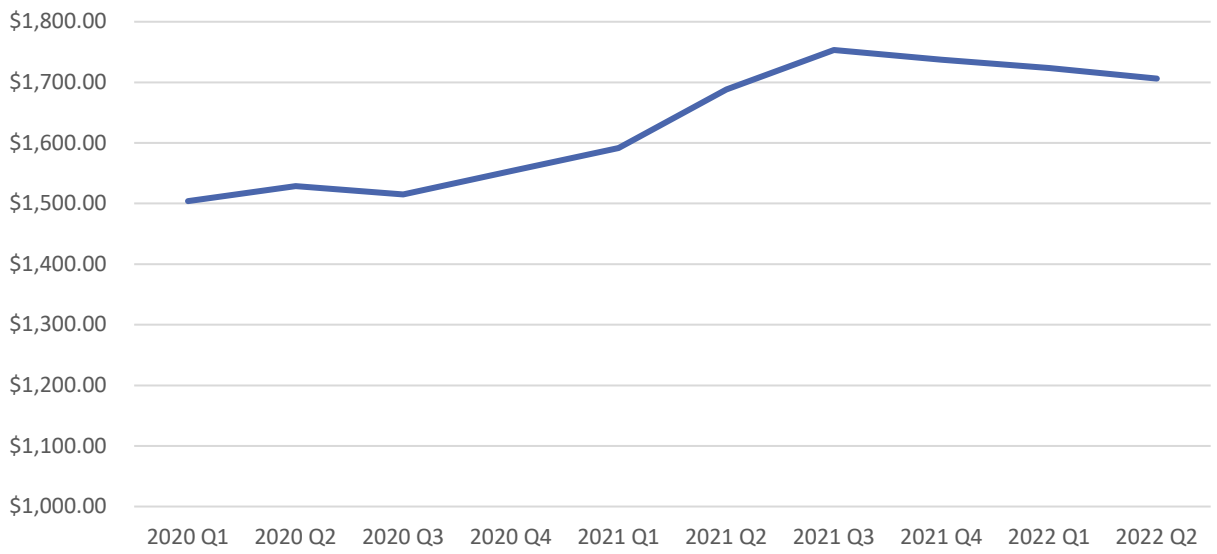
Figure 1. Median Home Sale Price in Tempe, January 2020 to May 2022



***Note**: Values adjusted for inflation to constant June 2022 dollars.*
***Source:** Redfin.*

[1] Figures 16, 29, 30, and 31 put the magnitude of the price increases into greater historical context.

Figure 2. Average Quarterly Rent in Tempe, 2020 Q1 to 2022 Q2



***Note**: Values adjusted for inflation to constant 2022 Q2 dollars.*
***Source:** CoStar.*

What is the inventory of homes (owner and rental) in Tempe and its zip codes by affordability category?

In general, Tempe's housing stock is middle-class oriented, but certain neighborhoods, specifically those in zip code 85284, cater to higher-income households. Table 1 sorts each of Tempe's 76,218 occupied housing units into affordability categories. The six categories reflect the percentage of median family income (MFI) for the Phoenix-Mesa-Scottsdale metropolitan statistical area (MSA) that a household needs to earn to avoid being burdened by housing costs.[2] Nearly 20,000 units are designated as "affordable," meaning that households earning 80% or less of MFI would be able to handle the costs. 68% of the affordable properties are available for rent only, suggesting that prospective low-income buyers will likely find it difficult to locate suitable homes.

[2] For the purposes of constructing the affordability ranges, we relied on metro-level MFI estimates from the Department of Housing and Urban Development (HUD).

Table 1. Number of Housing Units by Affordability Range

Household Income by Percent of MFI	Tempe, AZ	85281	85282	85283	85284
	Ownership Housing Stock				
Affordable (0%-30%)	1,829	567	959	519	40
Affordable (30%-50%)	1,075	427	446	362	0
Affordable (50%-80%)	3,481	1,050	1,391	1,324	61
Workforce (80%-120%)	8,119	1,341	3,592	2,867	450
Market Rate (120%-200%)	11,896	1,635	3,834	3,865	2,637
Luxury (200% and up)	4,297	483	429	531	2,867
Total	**30,698**	**5,503**	**10,651**	**9,467**	**6,055**
	Rental Housing Stock				
Affordable (0%-30%)	1,733	873	614	464	27
Affordable (30%-50%)	2,965	2,001	612	743	85
Affordable (50%-80%)	8,638	4,367	2,797	1,588	23
Workforce (80%-120%)	26,072	10,427	8,106	6,949	678
Market Rate (120%-200%)	5,383	2,407	1,334	1,187	473
Luxury (200% and up)	729	311	317	37	65
Total	**45,520**	**20,386**	**13,780**	**10,968**	**1,351**
	Total Occupied Housing Stock				
Affordable (0%-30%)	3,562	1,440	1,573	983	67
Affordable (30%-50%)	4,040	2,428	1,057	1,105	85
Affordable (50%-80%)	12,119	5,417	4,189	2,912	864
Workforce (80%-120%)	34,191	11,768	11,698	9,816	1,128
Market Rate (120%-200%)	17,280	4,042	5,168	5,052	3,110
Luxury (200% and up)	5,027	794	746	567	2,931
Total	**76,218**	**25,889**	**24,431**	**20,435**	**7,406**

Note: *Income categories derived from HUD estimate of median family income for the Phoenix-Mesa-Scottsdale MSA. Affordability thresholds restrict a house's value to three times gross annual household income and gross rent to 30% of gross income.*

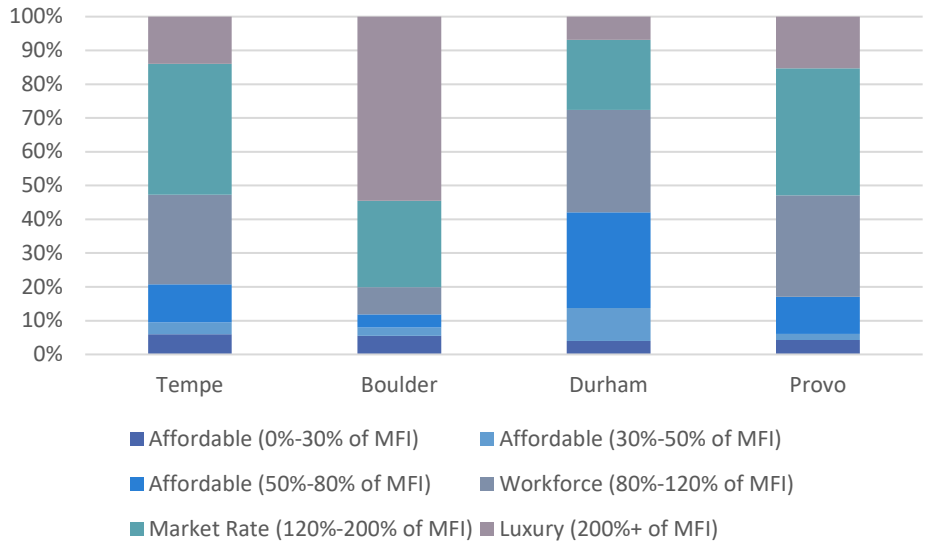
Source: *2020 ACS five-year estimates.*

How does Tempe compare to peer communities in terms of housing affordability?

To provide a wider frame of reference for evaluating the state of housing in Tempe, we compare its inventory to those of three peer communities identified by the city: Boulder, CO; Durham, NC; and Provo, UT. At least in terms of owner housing affordability, Tempe does not seem to be an outlier among college towns. The median Tempe home is worth $287,600, placing the city between Durham ($243,000) and Provo ($298,000). By a large margin, Boulder is the most expensive of the four cities, with a median home value of $736,000. The cities rank differently when it comes to rental costs. Tempe's median gross rent of $1,230 is second only to that of Boulder ($1,588). In Durham and Provo, median unit rent costs $1,098 and $901 per month, respectively.

The distributions of the housing units across the six affordability categories for the four communities are pictured in Figures 3, 4, and 5. As Figure 3 shows, the bulk of Tempe's ownership stock meets the definition of "market rate" housing, which is only affordable to households earning at least 120% of MFI, or $93,360. In terms of affordability, Provo's ownership stock is nearly identical to Tempe's. Durham has the richest supply of owner-occupied homes whose costs would not be excessive for those earning 80% or less of MFI, whereas Boulder is most suitable for those in search of luxury housing.

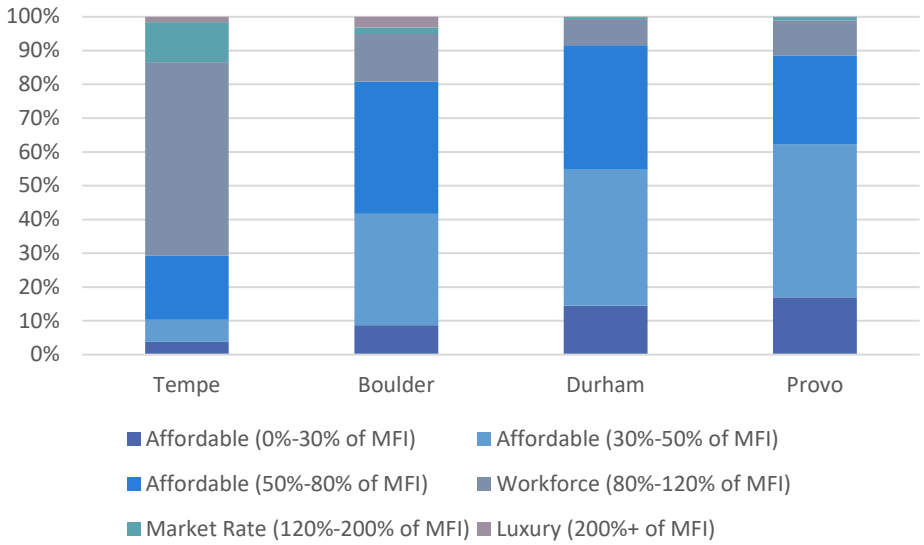
Figure 3. Percentage of Owner-occupied Housing Units in Affordability Ranges by City



Note: *Income categories derived from HUD estimates of median family income for the Phoenix-Mesa-Scottsdale MSA, the Boulder MSA, the Durham-Chapel Hill HUD Metro FMR Area, and the Provo-Orem MSA. Affordability thresholds restrict a house's value to three times gross annual household income and gross rent to 30% of gross income.*
Source: *2020 ACS five-year estimates.*

Figure 4 shows that Tempe's rental market has more options for low-income earners than its owner market. Still, the city's affordable rental inventory pales in comparison to those of Boulder, Durham, and Provo. Unlike in the other three cities, most Tempe rentals fall into the workforce category, rather than the three affordable ranges. Another distinguishing feature of Tempe's rental inventory is its relatively high share of market rate homes. In sum, Tempe's rental market is more oriented toward middle- and higher-income earners than appears to be typical for a college town.

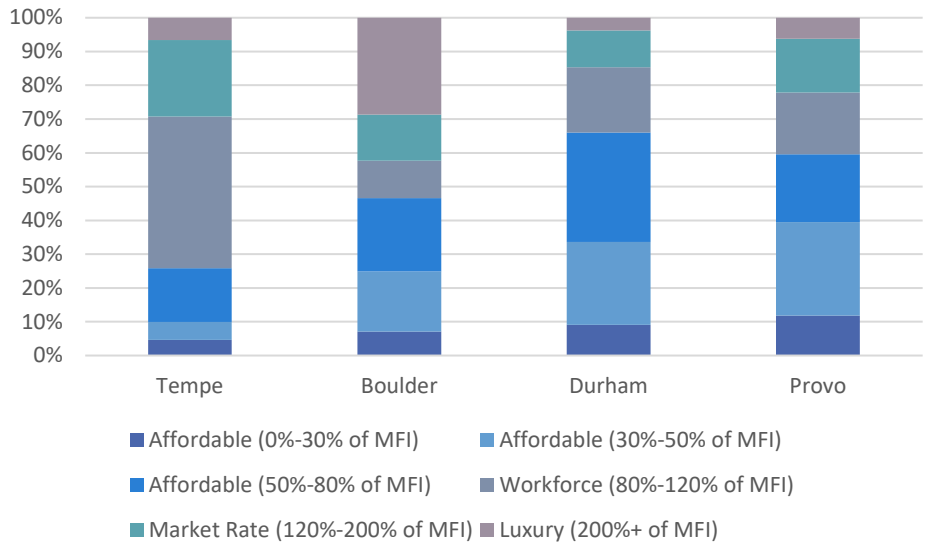
Figure 4. Percentage of Renter-occupied Housing Units in Affordability Ranges by City



Note: *Income categories derived from HUD estimates of median family income for the Phoenix-Mesa-Scottsdale MSA, the Boulder MSA, the Durham-Chapel Hill HUD Metro FMR Area, and the Provo-Orem MSA. Affordability thresholds restrict a house's value to three times gross annual household income and gross rent to 30% of gross income.*
Source: *2020 ACS five-year estimates.*

The affordability compositions of the four housing stocks in their entirety appear in Figure 5. Given that rental units dominate the Tempe market, it comes as no surprise that the city's total stock has comparatively few units priced between 0% and 80% of MFI. A plurality of its units are considered to be workforce housing. Boulder's overall market has a strong upper-class bias, especially in comparison to the others, whereas Durham's and Provo's are the most favorable to low-income residents.

Figure 5. Percentage of Total Occupied Housing Units in Affordability Ranges by City



Note: *Income categories derived from HUD estimates of median family income for the Phoenix-Mesa-Scottsdale MSA, the Boulder MSA, the Durham-Chapel Hill HUD Metro FMR Area, and the Provo-Orem MSA. Affordability thresholds restrict a house's value to three times gross annual household income and gross rent to 30% of gross income.*
Source: *2020 ACS five-year estimates.*

How difficult is it for renters to afford the median property in Tempe?

Under the general rule that monthly housing costs should constitute, at most, 30% of household income, the median renter household in Tempe falls barely short of the earnings needed to safely afford median gross rent (see Table 2). In 2020, annual median income was $939 less than the minimum income required to pay $1,230 in rent on a monthly basis. The relatively low supply of units in the 0% to 80% of MFI tier is likely the culprit of the disparity. ***Encouragingly, however, renters did face a less dire predicament in 2020 than they had five years prior, buoyed by the tendency of household income to grow at a faster rate than rent in the intervening period.***[3]

[3] While the situation has almost certainly deteriorated in the two years since 2020, rent's increasing affordability from 2015 to 2020 should inspire confidence that conditions can improve.

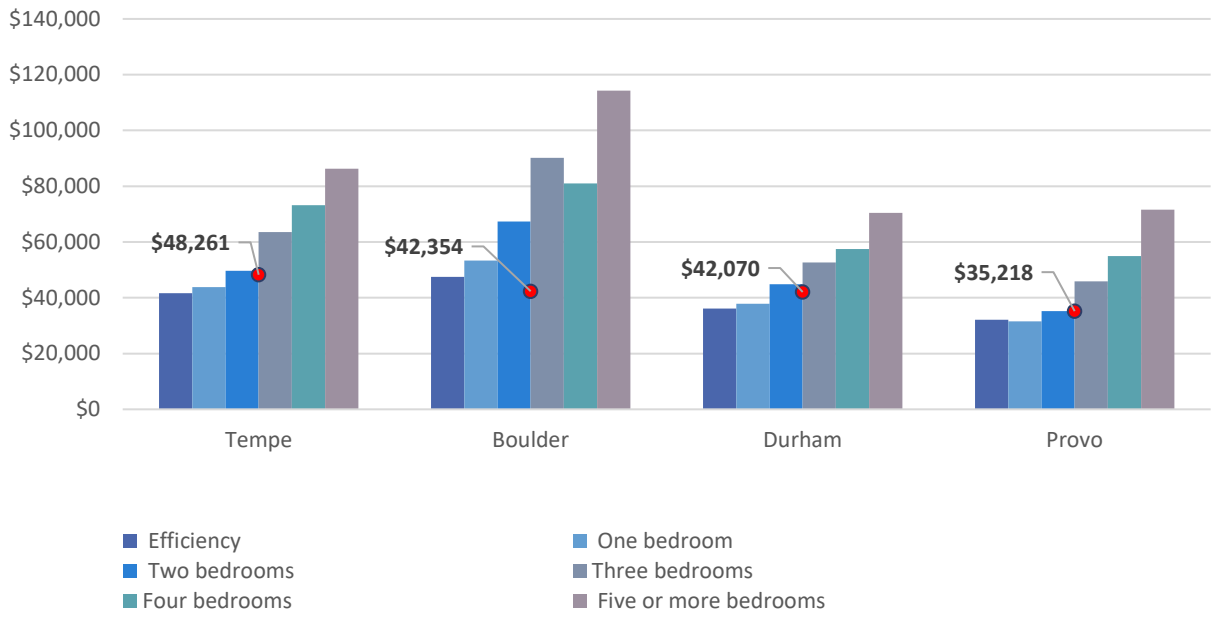
Table 2. Rental Affordability in Tempe, 2020

Year	Median Gross Rent	Household Income Required to Afford Median Gross Rent	Actual Median Renter Household Income	Actual Median Renter Household Income Relative to Required Income	Compound Annual Growth Rate of Median Rent (2015 to 2020)	Compound Annual Growth Rate of Median Renter Income (2015 to 2020)
2020	$1,230	$49,200	$48,261	98%	3.37%	3.60%

Note: *Dollar values adjusted for inflation to constant 2020 dollars.*
Sources: *2015 and 2020 five-year ACS estimates.*

Figure 6 depicts the minimum income required at the 30% benchmark to afford rental units of varying size in Tempe and peer communities. These income requirements, which are represented by the columns in the chart, were computed using separate ACS estimates of median gross rent for units with between zero and five or more bedrooms. The red points denote the city-specific ACS estimates of actual median renter household income, implying columns that extend above the red point indicate units whose costs would burden the median renter. In Tempe, only efficiency and one-bedrooms are affordable for the median renter household, and the same is true in Durham and, to a lesser extent, Provo. The median renter is in an even more desperate position in Boulder, where units of all sizes are out of reach.

Figure 6. Minimum Income Required to Afford Median Gross Rent at 30% Threshold for Varying Housing Sizes by City, 2020



Note: *Red points represent actual city-level renter household median income.*
Source: *2020 five-year ACS estimates.*

Does Tempe offer affordable housing options for residents seeking to become homeowners?

The body of evidence indicates that Tempe is affordable for both older and, albeit to a lesser extent, newer homeowners. According to the most recent ACS data, the median monthly owner housing costs in Tempe are $1,150 (see Table 3). This means that to contain housing costs to 30% or less of household income, a household needs to earn at least $46,000. In reality, owner households earn nearly twice that amount, suggesting that the typical Tempe homeowner should, under ordinary circumstances, face no issue in meeting these costs. Furthermore, as incomes trended upward between 2015 and 2020, inflation-adjusted housing costs moved in the opposite direction.

Table 3. Housing Affordability for Existing Tempe Homeowners, 2020

Year	Median Owner Costs per Month	Household Income Required to Afford Median Housing Costs	Actual Median Owner Household Income	Actual Median Owner Household Income Relative to Required Income	Compound Annual Growth Rate of Median Owner Costs (2015 to 2020)	Compound Annual Growth Rate of Median Owner Income (2015 to 2020)
2020	$1,150	$46,000	$90,543	197%	-1.27%	2.80%

Note: *Dollar values adjusted for inflation to constant 2020 dollars.*
Sources*: 2015 and 2020 five-year ACS estimates.*

As of December 2020, the median Tempe home sold for $350,000, which typically translates to a monthly mortgage payment of $1,257 (see Table 4).[4] An annual household income of $50,280 is adequate to keep these payments at or below the 30% threshold. The median family in not only Tempe but also in the greater Phoenix metro area earns significantly more than this sum, suggesting that a large majority of families in the region are capable of comfortably purchasing a home in Tempe.

[4] These calculations assume a 20% down payment, 3.5% mortgage rate, and 30-year mortgage and do not account for property taxes, insurance, and other ownership costs. Sale price data come from Redfin.

Table 4. Housing Affordability for New Tempe Homeowners, 2020

Year	Median Mortgage Payment	Household Income Required to Afford Median Housing Costs	Actual Median Family Income in Tempe	Actual Median Family Income in Tempe Relative to Required Income	Actual Median Family Income in Phoenix MSA	Actual Median Family Income in Phoenix MSA Relative to Required Income
2020	$1,257	$50,280	$79,609	158%	$77,800	155%

Note: *Dollar values adjusted for inflation to constant 2020 dollars. Mortgage payment based on a $350,000 sale price and assumes a 20% down payment, 3.5% rate, and 30-year term.*
Sources*: 2020 five-year ACS estimates; Redfin; HUD.*

What are the current rental and ownership housing gaps in Tempe?

It can be a challenge for high- and low-income households to secure appropriately priced housing in Tempe. Table 5 presents the housing gap analyses, which measure the difference between housing stock supply and the level of consumer demand, for Tempe's rental and owner markets. A red value enclosed in parentheses indicates a housing deficit, while a black value denotes a housing surplus. The results are disaggregated by affordability category, making it possible to determine the size of the housing gap at a given price range. The results indicate that there is a deficit of both owner and rental units at the 0% to 80% of MFI level. The shortage is most severe in the rental market, and it particularly affects the lowest-income households. Large surpluses exist at the workforce rate (80% to 120% of MFI) for both types of housing, indicating that low-income residents commonly resort to living in homes that stretch their budgets. At the market rate, there is a deficit of rental housing but an excess of owner housing. Luxury housing (200%+ of MFI) is, too, in short supply. In short, Tempe's current housing stock is more middle-class oriented than its population.

Table 5. Housing Gaps by Affordability Range in Tempe, 2020

Household Income by Percent of MFI	Owner-occupied Gap	Renter-occupied gap	Total gap
Affordable (0%-30%)	(714)	(9,893)	(10,607)
Affordable (30%-50%)	(1,434)	(4,110)	(5,544)
Affordable (50%- 80%)	(1,350)	(947)	(2,297)
Workforce (80%-120%)	2,253	17,098	19,351
Market Rate (120%-200%)	3,889	(1,025)	2,864
Luxury (200% and up)	(2,644)	(1,123)	(3,767)
Total	0	0	0

Note*: Income categories derived from HUD estimate of median family income for the Phoenix-Mesa-Scottsdale MSA. Affordability thresholds restrict a house's value to three times gross annual household income and gross rent to 30% of gross income. Housing deficits indicated by red values enclosed in parentheses. Housing surpluses indicated by black values.*
Source*: 2020 five-year ACS estimates.*

Introduction

In July 2022, the City of Tempe retained Matrix Design Group, Inc. to conduct an updated housing inventory and affordability analysis. Matrix last carried out such an analysis for the city in 2020. The primary purpose of the study is to help Tempe staff understand the distribution and categorization of the city's occupied housing stock as it relates to quantity and affordability. To provide additional context, the study compares Tempe's stock to those of several peer communities.

Methodology

The housing analysis utilizes the most current and readily available secondary data for housing markets in Tempe and its peer communities. Given delays in Census dissemination, 2020 represents the benchmark year. The main data sources used in the analysis include:

- 2020 American Community Survey (ACS) five-year estimates
- Redfin
- US Department of Housing and Urban Development (HUD) Median Family Income Documentation System
- CoStar

Like the previous iteration of the analysis, this study utilizes a metholodgy that allows for a standardized comparison from year to year. This methodology, developed by the Metropolitan Center at the Florida International University, uses ACS data from the U.S. Census. The ACS benefits from employing consistent data collection techniques, which greatly reduce analytical and statistical error. We opted to use five-year ACS estimates because they offer important advantages over the alternatives. In addition to having smaller margins of error, five-year estimates allow for the analysis of regions with populations of less than 65,000. An unavoidable limitation of our approach, though, is that because the most recent ACS estimates are from 2020, the results do not reflect the arguably seismic changes that have occurred in the housing market since then. CoStar multifamily rental housing data and Redfin home sale price data extend through 2022, but they are of limited utility because contemporaneous demographic data do not yet exist.

Central to the analysis are comparisons to Tempe's zip codes, a one-mile buffer around the city, and similar (peer) cities.The one-mile buffer comparison can be found in the appendix, along with several supplementary analyses. The specific comparison geographies examined are listed below.

- Boulder, CO
- Durham, NC
- Provo, UT
- Zip 85281
- Zip 85282
- Zip 85283
- Zip 85284
- One-mile buffer around Tempe

Gap analyses displaying the difference between supply and demand by affordability range appear throughout the study. As is customary in the research literature, we constructed these ranges based on Department of Housing and Urban Development (HUD) estimates of median family income (MFI), otherwise known as area median income. An important distinction between HUD and ACS estimates of median income utilized in this study is that the former are always at the level of the metropolitan area, not the city. The HUD estimate of MFI for Tempe, for example, covers the entire Phoenix-Mesa-Scottsdale metropolitan statistical area (MSA). Metro-level MFI serves to contextualize a housing market's state within a broader region and thus is more suitable for evaluating overall affordability. Table 6 provides HUD MFI estimates for the metropolitan areas associated with Tempe, Boulder, Durham, and Provo. Of the four cities, Tempe is situated in the metro area with the lowest MFI, at $77,800. Families residing in the Provo-Orem area enjoy a marginally higher median income of $80,400. In the markets that include Durham and Boulder, the typical family household fares even better, earning $90,900 and $115,100, respectively.

In the ensuing analyses, homes are grouped into one of six affordability categories. Homes in the first three categories are considered "affordable," meaning that ownership or rental costs should not burden households whose incomes fall between 0% to 30%, 30% to 50%, and 50% to 80% of MFI, respectively. The next classification, "workforce" housing, includes units deemed appropriate for those earning between 80% and 120% of MFI. In Tempe, a workforce home is affordable for a household earning between $62,240 and $93,360. "Market rate" units are suitable for buyers with incomes ranging from 120% to 200% of MFI. The most expensive category, "luxury" housing, comprises the units considered affordable for those earning at least 200% of MFI (or, in the case of Tempe, $155,600). The minimum household income required to comfortably buy or rent a home in each city by affordability range appears in Table 6.

Table 6. Median Family Income Estimates and Lower Limits of Affordability Ranges, 2020

Income Range	Tempe, AZ	Boulder, CO	Durham, NC	Provo, UT
	MFI = $77,800	MFI = $115,100	MFI = $90,900	MFI= $80,400
	Lower Income Limit	Lower Income Limit	Lower Income Limit	Lower Income Limit
Affordable (0-30%)	$0	$0	$0	$0
Affordable (30%-50%)	$23,340	$34,530	$27,270	$24,120
Affordable (50%-80%)	$38,900	$57,550	$45,450	$40,200
Workforce (80%-120%)	$62,240	$92,080	$72,720	$64,320
Market Rate (120%-200%)	$93,360	$138,120	$109,080	$96,480
Luxury (200% and up)	$155,600	$230,200	$181,800	$160,800

Note: *HUD MFI estimates are at the metro level and therefore differ from the city-specific MFI estimates produced by the ACS.*
Source: *HUD FY 2020 Median Family Income Documentation System.*

Demographic Analysis

As a preliminary step in our analysis, we investigated the demographics of Tempe and its comparative regions. This demographic overview consists of over-time and cross-community examinations of total population size, population by age, housing tenure, income, and family household status.

Population

Table 7 presents population estimates obtained from authoritative state government sources for Tempe and its neighboring communities, as well as Maricopa County, at 10-year intervals from 2000 through 2020. Notably, Tempe accounts for a small share of Maricopa's total population: As of 2020, 4% of the county's residents resided in the city. During the first two decades of the century, Tempe's population rose by nearly 23,000 residents, from 158,671 to 181,580, with 85% of the increase occurring after 2010. The rapid population growth of the 2010s represented a remarkable turnaround for a city that had struggled to compete with its neighbors in the prior decade. It was also consistent with broader trends in Maricopa County, which added about 612,000 residents—equivalent to a 16% increase—over the same period. Significantly, although Tempe continued to fall short of the county-wide pace, its growth rate of 12% eclipsed those of Phoenix, Scottsdale, and Glendale.

Table 7. Population Growth in Tempe and Surrounding Communities, 2000 to 2020

Region	Total Population			Aggregate Percent Change	
	2000	2010	2020	2010	2020
Tempe	**158,671**	**162,010**	**181,580**	**2%**	**12%**
Maricopa County	**3,092,927**	**3,824,083**	**4,436,704**	**24%**	**16%**
Avondale	36,400	76,418	89,480	110%	17%
Buckeye	6,697	51,377	93,629	667%	82%
Chandler	178,398	236,678	277,116	33%	17%
Gilbert	111,250	209,458	268,728	88%	28%
Glendale	219,392	226,866	248,686	3%	10%
Goodyear	19,700	65,566	96,789	233%	48%
Mesa	400,491	439,875	505,447	10%	15%
Phoenix	1,324,016	1,448,683	1,611,162	9%	11%
Scottsdale	204,060	217,285	241,718	6%	11%
Surprise	32,667	117,720	144,246	260%	23%

Sources: *Arizona Department of Economic Security's Population Statistics Unit, Arizona Department of Commerce's Office of Employment and Population Statistics, and Arizona Office of Economic Opportunity.*

Population by Age

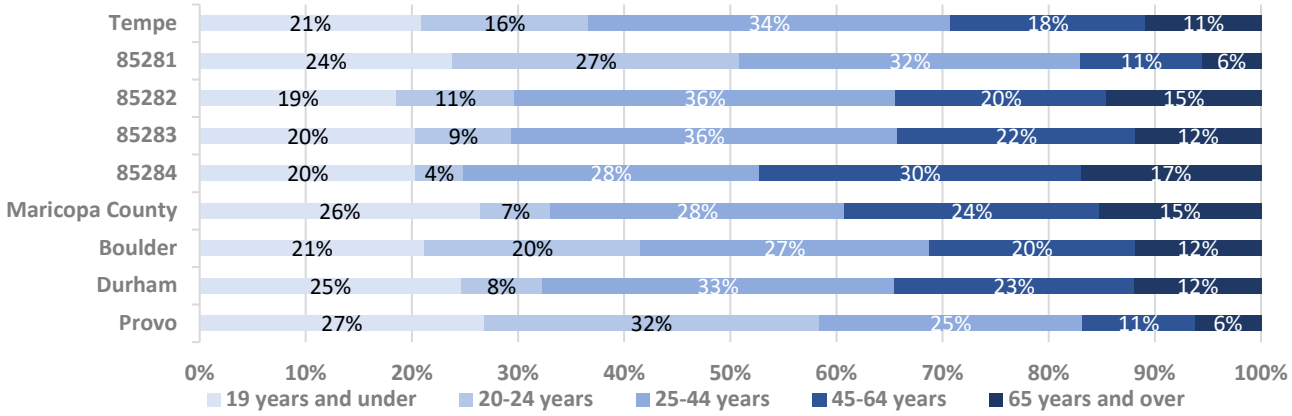
Age breakdowns of Tempe's population appear in Table 8 and Figure 7. Despite the considerable variance in age demographics across its zip codes, Tempe's population is relatively young—a result, in part, of the presence of Arizona State's main campus. Since 2010, people under the age of 25 have composed no less than 37% of the city's population, exceeding the U.S. national average, and those between the ages of 25 and 44 have consistently constituted a plurality of residents. Moreover, the latter group's share of the population has only grown with the passage of time, suggesting that the in-migration of young professionals has driven much of the city's population growth. Compared to other communities in Arizona, Tempe appears to be a less appealing retirement spot. Indeed, while the presence of individuals over the age of 65 has increased modestly in recent years, their share of the population in 2020 was seven percentage points lower than the statewide figure of 18%.

Table 8. Age Composition of Tempe Population, 2010 to 2020

Age Cohort	2010		2015		2020	
	Number	Percent	Number	Percent	Number	Percent
Under 19 years	44,314	27%	43,215	25%	39,981	21%
20-24 years	25,211	16%	30,264	17%	30,252	16%
25-44 years	49,210	30%	51,444	29%	65,273	34%
45-64 years	27,413	17%	34,185	19%	35,329	18%
65 years and over	15,975	10%	16,718	10%	20,772	11%

***Sources**: 2010, 2015, and 2020 five-year ACS estimates.*

Figure 7. Age Composition of Population by Region, 2020



***Source:** 2020 five-year ACS estimates.*

Household Income

An analysis of household income data can provide critical insight into the capacity of Tempe residents to afford various housing options. Table 9 reveals that the median Tempe household earned $61,290 in 2020—an increase of nearly $8,000 from 2015 and about $4,000 less than the national average. The dramatic rise in income over this period is in accordance with expectations: By 2016, when the Census Bureau began its data collection efforts for the 2020 ACS, wages were on the upswing as the U.S. was in the midst of its longest economic expansion on record. By contrast, household income had dropped in the preceding five years due to the Great Recession's lingering effects on the labor market during the early 2010s. Data disaggregated by housing tenure reveal that the decline was unique to owner households. A possible explanation for this phenomenon is that higher-income earners generally experience larger reductions in pay upon losing their jobs and enrolling in unemployment insurance.

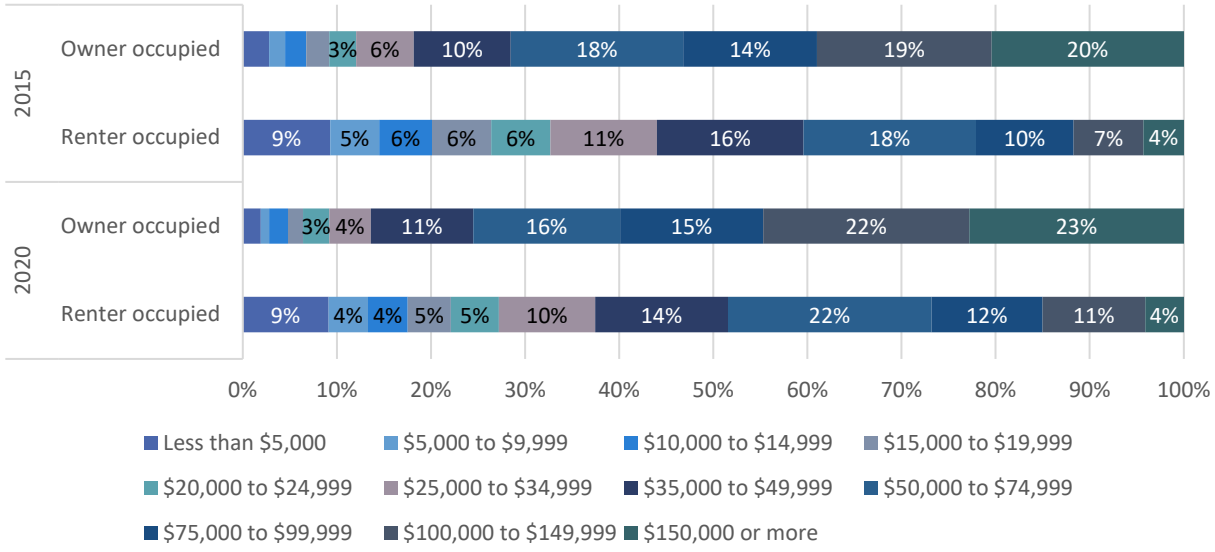
In line with conventional wisdom and patterns elsewhere, owner households earn more than renter households in Tempe (see Table 9). The disparity was at its peak in 2010, when the median income of owner-occupied households was more than twice that of renter-occupied households. The income distributions in Tempe for 2015 and 2020, which appear in Figure 8, further highlight the earnings gap between owner- and renter-occupied households. Income growth over the course of this five-year period was not limited to the former households, however; in fact, renters enjoyed a larger relative pay raise.

Table 9. Median Household Income by Tenure in Tempe, 2010 to 2020

Year	All Households		Owner-occupied Households		Renter-occupied Households	
	Median Income	Percent Change	Median Income	Percent Change	Median Income	Percent Change
2010	$56,310	-	$87,903	-	$40,156	-
2015	$53,519	5%	$78,879	-10%	$40,434	1%
2020	$61,290	15%	$90,543	15%	$48,261	19%
Difference 2010 to 2020	**$4,980**	**9%**	**$2,640**	**3%**	**$8,105**	**20%**

Note: *Dollar values adjusted for inflation to constant 2020 dollars.*
Sources*: 2010, 2015, and 2020 five-year ACS estimates.*

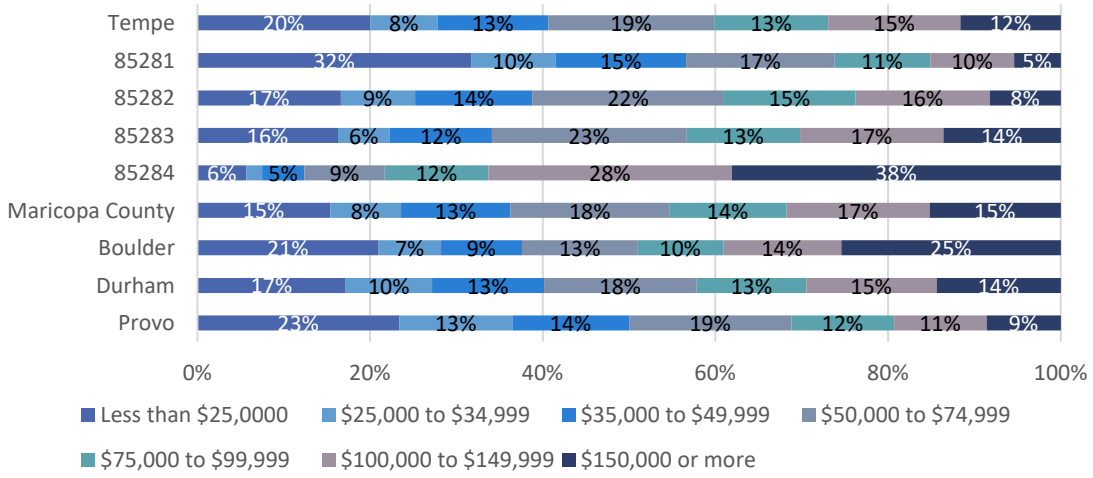
Figure 8. Household Income Distributions by Tenure in Tempe, 2015 to 2020



Note: *Dollar values adjusted for inflation to constant 2020 dollars.*
Sources*: 2015 and 2020 5-year ACS estimates.*

Tempe, Durham, and Provo share somewhat similar income distributions (see Figure 9). In each of the three cities, between 44% and 45% of households have incomes ranging from $35,000 to $99,999. Boulder's distribution is distinct from the others in that it features more high-income households and fewer middle-income households. Within Tempe, zip code 85281 has the highest percentage of households in the lowest income bracket due to the high concentration of students in its neighborhoods.

Figure 9. Household Income Distributions by Region, 2020

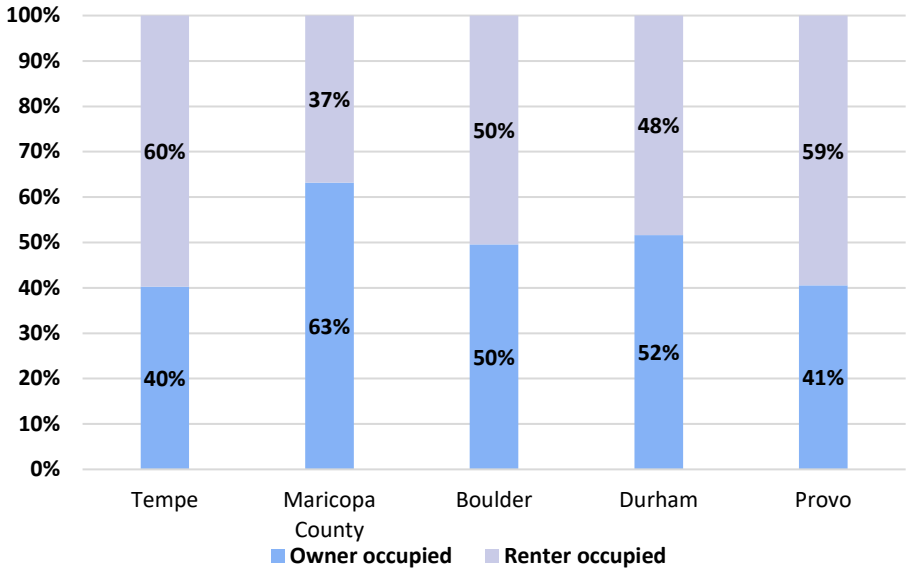


Sources*: 2015 and 2020 five-year ACS estimates.*

Housing Tenure

Do Tempe residents tend to be owners or renters? Further, how do their housing tenure decisions compare to those of residents in the broader county and peer communities? Figure 10 sheds light on these questions by displaying housing tenure composition estimates. As the plot reveals, a healthy majority—60%—of Tempe households choose to rent rather than buy. This rate is far higher than the averages for Boulder, Durham, and the remainder of Maricopa County, but nearly mirrors that for Provo. The substantial under-45 populations of Tempe and Provo are likely responsible for their comparatively high rental rates. While young people have long been more likely to rent, this has become especially true in recent years, as rising housing costs and labor market uncertainties have made homeownership increasingly inaccessible, leading researchers to label today's youth as "Generation Rent."

Figure 10. Tenure Composition of Occupied Housing Stock by Region, 2020

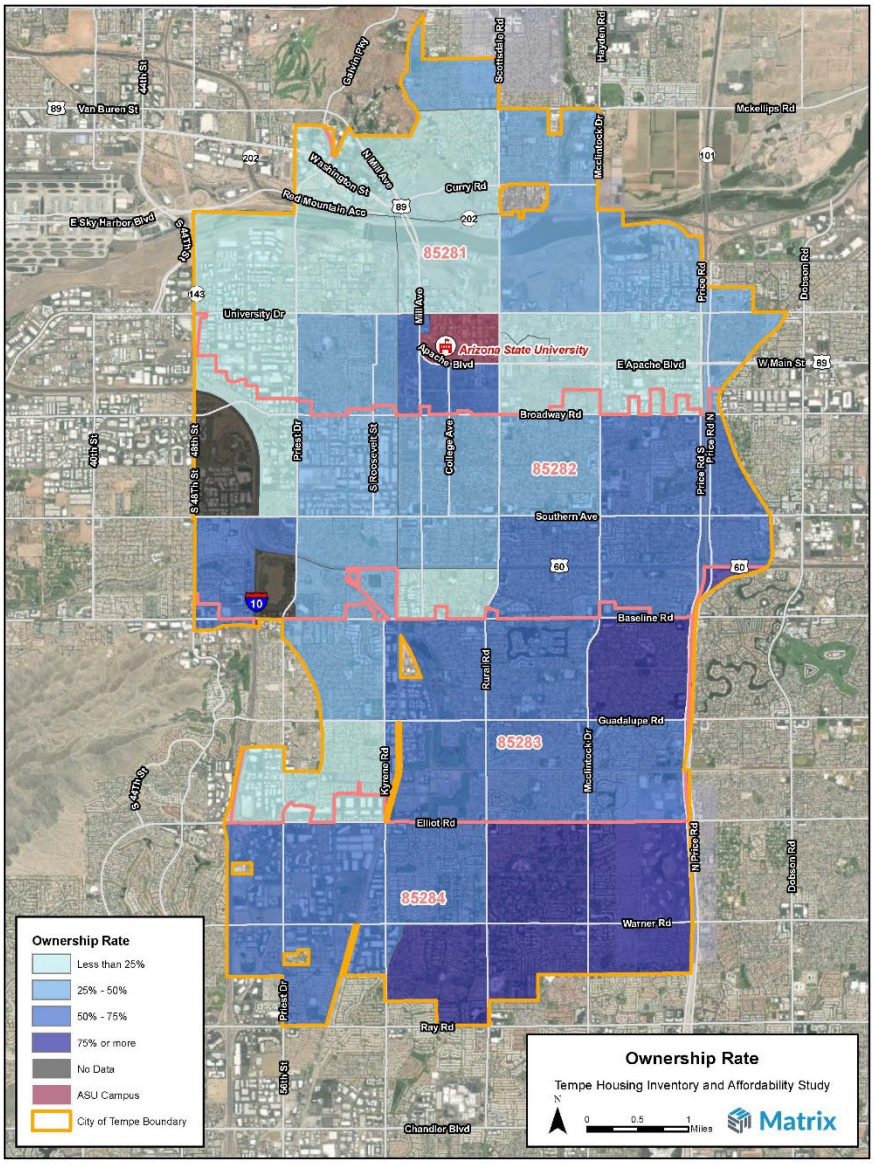


***Source**: 2020 five-year ACS estimates.*

Home Ownership Rates

Consistent with the wide variance in income and wealth across the four zip codes, the homeownership rate is not uniform throughout the city. Figure 11 is a heat map that displays the ownership rate by Census tract, where darker colors indicate higher rates of ownership. As expected, the lowest rates of home ownership exist around Arizona State. In much of this area, fewer than a quarter of the properties are owner-occupied. Generally speaking, the further south the neighborhood, the higher the homeownership rate tends to be. In the neighborhoods south of Baseline Road, for example, it is common for the ownership rate to eclipse 75%.

Figure 11. Home Ownership Rate by Census Tract in Tempe, 2020



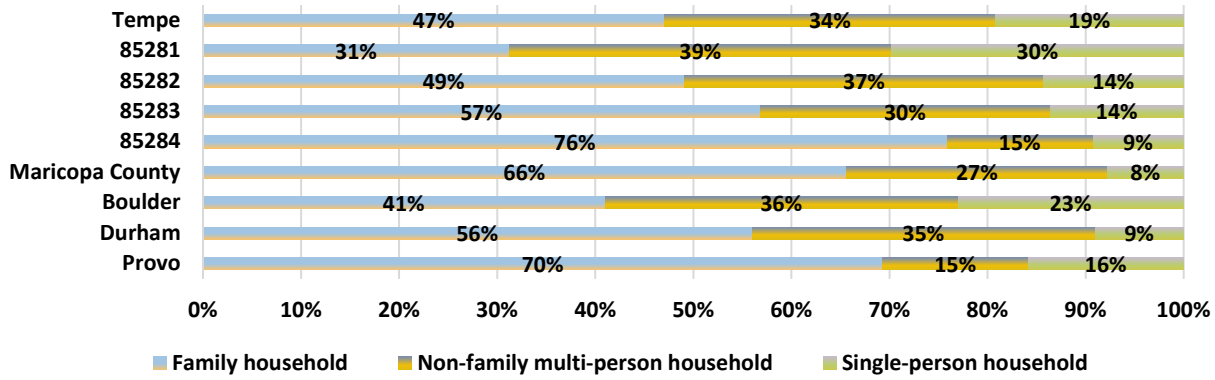
Source: *2020 five-year ACS estimates.*

Family Household Status

The prevalence of young renters in Tempe means that traditional family households—that is, units consisting of at least two individuals who are related by birth, marriage, or adoption—are a minority (47%) of all households (see Figure 12). In the broader county, family households are far more

common, representing two-thirds of all households. As expected, the zip code where Arizona State is based (85281) has the lowest percentage of family households, at 31%. The share of family households in Tempe falls in between the rates for Boulder (41%) and Durham (56%). The tendency of Mormons to marry at a young age results in Provo having a higher percentage of family households (70%) than the other three cities.

Figure 12. Family Status Composition of Occupied Households by Region, 2020



Note: *Percentages for Provo do not sum to 100% due to rounding.*
Sources: *2010, 2015, and 2020 five-year ACS estimates.*

General Housing Stock Appraisal

The remainder of the study focuses on Tempe's housing inventory. Below, we explore vacancies, structural diversity, and housing stock age, before separately assessing the states of the ownership and rental markets.

Vacancy Rate

A key indicator of the state of a housing market is the vacancy rate. Naturally, this variable is a product of supply and demand. That is, a high vacancy rate suggests that current properties are too expensive for prospective buyers or renters, while a low vacancy rate is indicative of a healthy market in which prices are at, or near, equilibrium. In general, metropolitan areas should aim for a vacancy rate of between two and four percent. An additional, related reason the vacancy rate is informative is that it can help predict the future direction of a housing market. In an area with a plethora of empty homes, prices are unlikely to face the same upward pressures that they would in the presence of intense market competition.

Table 10 displays the vacancy rates for Tempe and the other regions under study. Of the 83,039 total units in Tempe, 8% were unoccupied in 2020. While Boulder, Durham, and Provo all boasted lower vacancy rates, it is noteworthy that Tempe's vacancy rate declined by 3 percentage points between 2015 and 2020. Within Maricopa County, high vacancy rates are not unique to Tempe. In fact, as of 2020, one-in-ten of the county's properties lacked an inhabitant.

Table 10. Housing Vacancy Rates by Region, 2020

Region	2015		2020	
	Total Units	Vacancy Rate	Total Units	Vacancy Rate
Tempe, AZ	**72,882**	**11%**	**83,039**	**8%**
Maricopa County	**1,668,555**	**14%**	**1,765,880**	**10%**
Boulder, CO	44,578	5%	46,333	6%
Durham, NC	109,084	8%	122,422	7%
Provo, UT	34,332	5%	35,488	6%

Source: *2020 five-year ACS estimates.*

Status of vacant rental properties warrants further investigation into Tempe's unoccupied housing units, given the city's high vacancy rate. Table 11 breaks down the status of the city's nearly 7,000 empty properties. The data indicate that 42% of them are on the market, compared to between 39% and 45% for Boulder, Durham, and Provo. Of those units, properties available to rent in Tempe outnumber those that can only be purchased by a five-to-one ratio. The relative number of rental properties without a tenant is highly similar in Boulder and Provo. Unlike the rest of Maricopa

County, properties available for seasonal use are not the most significant contributor to Tempe's vacancy rate. Rather, a plurality (37%) of unoccupied Tempe units are vacant for miscellaneous reasons.

Table 11. Vacancy Status of Vacant Rental Properties by Region, 2020

Vacancy Status	Tempe	Maricopa County	Boulder	Durham	Provo
Total Vacancies	6,821	169,096	2,955	8,002	2,041
For rent	35%	18%	32%	42%	33%
Rented, unoccupied	6%	5%	19%	7%	11%
For sale only	7%	9%	7%	3%	7%
Sold, not occupied	5%	6%	1%	3%	5%
For seasonal use	10%	42%	21%	6%	15%
For migrant workers	0%	0%	0%	0%	0%
Other vacant	37%	21%	19%	39%	28%

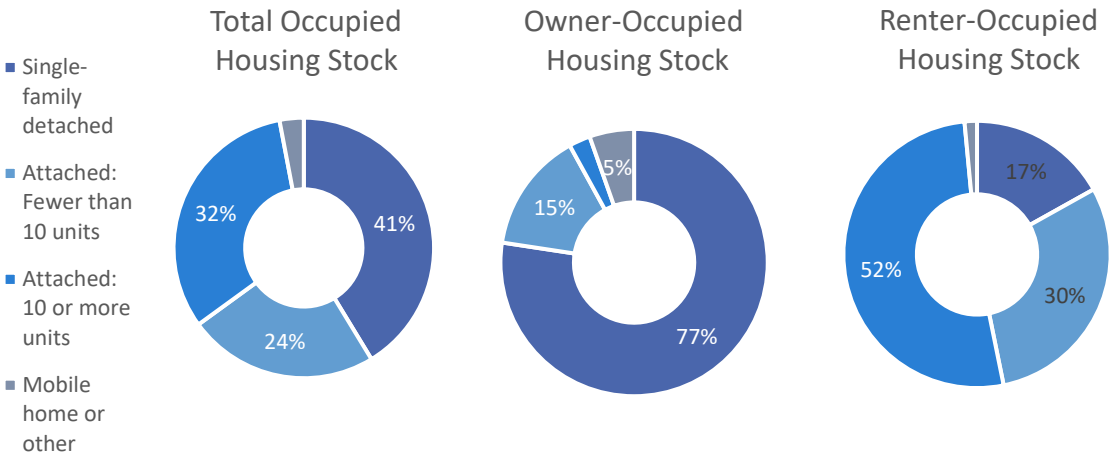
Source: *2020 five-year ACS estimates.*

Structural Diversity

To be affordable to residents of varying socioeconomic status, it is imperative that a community offers potential buyers and renters a diversity of structural options. More specifically, the presence of adequate multifamily attached homes, which tend to be less cost prohibitive, can help alleviate housing insecurity. Only 41% of Tempe properties are single-family detached homes (see Figure 13)—a significant difference from the county-wide average of 64%. Attached homes—including apartments, condominiums, and townhouses—represent virtually all the remaining units, while mobile homes and other housing are 3% of the total inventory. Of course, tenure shares a strong relationship with whether a unit is attached or detached. Owner-occupied units are overwhelmingly single-family detached homes, whereas attached homes are concentrated in the renter-occupied stock.

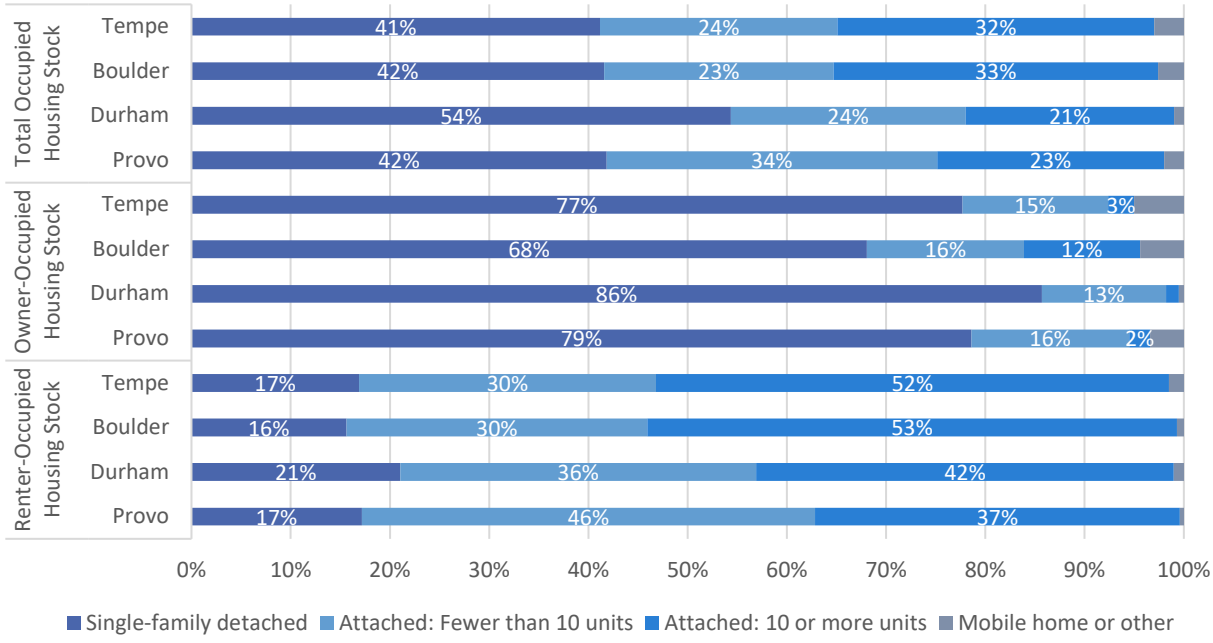
Figure 14 compares structural diversity by tenure across the communities of interest. Tempe's inventory is almost identical to Boulder's and comparable to Provo's. Single-family detached homes are about equally common in each of the three cities, including among their renter-occupied stocks. Durham stands apart as the only community in which single-family detached homes constitute most of the overall housing stock. Even Durham's renter-occupied inventory contains a higher percentage of single-family detached homes than those of Tempe, Boulder, and Provo. Taken together, the data suggest that Tempe has adapted to the needs of its young, student-oriented population, offering a relatively heterogeneous array of structural options in a county where single-family detached homes are the norm.

Figure 13. Structural Diversity of Occupied Housing Stock by Tenure in Tempe, 2020



Source: *2020 five-year ACS estimates.*

Figure 14. Structural Diversity of Occupied Housing Stock by Tenure and City, 2020

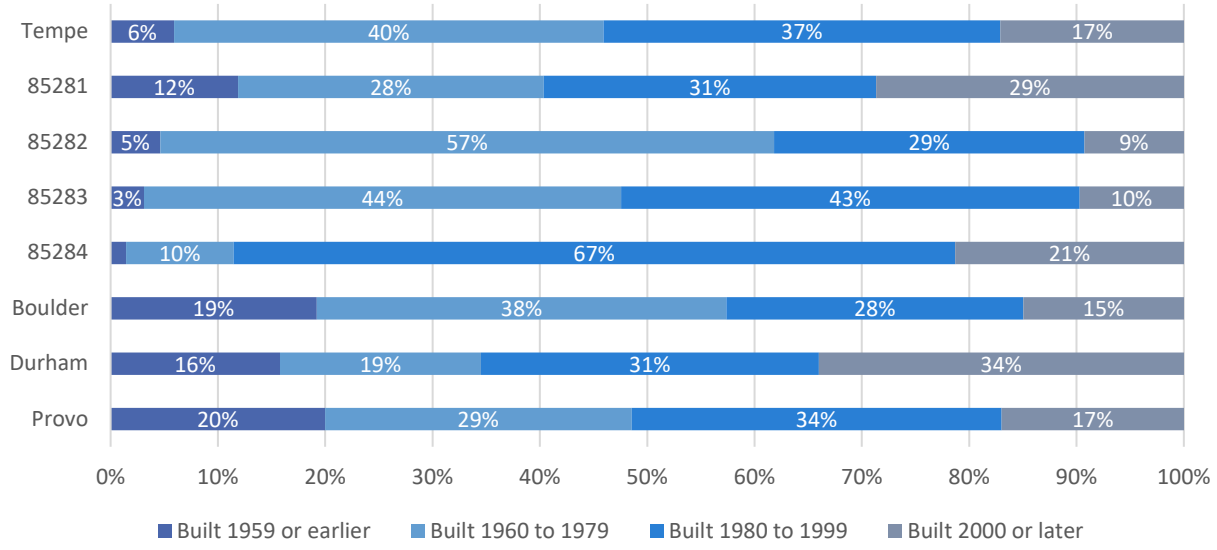


Source: *2020 five-year ACS estimates.*

Age of Housing Stock

The age of a housing stock is another proxy for its overall state. As Figure 15 shows, a mere 6% of Tempe's units were built before 1960—the lowest percentage of the cities under examination. Within Maricopa County, Tempe is by no means an outlier, as a similar share of the county's overall housing stock falls into this category. That Arizona did not earn statehood until 1912, then, likely accounts for the dearth of very old homes in Tempe's inventory. 77% of Tempe's units were built in the last four decades of the twentieth century. Since the beginning of the twenty-first century, Tempe has matched or exceeded Boulder and Provo, but trailed Durham, in breaking ground on new homes.

Figure 15. Age Distribution of Housing Stock by Region, 2020



Source: *2020 five-year ACS estimates.*

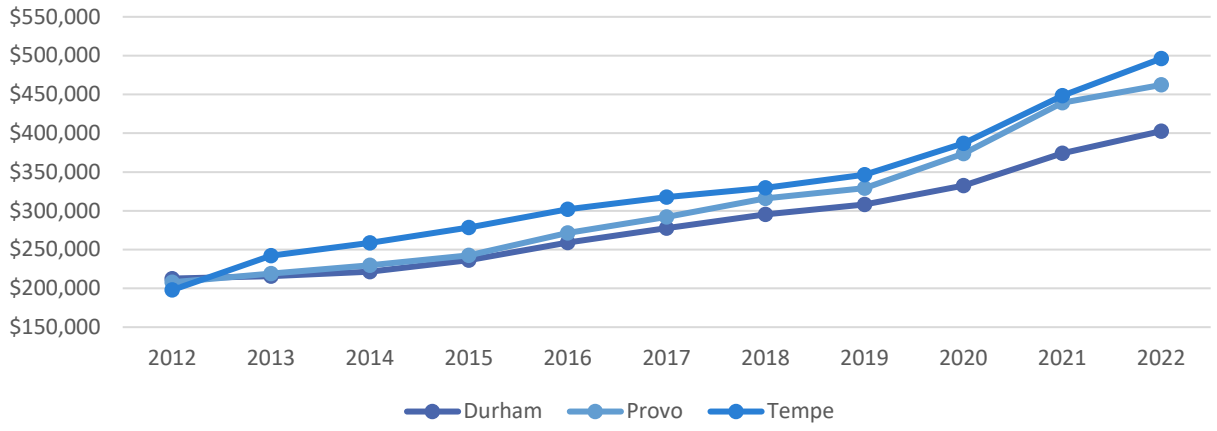
Homeownership Market Assessment

This section provides a comprehensive evaluation of Tempe's homeownership market. It covers trends in home sale price, median home value, and ownership affordability and contains an analysis of supply and demand at various affordability levels. Where appropriate, we include comparisons to other regions.

Home Sale Trends

Figure 16 displays trends in inflation-adjusted median sale price over the past decade in Tempe, Durham, and Provo. Because its inclusion would have reduced the interpretability of the data for the other three cities, the time series for Boulder, which has exorbitant housing prices, is not presented in the plot. Between 2012 and 2022, the median sale price in Tempe grew by 151%, from $197,870 to $496,186. To be sure, homes in Durham and Provo have undergone marked price increases over this period as well, but not to the same degree. Moreover, the typical Tempe home has usually been more expensive than its Durham and Provo counterparts. Prices have soared at an unprecedented rate, at least in recent memory, during the COVID-19 pandemic, as supply has failed to match demand, not only in Tempe but in the U.S. as a whole. As a case in point, Tempe's median home sale price increased by 43% from 2019 to 2022.

Figure 16. Median Home Sale Price by City, 2012 to 2022



Note: *Boulder is excluded because it is an outlier. Values are average median monthly sale prices for the year, which were adjusted for inflation to constant 2022 dollars.*
Source: *Redfin.*

Median Home Value

Table 12 provides estimates of the median Tempe and Maricopa County home values for 2010, 2015, and 2020. To clarify, in contrast to Figure 15, the figures presented here are educated "guesses" as to what the median house would sell for, rather than actual prices. The data indicate that, even as housing prices steadily rose, the median owner-occupied Tempe unit lost about

$73,000 in value between 2010 and 2015, before recovering to nearly its previous level, at a compound annual growth rate of 5.4%, by 2020. The rest of the county underwent a similar trajectory.

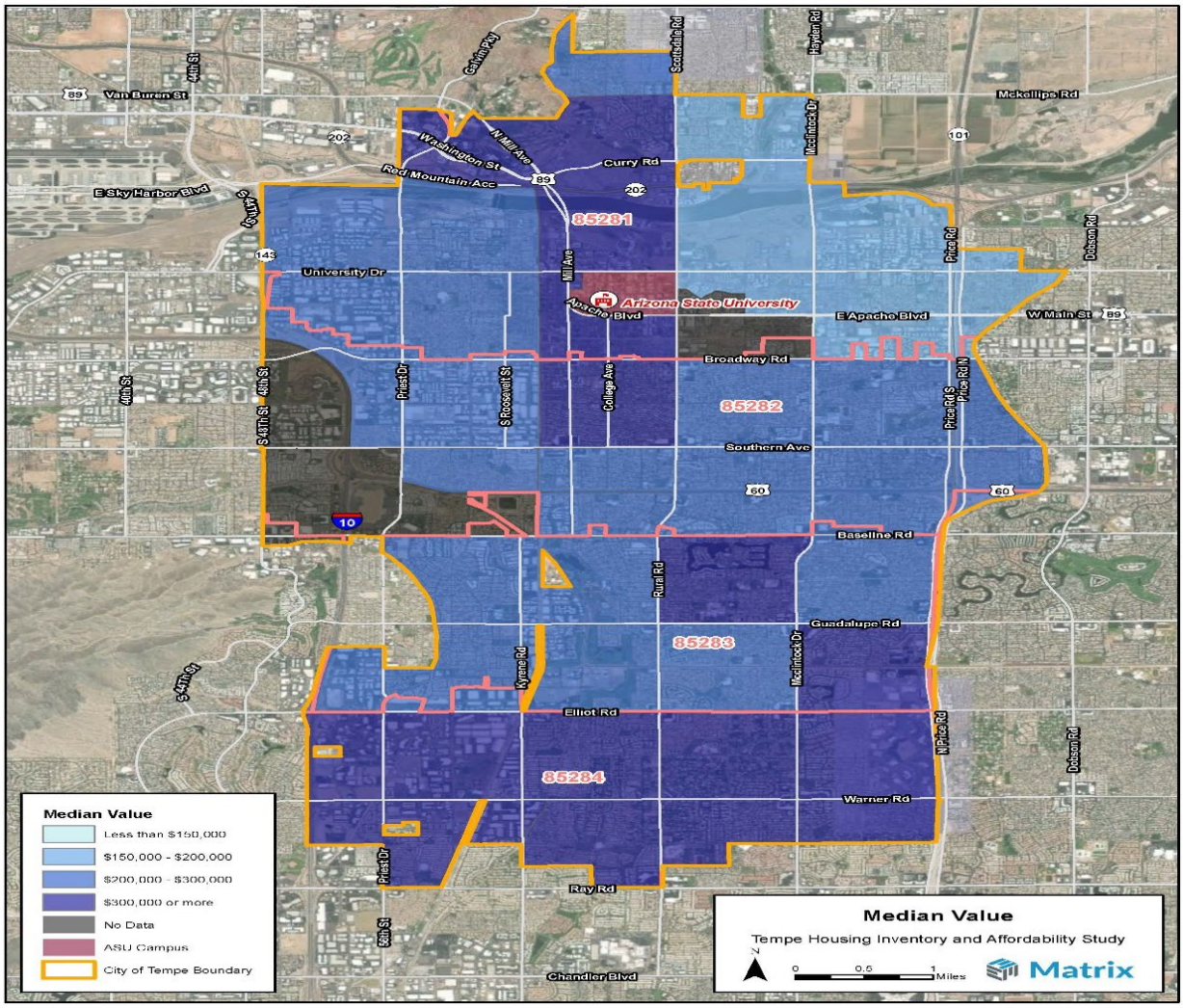
Table 12. Median Home Value of All Owner-Occupied Units in Tempe and Maricopa County, 2010 to 2020

Year	Tempe		Maricopa County	
	Median Value	Compound Annual Growth Rate	Median Value	Annual Growth Rate
2010	$294,945	-	$283,195	-
2015	$221,666	-5.6%	$204,304	-6.3%
2020	$287,600	5.4%	$278,700	6.4%
Total change 2010 to 2020	**-$7,345**	**-0.35%**	**-$4,495**	**-0.2%**

Note: *Dollar values adjusted for inflation to constant 2020 dollars.*
Sources*: 2010, 2015, and 2020 five-year ACS estimates.*

The heat map in Figure 17 categorizes each of Tempe's Census tracts based on median home value. Somewhat surprisingly, some of the city's most expensive homes are located in the vicinity of Arizona State, as indicated by the dark regions to the university's north and south. At the same time, however, the median home in the area to the university's immediate northeast is only worth between $150,000 and $200,000, making those neighborhoods the least cost-prohibitive in the entire city. In the central and western portions of the city, homes are more moderately priced. In virtually the entirety of zip code 85284, the median home is valued at $300,000 or more, rivaling—if not surpassing—the estimate for the most expensive communities surrounding Arizona State.

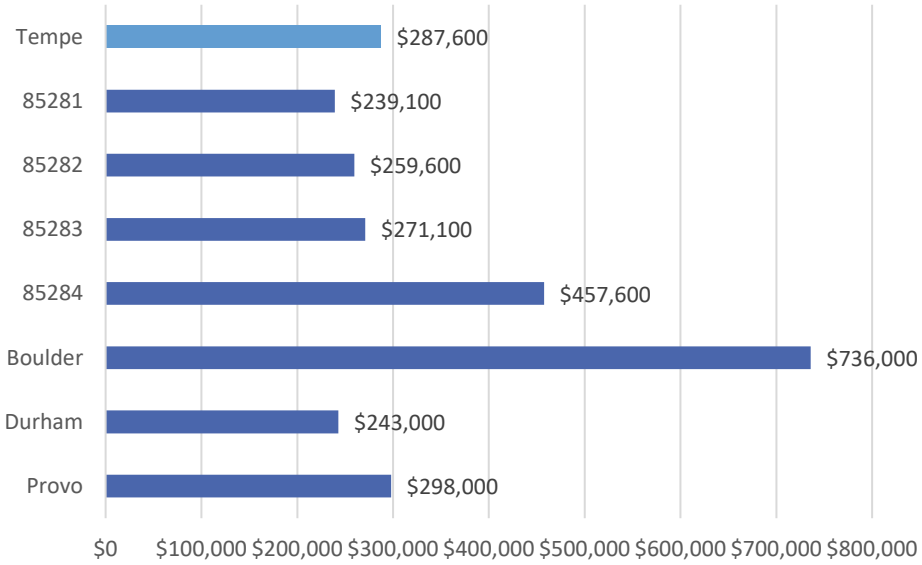
Figure 17. Median Home Value by Census Tract in Tempe, 2020



Source: *2020 five-year ACS estimates.*

Is Tempe's housing stock any more or less valuable than those of its peer communities? The answer to this question lies in Figure 18. The typical Tempe home, valued at $287,600, is worth considerably more than its Durham counterpart. Boulder and Provo homes tend to be more valuable than Tempe homes, albeit to widely varying degrees. The median Provo home is priced at $298,000, compared to $736,000 for the Boulder equivalent. Of the four Tempe zip codes, 85284 is unquestionably the wealthiest, as evidenced by its median home value of $457,600.

Figure 18. Median Home Value by Region, 2020



***Source**: 2020 five-year ACS estimates.*

Housing costs do not appear to be a severe strain on the wallets of Tempe homeowners. Recall that, as a general rule, the affordability threshold for housing—that is, the highest percentage of one's income that should be devoted to rent—is 30%. According to Table 13, the median Tempe owner spends a substantially smaller percentage of his or her income on housing. As of 2020, monthly housing costs were $1,150, meaning that, over the course of the entire year, one would need to earn $46,000 in order to stay within the affordability threshold. In actuality, the median household earned nearly twice that amount. In 2010 and 2015, the median Tempe owner did not enjoy the same level of security but was, nonetheless, squarely inside the affordability threshold. By the decade's end, a rise in incomes had coincided with a lowering of costs. Even for a household earning the Phoenix MSA median income (see Table 14), which is lower than the Tempe equivalent, Tempe owner costs are quite tolerable.

Table 13. Ownership Affordability Trends in Tempe, 2010 to 2020

Year	Median Owner Costs per Month	Household Income Required to Afford Median Housing Cost	Actual Median Owner Household Income	Actual Median Owner Household Income Relative to Required Income
2010	$1,479	$59,160	$87,903	149%
2015	$1,226	$49,040	$78,879	161%
2020	$1,150	$46,000	$90,543	197%

Note: *Dollar values adjusted for inflation to constant 2020 dollars.*
Sources*: 2010, 2015, and 2020 five-year ACS estimates.*

Table 14. Ownership Affordability Trends in Tempe for Households Earning Median Phoenix MSA Income, 2010 to 2020

Year	Median Owner Costs per Month	Household Income Required to Afford Median Housing Cost	Actual Median Owner Household Income	Actual Median Owner Household Income Relative to Required Income
2010	$1,479	$59,160	$79,880	135%
2015	$1,226	$49,040	$73,817	151%
2020	$1,150	$46,000	$82,474	179%

Note: *Dollar values adjusted for inflation to constant 2020 dollars.*
Sources*: 2010, 2015, and 2020 five-year ACS estimates.*

Although informative, the results presented above suffer from the limitation that they pertain to current, rather than new or prospective, homeowners. Table 15 provides perspective on the level of affordability for a new buyer in 2020. Assuming a 3.5% mortgage rate and 20% down payment, the monthly mortgage payment for a $350,000 home over a 30-year term would be $1,257. Although this figure is slightly higher than what existing owners were paying at the time, it was still well within the affordability range for new buyers, including those moving into the city from the broader Phoenix Metro Area. Indeed, a household earning over about $50,000 would have been able to keep housing costs to 30% or less of its income. Although these numbers do not factor in other ownerships costs, including property taxes and insurance, the sizeable margin by which the actual median income exceeded the minimum income requirement suggests Tempe families would encounter little difficulty in covering them.

Table 15. Housing Affordability for Home Purchase in Tempe, 2020

Category	Value
Mortgage Rate	3.5%
Median Sale Price (December 2020)	$350,000
Loan-to-Value	80%
Monthly Mortgage Payment (30-year term)	$1,257
Required Annual Income to Afford Tempe Median Home Sale Price	$50,280
Median Family Income - Phoenix Metro Area	$77,800
Affordability for Median Family Earning Phoenix Metro Area MFI	155%
Median Family Income – Tempe	$79,609
Affordability for Median Family Earning Tempe MFI	158%

***Sources**: 2020 five-year ACS estimates; Redfin; HUD.*

Ownership Housing Value Distribution by Affordability Range

The breakdown of Tempe's ownership housing stock across the affordability ranges is depicted in Table 16. To be classified as affordable for a given income tier, a home's value must not exceed three times the tier's upper limit. This is in keeping with the general rule that a household's gross annual income should amount to at least one-third of a home's sale price. Each of the 8,119 workforce units, for instance, are worth between $186,722 and $280,083. Overall, the ownership market caters to the MSA's mid-to-high income earners. As the table reveals, more than two-in-three (68%) owner homes fall into the workforce or market rate categories. Luxury homes represent the third-largest category, constituting 14% of the ownership stock. 21% of homes are within the reach of families in need of truly affordable housing.

Home prices differ meaningfully across the city's zip codes. Households earning between 80% or less of MFI will find that 85281 offers the most suitable units as a percentage of its total stock. The zip code with the highest absolute number of units in the three lowest tiers, however, is 85282. The housing stocks of 85282 and 85283 should be most appealing to those in the middle-to-upper ends of the income distribution, as indicated by their large selections of workforce and market rate homes. 85284 easily has the most expensive housing stock, with over 90% of its homes categorized as unaffordable for households earning less than $155,600.

Table 16. Breakdown of Tempe's Ownership Housing Stock by Affordability Range, 2020

Household Income by Percent of MFI	Tempe	85281	85282	85283	85284
Ownership Housing Stock					
Affordable (0-30%)	1,829	567	959	519	40
Affordable (30%-50%)	1,075	427	446	362	0
Affordable (50%-80%)	3,481	1,050	1,391	1,324	61
Workforce (80%-120%)	8,119	1,341	3,592	2,867	450
Market Rate (120%-200%)	11,896	1,635	3,834	3,865	2,637
Luxury (200% and up)	4,297	483	429	531	2,867
Total	**30,698**	**5,503**	**10,651**	**9,467**	**6,055**
	Percent Ownership Stock				
Affordable (0-30%)	6%	10%	9%	5%	1%
Affordable (30%-50%)	4%	8%	4%	4%	0%
Affordable (50%-80%)	11%	19%	13%	14%	1%
Workforce (80%-120%)	26%	24%	34%	30%	7%
Market Rate (120%-200%)	39%	30%	36%	41%	44%
Luxury (200% and up)	14%	9%	4%	6%	47%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Note: *Income categories derived from HUD estimate of median family income for the Phoenix-Mesa-Scottsdale MSA.*
Source: *2020 five-year ACS estimates.*

How does owner housing affordability vary from city to city? Table 17 displays the distributions of the ownership stocks of Tempe, Boulder, Durham, and Provo by income range. Despite having the highest MFI of the four cities, Boulder has the largest luxury stock as a share of its total ownership inventory (55%). To comfortably purchase a luxury Boulder home, a household's annual income must exceed $230,000. In each of the other three cities, workforce and market rate housing are the bulk of the owner units. Tempe's stock most closely resembles Provo's, although the former has more options for the poorest households (i.e., those earning 50% or less of MFI). Durham has the most extensive inventory for those earning between 30% and 80% of MFI.

Table 17. Breakdown of Ownership Housing Stock by City and Affordability Range, 2020

Household Income by Percent of MFI	Tempe	Boulder	Durham	Provo
	Ownership Housing Stock			
Affordable (0-30%)	1,829	1,190	2,353	579
Affordable (30%-50%)	1,075	516	5,772	248
Affordable (50%-80%)	3,481	847	16,726	1,486
Workforce (80%-120%)	8,119	1,727	17,922	4,074
Market Rate (120%-200%)	11,896	5,498	12,208	5,096
Luxury (200% and up)	4,297	11,729	4,080	2,073
Total	**30,698**	**21,507**	**59,063**	**13,557**
	Percent Ownership Stock			
Affordable (0-30%)	6%	6%	4%	4%
Affordable (30%-50%)	4%	2%	10%	2%
Affordable (50%-80%)	11%	4%	28%	11%
Workforce (80%-120%)	26%	8%	30%	30%
Market Rate (120%-200%)	39%	26%	21%	38%
Luxury (200% and up)	14%	55%	7%	15%
Total	**100%**	**100%**	**100%**	**100%**

Note: *Income categories derived from HUD estimate of median family income for the corresponding metro areas.*
Source: *2020 five-year ACS estimates.*

Supply-Demand Gap Analysis of Tempe's Ownership Inventory

While Tempe's ownership inventory may, at first glance, seem to be priced reasonably, especially in comparison to Boulder's, whether the existing stock is fulfilling the needs of Tempe residents is another matter. Gap analyses make it possible to gauge the difference between supply and demand by affordability level. A community is said to have a housing deficit if supply cannot keep pace with demand, whereas a housing surplus results from the failure of demand to match supply. To be clear, municipalities and developers will never precisely match the variety of housing required to satisfy all residents and their income levels, in part because price is not the only consideration when securing

housing. Still, a supply-demand gap analysis can assist regional stakeholders as they undertake planning efforts.

Table 18 shows that supply is failing to match demand in the lower three income tiers. In total, there is owner demand for 9,884 units at 80% or less of MFI, but just 6,385 such units currently exist. The stiff competition for housing in these tiers implies that a fair number of low-income Tempe residents have been forced into workforce or market rate housing. The demand for luxury housing also exceeds the current supply, but this likely does not have major implications for affordability, particularly given the large unit surpluses in the workforce and market rate ranges.

Table 18. Supply-Demand Gaps in the Ownership Market, 2020

Household Income by Percent of MFI	Owner Demand	Unit Supply	Gap
Affordable (0%-30%)	2,544	1,829	(714)
Affordable (30%-50%)	2,509	1,075	(1,434)
Affordable (50%- 80%)	4,831	3,481	(1,350)
Workforce (80%-120%)	5,866	8,119	2,253
Market Rate (120%-200%)	8,007	11,896	3,889
Luxury (200% and up)	6,941	4,297	(2,644)
Total	**30,698**	**30,698**	**0**

Note: *Income categories derived from HUD estimate of median family income for the Phoenix-Mesa-Scottsdale MSA.*
Source: *2020 five-year ACS estimates.*

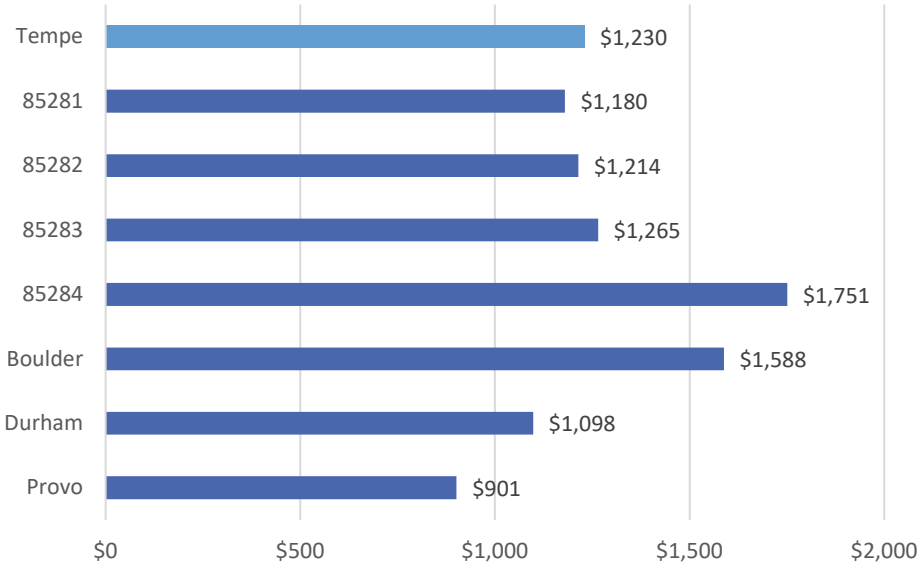
Rental Market Assessment

This section provides a thorough evaluation of Tempe's rental market. It examines trends in affordability, the prevalence of "cost-burdened" renters, and the gap between supply and demand by affordability level. Where appropriate, we include comparisons to other regions.

Cost and Affordability

Do Tempe renters meet housing costs with the same ease as the city's homeowners? How do they fare in comparison to renters located elsewhere in the U.S.? Figure 19 offers important context needed to answer these questions by displaying median gross rent across the various regions. The plot indicates that the median unit's tenant(s) pay $1,230 in rent. The lowest rates exist in the neighborhoods surrounding Arizona State. Like owner-occupied units, rental units are most expensive in zip code 85284. Of the four cities under examination, Tempe's median gross rent lags only that of Boulder, where the typical rental unit costs about $1,600 a month.

Figure 19. Median Gross Rent by Region, 2020

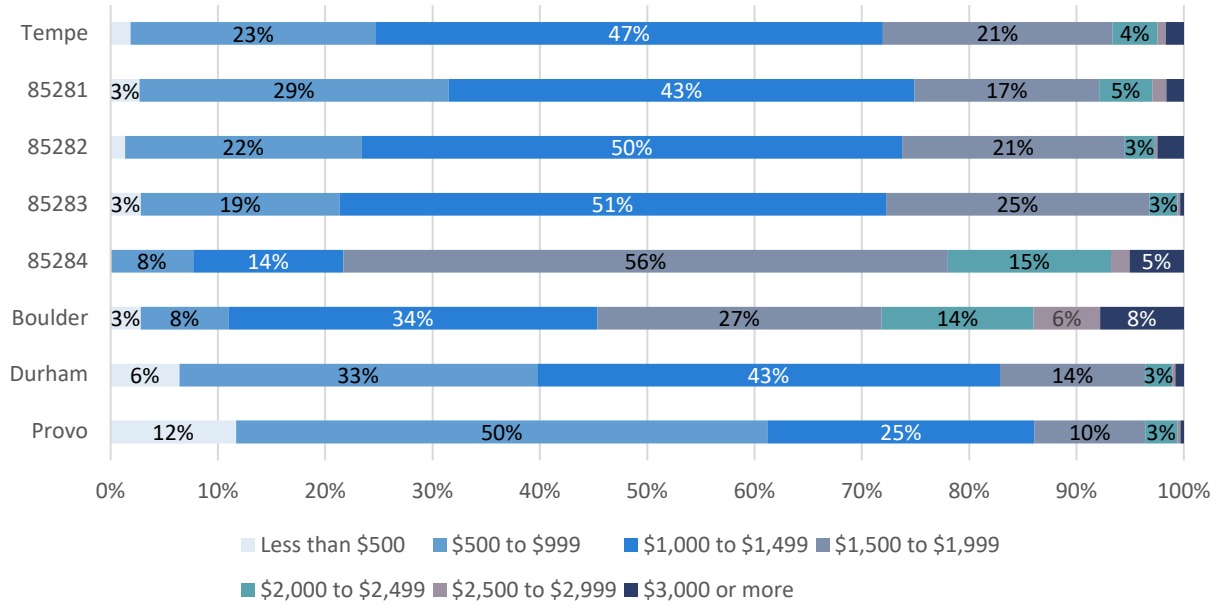


Source: *2020 five-year ACS estimates.*

The gross rent distributions for each of the regions appear in Figure 20. About half of Tempe units cost between $1,000 and $1,499 each month, a higher rate than exists in Boulder, Durham, and Provo. For those seeking to allocate less than $1,000 per month to rent, however, Tempe has fewer options than Durham and Provo, but the area within the immediate vicinity of Arizona State, predictably, has a considerable stock in this price range. Rents over $2,000 are rare in Tempe, particularly in comparison to Boulder. Overall, then, Figures 19 and 20 tell the same story: In terms

of cost, Tempe's renter-occupied inventory fares better than Boulder's but worse than Durham's and Provo's.

Figure 20. Gross Rent Distributions by Region, 2020



Source: *2020 five-year ACS estimates.*

Table 19 offers further analytical leverage over the question at hand by comparing actual median renter income to the minimum income required to comfortably afford median gross rent. In sharp contrast to the median homeowner, the median renter struggles to afford housing, devoting more than 30% of his or her income to housing costs in 2010, 2015, and 2020. Encouragingly, there is evidence that the problem has improved over the long term: In 2010, the median Tempe renter household earned only 95% of the income required to stay within the affordability threshold, but the aforementioned rise in median income over the latter half of the decade managed to almost completely close the gap by 2020. The median renter household income of the Phoenix Metro Area throughout the period was similar to Tempe's, and, accordingly, also consistently fell shy of the minimum income requirement—though sometimes by a miniscule margin.

Table 19. Rental Affordability Trends in Tempe, 2010 to 2020

Year	Median Gross Rent in Tempe	Household Income Required to Afford Median Gross Rent	Actual Median Renter Household Income of Tempe Residents	Actual Median Renter Household Income Relative to Required Income
2010	$1,052	$42,080	$40,156	95%
2015	$1,042	$41,680	$40,434	97%
2020	$1,230	$49,200	$48,261	98%

Note: *Dollar values adjusted for inflation to 2020 constant dollars.*
Sources: *2010, 2015 and 2020 five-year ACS estimates.*

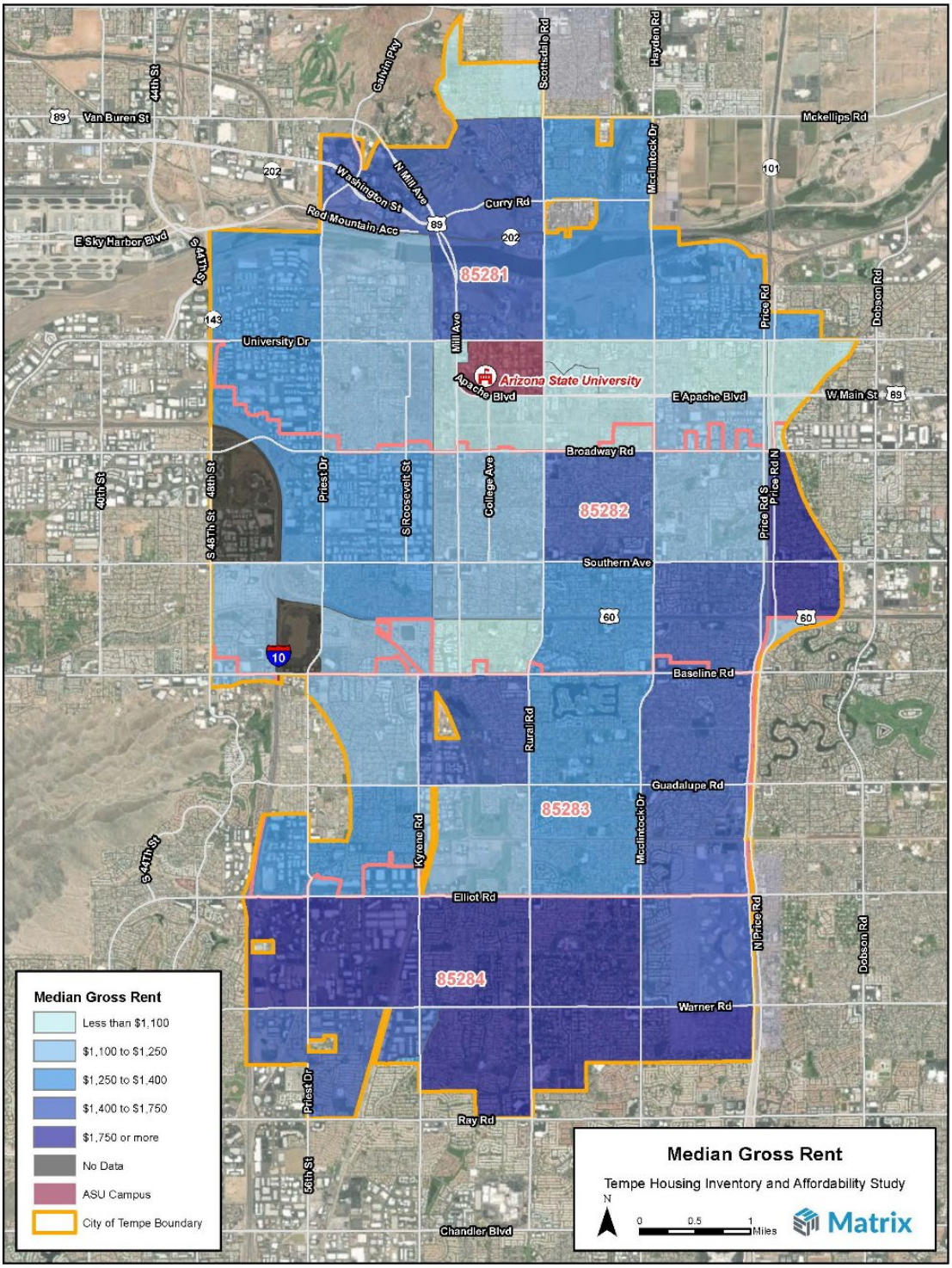
Table 20. Rental Affordability Trends in Tempe for Households Earning Median Phoenix MSA Income, 2010 to 2020

Year	Median Gross Rent in Tempe	Household Income Required to Afford Median Gross Rent	Actual Median Renter Household Income	Actual Median Renter Household Income Relative to Required Income
2010	$1,052	$42,080	$41,923	100%
2015	$1,042	$41,680	$40,561	97%
2020	$1,230	$49,200	$47,224	96%

Note: *Dollar values adjusted for inflation to 2020 constant dollars.*
Sources: *2010, 2015 and 2020 five-year ACS estimates.*

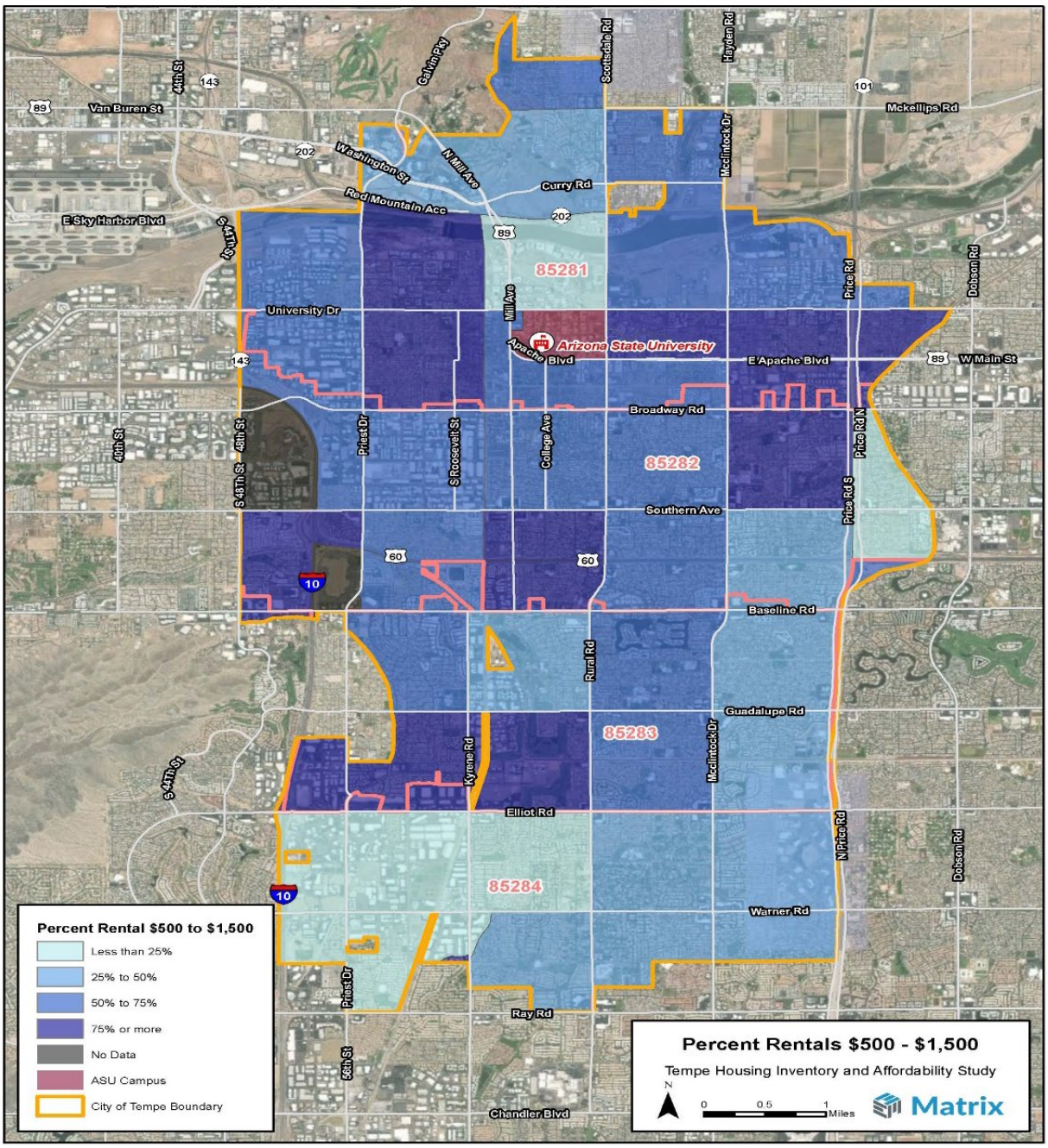
Median gross rent by Census tract is pictured in Figure 21. The geographic patterns resemble those that appear in the heat map for median home value. More costly units, in which rent exceeds $1,400, are widespread in the southernmost portion of the city. Particularly in the neighborhoods to the east of Arizona State, units with rents of less than $1,100 are the rule, rather than exception, but these units are rarer in the other regions surrounding the university. In fact, just north of the university, the median tenant pays between $1,400 and $1,750 a month. For the typical student, these costs are, of course, excessive. The main takeaways from Figure 22, in which darker colors signify neighborhoods where rents of between $500 and $1,500 are rarer, are similar.

Figure 21. Median Gross Rent by Census Tract in Tempe, 2020



Source: *2020 five-year ACS estimates.*

Figure 22. Rental Affordability by Census Tract in Tempe, 2020

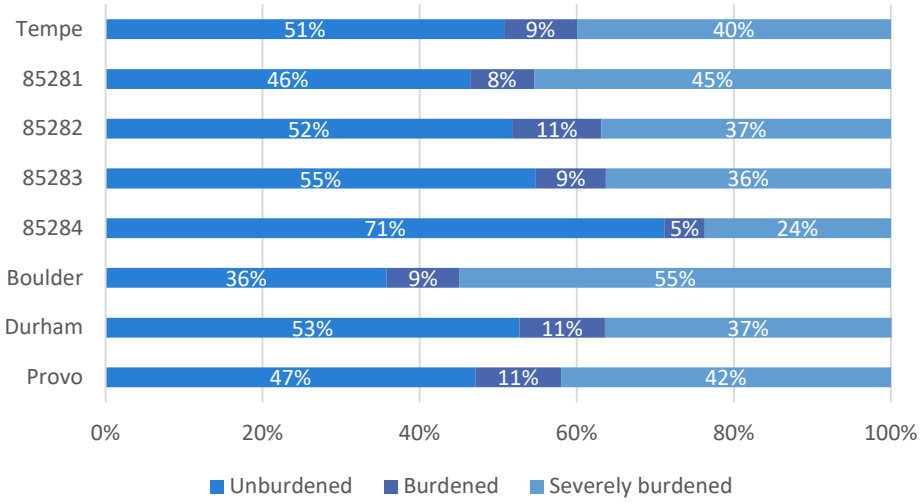


Source: *2020 five-year ACS estimates.*

Another metric of an area's rental affordability is its level of "cost-burdened" renters (see Figure 23). This demographic, according to the conventional definition, consists of renters who spend more than 30% of their incomes on housing. In Tempe, rent represents at least 30% of household income for

nearly half its occupied units. Moreover, more than four-fifths of these households are severely cost-burdened, meaning that upward of 35% of their incomes go toward rent. Severely cost-burdened renters make up more than one-third of Tempe's renters in each of its zip codes except for 85284. While Tempe's rate of cost-burdened renters is unacceptably high, these renters are even more widespread in Provo, and, especially, Boulder. It would be in the best interest of not only Tempe's residents but also the city itself for the share of cost-burdened renters to decrease in the coming years. After all, the more money residents spend on rent, the less disposable income they have to inject into the local economy.

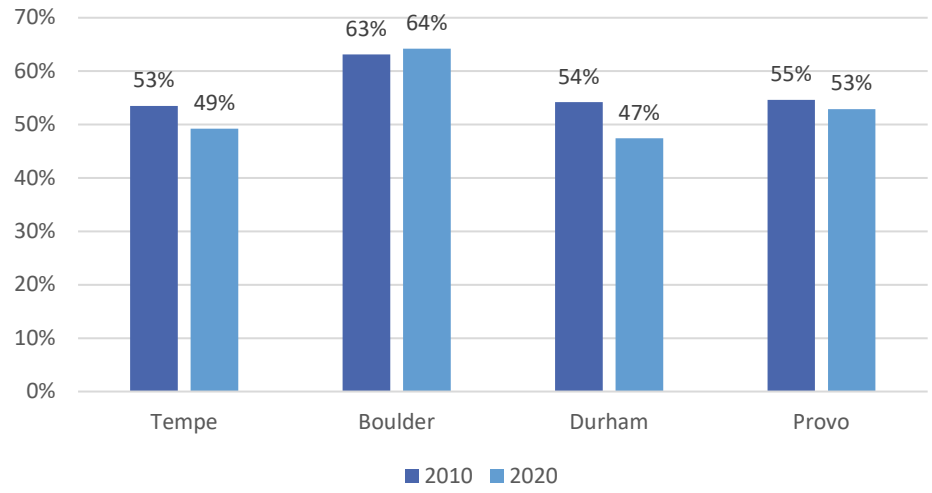
Figure 23. Household Rental Burden Composition by Region, 2020



Source: *2020 five-year ACS estimates.*

Figure 24 illustrates how the rate of cost-burdened renters in the four cities changed between 2010 and 2020. In each community except Boulder, the percentage of cost-burdened renters shrunk during this period, as the effects of the Great Recession abated. Durham experienced a seven-percentage point decline—the largest of the remaining three cities—but Tempe was able to outpace Provo, reducing its cost-burdened renter population by four percentage points. In sum, while there is still ample room for progress, Tempe has made notable strides in improving rent's affordability over the long term.

Figure 24. Percentage of Cost-Burdened Renters by City, 2010 and 2020



Sources: *2010 and 2020 five-year ACS estimates.*

Gross Rent Distribution by Affordability Range

In general, Tempe's rental stock is noticeably more favorable to low- and middle-income households than its ownership inventory (see Table 21). Rental units were sorted into affordability ranges based on the widely accepted rule that gross rent should account for no more than 30% of a household's monthly income. Under this rule, over half of rental units are regarded as workforce housing, and an additional 30% of units are affordable to households earning 80% or less of the MFI. Contrary to expectations, however, there are actually more owner than rental units at the extreme low end of the income distribution. As the table also makes evident, rental units are not evenly dispersed throughout the city. Rather, they are concentrated in zip code 85281 to accommodate Arizona State's student body. Another takeaway is that rental affordability exhibits less intracity variance than ownership affordability. In each of the four zip codes, for example, between 51% and 63% of rental units meet the definition of workforce housing. Still, a household earning considerably less than the MFI may find it more difficult to rent in 85284 than in the rest of the city.

Table 22 allows for a direct comparison of rental housing affordability across the four cities. Unexpectedly, Boulder has a robust market for low-income renters, with over 81% of its stock classified as affordable for households earning 80% or less of MFI. It is therefore possible for low-income residents to live in Boulder, provided they are willing to rent. In this regard, Boulder is apparently not an anomaly among large college towns, as evidenced by the large shares of units affordable to households earning well below MFI in Durham and Provo. Compared to the other three cities, Tempe's rental market is tilted more heavily toward households earning between 80% and 120% of MFI.

Table 21. Breakdown of Tempe's Rental Housing Stock by Affordability Range

Household Income by Percent of MFI	Tempe	85281	85282	85283	85284
	Rental Housing Stock				
Affordable (0-30%)	1,733	873	614	464	27
Affordable (30%-50%)	2,965	2,001	612	743	85
Affordable (50%-80%)	8,638	4,367	2,797	1,588	23
Workforce (80%-120%	26,072	10,427	8,106	6,949	678
Market Rate (120%-200%)	5,383	2,407	1,334	1,187	473
Luxury (200% and up)	729	311	317	37	65
Total	**45,520**	**20,386**	**13,780**	**10,968**	**1,351**
	Percent Rental Stock				
Affordable (0-30%)	4%	4%	4%	4%	2%
Affordable (30%-50%)	7%	10%	4%	7%	6%
Affordable (50%-80%)	19%	21%	20%	14%	2%
Workforce (80%-120%)	57%	51%	59%	63%	50%
Market Rate (120%-200%)	12%	12%	10%	11%	35%
Luxury (200% and up)	2%	2%	2%	0%	5%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Note: *Income categories derived from HUD estimate of median family income for the Phoenix-Mesa-Scottsdale MSA.*
Source: *2020 five-year ACS estimates.*

Table 22. Breakdown of Rental Housing Stock by City and Affordability Range, 2020

Household Income by Percent of MFI	Tempe	Boulder	Durham	Provo
	Rental Housing Stock			
Affordable (0-30%)	1,733	1,901	8,012	3,365
Affordable (30%-50%)	2,965	7,209	22,319	9,034
Affordable (50%-80%)	8,638	8,551	20,378	5,208
Workforce (80%-120%)	26,072	3,090	4,129	2,058
Market Rate (120%-200%)	5,383	425	309	213
Luxury (200% and up)	729	694	210	12
Total	**45,520**	**21,871**	**55,357**	**19,890**
	Percent Rental Stock			
Affordable (0-30%)	4%	9%	14%	17%
Affordable (30%-50%)	7%	33%	40%	45%
Affordable (50%-80%)	19%	39%	37%	26%
Workforce (80%-120%)	57%	14%	7%	10%
Market Rate (120%-200%)	12%	2%	1%	1%
Luxury (200% and up)	2%	3%	0%	0%
Total	**100%**	**100%**	**100%**	**100%**

Note: *Income categories derived from HUD estimate of median family income for the corresponding metro areas.*
Source: *2020 five-year ACS estimates.*

Supply-Demand Gap Analysis of Tempe's Rental Inventory

As mentioned above, Tempe has comparatively fewer rental units suitable for low-income residents than the other three cities. This would arguably not be problematic, however, if the existing stock meets the demands of this segment of the population regardless. Table 23 fails to allay the concerns raised by the prior analyses, demonstrating that acute shortages exist at the low end of the income distribution. For example, 11,625 households earn 30% or less of MFI, but there are only 1,733 units in the corresponding affordability range—equivalent to a deficit of 9,893 units. A large housing deficit of 4,110 units exists in the 30% to 50% of MFI range as well. Workforce housing is the only category in which there exists a surplus of units; the gap between supply and demand for this income tier is massive, at over 17,000 units.

Table 23. Supply-Demand Gaps in the Rental Market, 2020

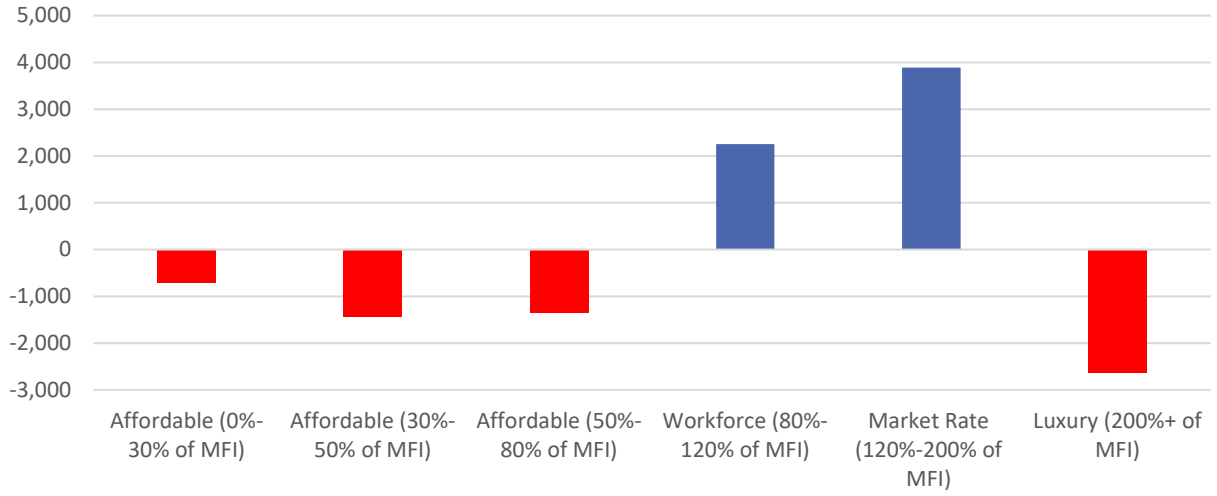
Household Income by Percent of MFI	Renter Demand	Unit Supply	Gap
Affordable (0%-30%)	11,625	1,733	(9,893)
Affordable (30%-50%)	7,075	2,965	(4,110)
Affordable (50%- 80%)	9,585	8,638	(947)
Workforce (80%-120%)	8,973	26,072	17,098
Market Rate (120%-200%)	6,409	5,383	(1,025)
Luxury (200% and up)	1,853	729	(1,123)
Total	**45,520**	**45,520**	**0**

Note: *Income categories derived from HUD estimate of median family income for the Phoenix-Mesa-Scottsdale MSA.*
Source: *2020 five-year ACS estimates.*

Key Findings and Implications

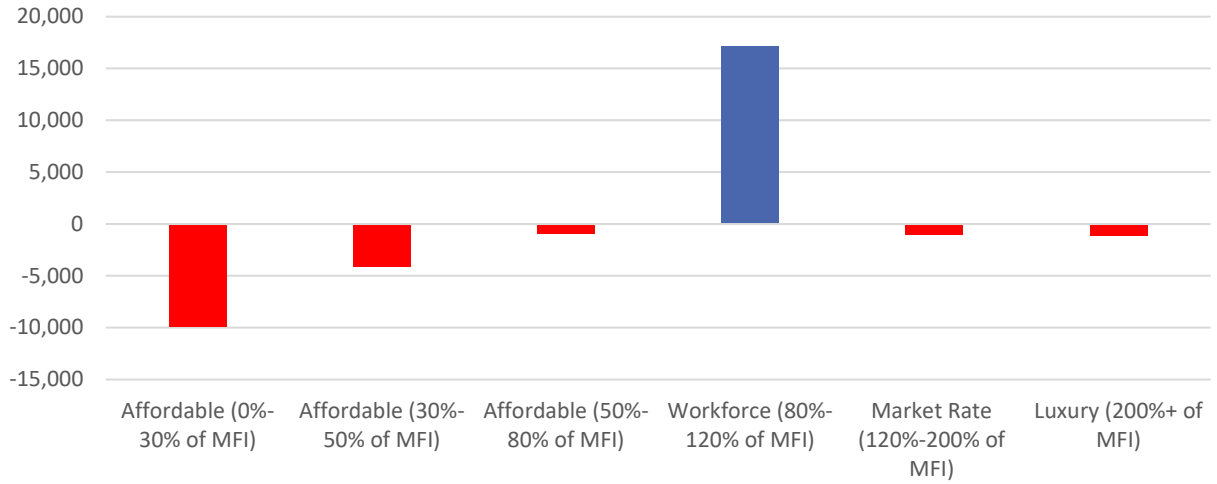
- In Tempe, over two-thirds of homes meet the definition of workforce and market rate housing, meaning their costs are excessive for households earning below 80% of MFI for the Phoenix-Mesa-Scottsdale MSA, or $93,360. These middle-class oriented homes are in sharp oversupply in the owner market, as indicated by the owner unit supply-demand gap estimates presented in Figure 25. At the same time, there are shortages of affordable and luxury owner homes, implying that low- and high-income residents are often forced to settle for inappropriately priced housing. Figure 26 presents the same estimates for the rental market, revealing that there exists a massive housing surplus in the workforce range but an almost equally large deficit in the affordable (0% to 80% of MFI) ranges. The lowest-income renters, who are disproportionately students, face the longest odds in securing suitable housing. Deficits, too, exist at the higher end of the rental market, but they are small by comparison.

Figure 25. Supply-Demand Gap by Affordability Range in Tempe's Owner Market



Note: *Positive values indicate a housing surplus. Negative values indicate a housing deficit. Income categories derived from HUD estimate of median family income for the Phoenix-Mesa-Scottsdale MSA.*
Source: *2020 five-year ACS estimates.*

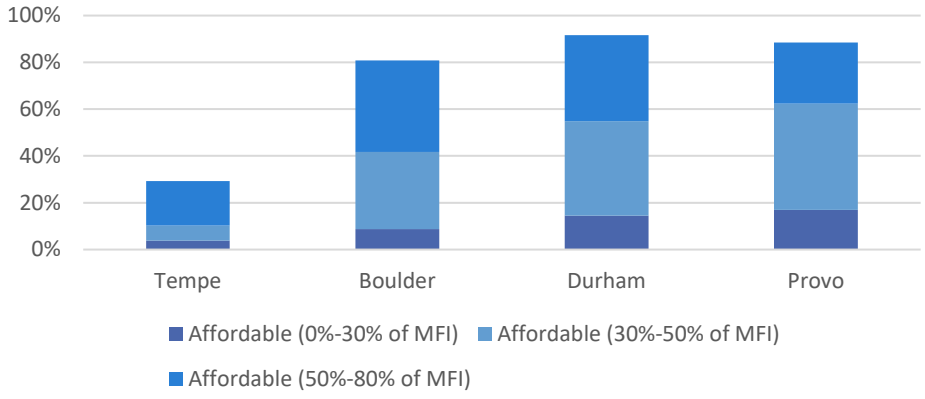
Figure 26. Supply-Demand Gap by Affordability Range in Tempe's Rental Market



Note: *Positive values indicate a housing surplus. Negative values indicate a housing deficit. Income categories derived from HUD estimate of median family income for the Phoenix-Mesa-Scottsdale MSA.*
Source: *2020 five-year ACS estimates.*

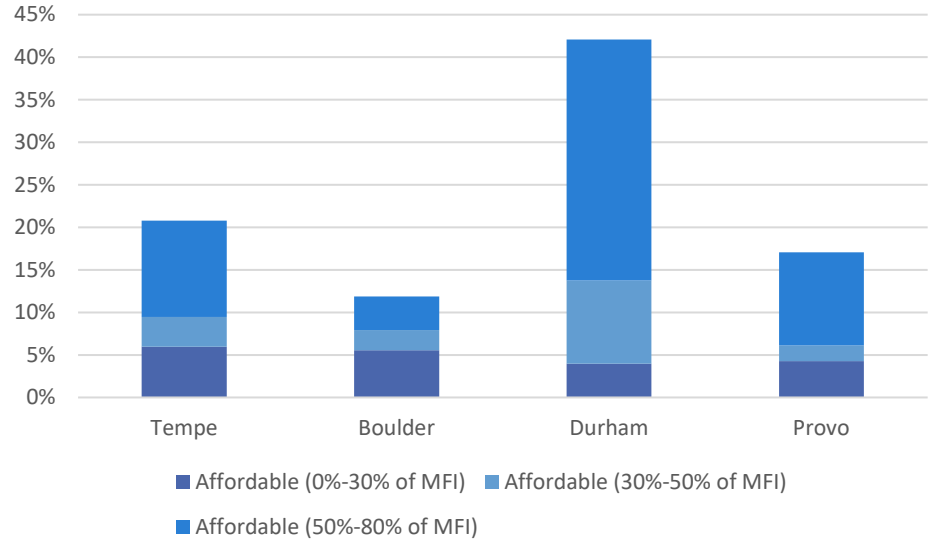
- Tempe's small stock of rental units at the 0% to 80% of MFI rate separates it from other college towns, including Durham, Boulder, and Provo. This point is made evident in Figure 27, which compares the share of rental homes in this range by city. Fewer than 30% of Tempe rental units are affordable to households earning 80% or less of MFI, whereas upward of 80% of rental units are affordable to these households in the other three cities. While Tempe is not unique in having few owner units at this rate, Durham notably has an impressive ownership stock in the 50% to 80% of MFI range (see Figure 28), suggesting that it is within the capacity of government and other stakeholders to create more options for low-income buyers.

- **Figure 27. Percentage of Affordable Rental Units by City**



- ***Note:*** *Income categories derived from HUD estimate of median family income for the Phoenix-Mesa-Scottsdale MSA.*
- ***Source:*** *2020 five-year ACS estimates.*

Figure 28. Percentage of Affordable Owner Units by City

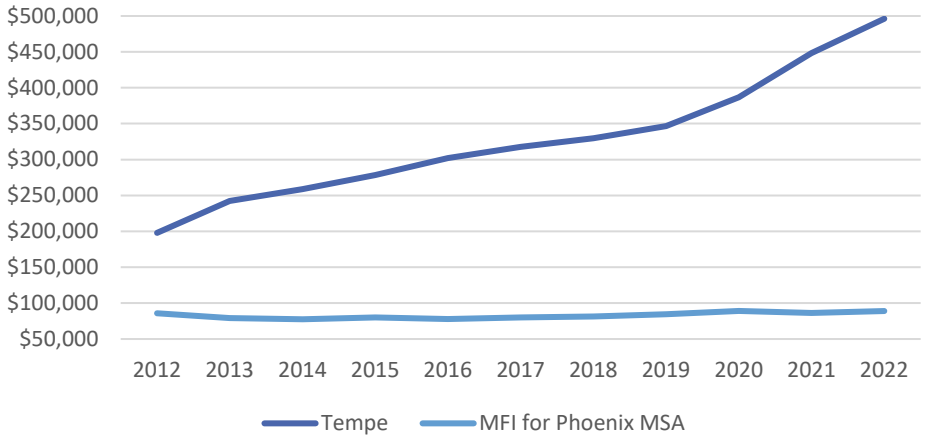


Note: *Income categories derived from HUD estimate of median family income for the Phoenix-Mesa-Scottsdale MSA.*
Source: *2020 five-year ACS estimates.*

- A consequence of the low-income rental housing shortage is that cost-burdened renters—that is, renters who spend more than 30% of their income on housing—are widespread in Tempe. By no means is this phenomenon exclusive to Tempe, however, and there are signs that the situation has improved since the conclusion of the Great Recession. These changing dynamics resulted from the tendency of incomes to increase at a faster rate than rent.

- For the most part, housing costs do not place the same strain on homeowners. Indeed, median owner household income is well above the threshold needed to cover monthly owner costs. For new buyers, however, this is less likely to be the case, as median family income for the Phoenix MSA has not risen in proportion with the median Tempe home sale price since the onset of the COVID-19 pandemic. Since 2020, as Figure 29 shows, real median family income has fallen from $89,081 to $88,800—a 0.3% decrease—whereas real median home sale price has increased by $109,266, or 28%. Due to the current state of the housing market, many prospective buyers have likely opted to delay their home purchases.

Figure 29. Trends in Median Tempe Home Sale Price and Median Family Income for Phoenix MSA, 2012 to 2022



***Notes**: Dollar values adjusted for inflation to constant 2022 dollars.*
***Sources:** Redfin; HUD.*

- There are compelling normative, economic, and practical reasons for the city and other stakeholders to focus their efforts on building more low-income rental units. These efforts would foster increased competition in this particular segment of the market and, in doing so, exert downward pressure on prices. The effects would reverberate throughout the city's economy, as previously cost-burdened renters would have an increased ability to spend money on goods, services, and other commodities. Tempe's student renters would disproportionately stand to benefit from such a market shakeup, as they would be less reliant on student loans to cover their housing costs. Relatedly, it is conceivable that Arizona State would become a more appealing option in the eyes of prospective students.

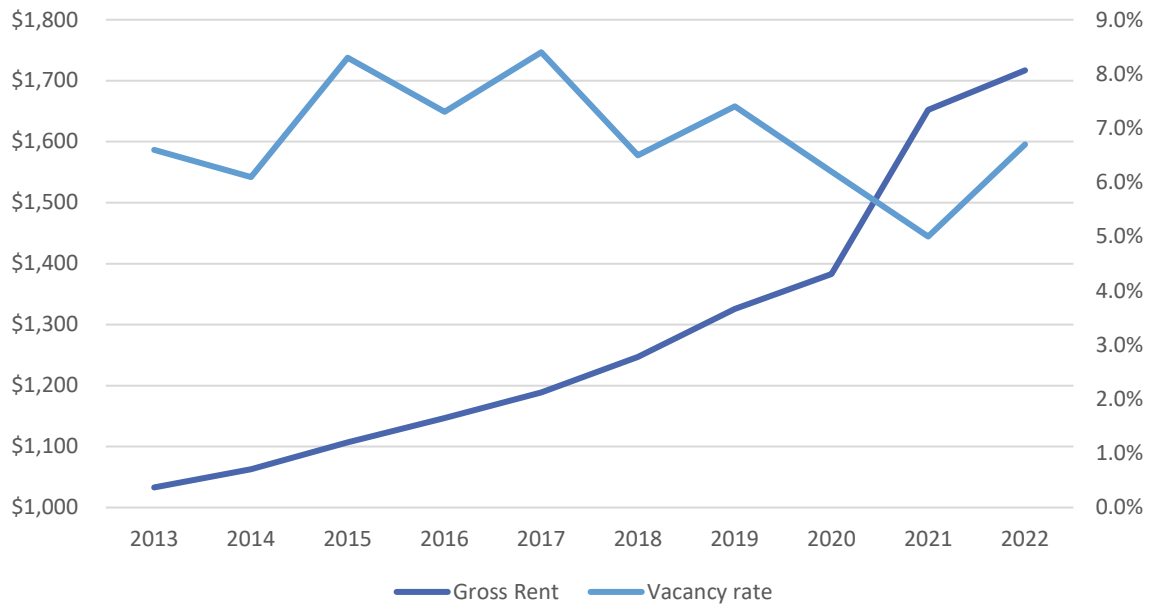
Appendix A. Multifamily Rental Cost Trends

Together, Figures 30 and 31 provide an assessment of Tempe's multifamily rental market. The data presented in the line graphs are sourced from CoStar. Figure 30 is exclusive to Tempe, depicting trends in average gross rent and vacancy rate over time. To provide further insight into the state of Tempe's multifamily rental market, Figure 31 compares average rent across Tempe and its peer communities.

The data indicate that multifamily rental prices in Tempe steadily increased for most of the past decade, before rising drastically in more recent years. In 2013, the average unit cost $1,033, compared to $1,383 in 2020, after which the trend began to accelerate. Within a span of just one year, rent increased by nearly $300, on average, even as student demand for housing fell due to Arizona State's transition to remote instruction amid the COVID-19 pandemic. Starting in 2021, the vacancy rate began to recover, increasing by almost two percentage points from a low of five percent, indicating growing demand. Simultaneously, rent continued to rise, albeit at a slower rate.

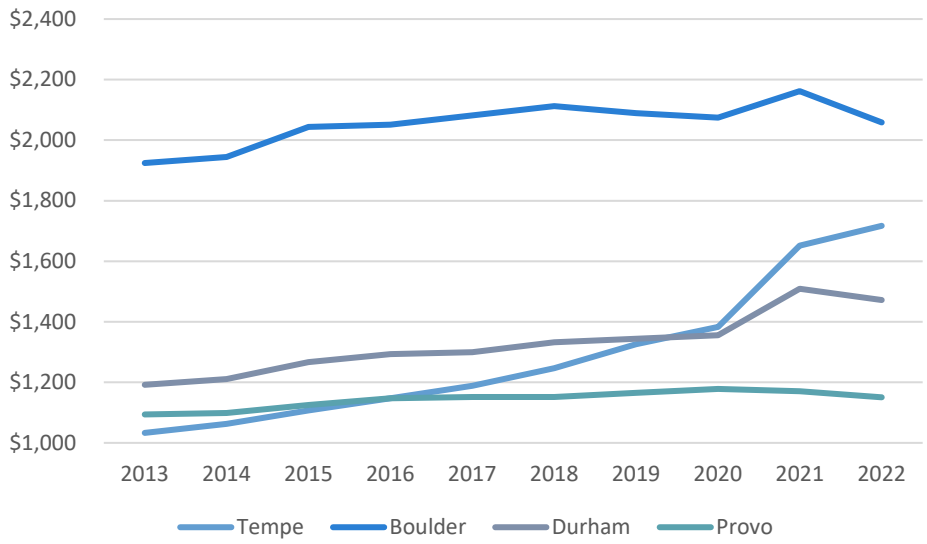
In 2013, Tempe had the lowest average multifamily gross rent of the four cities, but soon thereafter, it surpassed Provo. Average rent has remained remarkably stagnant in Provo, growing by only $57 over the past 10 years. Although rent has risen more considerably in Durham and Boulder, Tempe has seen the largest relative increase. By 2020, Tempe's average gross rent had surpassed Durham's, and, currently, only Boulder charges tenants more.

Figure 30. Average Multifamily Gross Rent and Vacancy Rate in Tempe, 2013 to 2022



***Notes**: Dollar values adjusted for inflation to constant 2022 dollars.*
***Source**: CoStar.*

Figure 31. Average Multifamily Gross Rent by City, 2013 to 2022



***Note**: Values adjusted for inflation to constant 2022 dollars.*
***Source**: CoStar.*

Appendix B. Changes in Housing Affordability, 2018 to 2020

The previous iteration of this analysis utilized 2018 ACS data. Did the situation improve or worsen in the interim? Tables 24 and 25 show how the breakdowns of the owner and rental housing inventories by affordability range changed from 2018 to 2020.

Overall, the shifts in the composition of the owner market were relatively minor. The most notable change occurred in the 50% to 80% of MFI category, which shrunk from 14% to 11% of the stock. The rental market underwent more drastic changes, especially at the price points appropriate for low-to-middle income households. Most shockingly, the share of units in the 50 to 80% of MFI fell by 28 percentage points. Conversely, the share of the rental stock composed of workforce housing grew by the same margin. The decline in the share of units in the 30% to 50% of MFI range was substantial as well. These findings suggest that the renters who have been subjected to heightened levels of market competition in recent years are those least capable of handling rent increases.

A comparison of the gap analyses for 2018 and 2020 reinforces the view that the housing market has shifted to the detriment of low-income residents in general and renters in particular. In 2018, there was an excess of owner homes in the 0% to 80% of MFI range, although households at the lower and middle segments of this tier still faced difficulty in securing affordable housing. By 2020, there was a shortage of 0% to 80% of MFI owner homes totaling about 3,500 units. The rental affordable housing stock shrunk to an even larger extent between 2018 and 2020, when what had previously been a surplus of over 20,000 homes in the 30% to 80% of MFI range became a deficit of 5,057 units. At the same time, the supply of market rate and luxury rental housing approached the level of demand.

Table 24. Change in Affordability Composition of Tempe's Ownership Stock, 2018 to 2020

Household Income by Percent of MFI	2018	2020	Percentage point change
Affordable (0%-30%)	6%	6%	0
Affordable (30%-50%)	3%	4%	1
Affordable (50%-80%)	14%	11%	-3
Workforce (80%-120%)	24%	26%	2
Market Rate (120%-200%)	37%	39%	2
Luxury (200% and up)	16%	14%	-2

Note: *Income categories derived from HUD estimate of median family income for the Phoenix-Mesa-Scottsdale MSA.*
Sources: *2018 and 2020 five-year ACS estimates.*

Table 25. Change in Affordability Composition of Tempe's Rental Stock, 2018 to 2020

Household Income by Percent of MFI	2018	2020	Percentage point change
Affordable (0%-30%)	5%	4%	-1
Affordable (30%-50%)	19%	10%	-9
Affordable (50%-80%)	49%	21%	-28
Workforce (80%-120%)	23%	51%	28
Market Rate (120%-200%)	4%	12%	8
Luxury (200% and up)	0%	2%	2

Note: *Income categories derived from HUD estimate of median family income for the Phoenix-Mesa-Scottsdale MSA.*
Sources: *2018 and 2020 five-year ACS estimates.*

Table 26. Changes in Supply-Demand Gaps in Tempe's Owner-Occupied Market, 2018 to 2020

Household Income by Percent of MFI	2018 Gap	2020 Gap
Affordable (0%-30%)	(998)	(714)
Affordable (30%-50%)	(1,212)	(1,434)
Affordable (50%-80%)	3,277	(1,350)
Workforce (80%-120%)	2,765	2,253
Market Rate (120%-200%)	(1,549)	3,889
Luxury (200% and up)	(2,283)	(2,664)

Note: *Income categories derived from HUD estimate of median family income for the Phoenix-Mesa-Scottsdale MSA.*
Sources: *2018 and 2020 five-year ACS estimates.*

Table 27. Changes in Supply-Demand Gaps in Tempe's Rental-Occupied Market, 2018 to 2020

Household Income by Percent of MFI	2018 Gap	2020 Gap
Affordable (0%-30%)	(9,289)	(9,893)
Affordable (30%-50%)	1,527	(4,110)
Affordable (50%-80%)	19,388	(947)
Workforce (80%-120%)	1,841	17,098
Market Rate (120%-200%)	(11,190)	(1,025)
Luxury (200% and up)	(2,278)	(1,123)

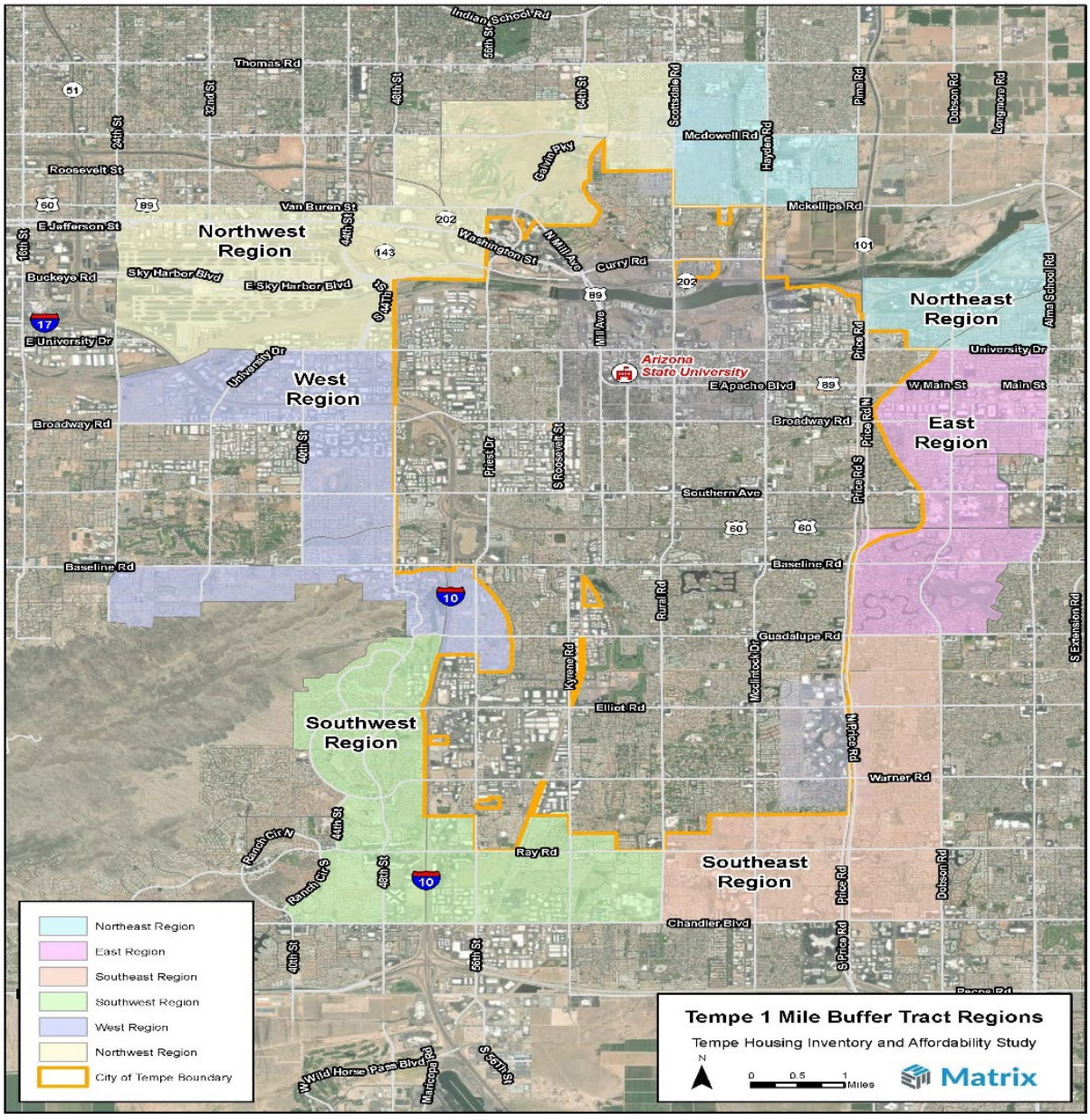
Note: *Income categories derived from HUD estimate of median family income for the Phoenix-Mesa-Scottsdale MSA.*
Sources: *2018 and 2020 five-year ACS estimates.*

Appendix C. Housing Affordability Within One-Mile Buffer

How does Tempe compare to the region immediately surrounding its borders in terms of housing affordability? The answer to this question is of particular significance, given that the communities in Tempe's immediate vicinity represent its closest competition for residents—especially those who work or attend school in the city. As a first step in performing the comparative analysis, Matrix's GIS analysts identified a one-mile buffer emanating from municipal boundaries. Figure 32 pinpoints the confines of the buffer region. Technically, the region does not represent a precise one-mile buffer, but rather a group of Census tracts with more than 25% of their land mass located within the buffer region. The Matrix team further parsed the buffer region into six regions. Of note is that the northeast region is missing a tract, because less than 25% of its land is contained within the buffer region. Due to the rural orientation of this tract, however, its exclusion has minimal impact on the analysis.

Four of Tempe's six buffer regions offer a higher percentage of homes in the 0% to 80% of MFI range than the city itself (see Tables 28 and 29). The largest relative affordable housing stock exists in the western region, where about half the units fall within this range. The region's impressive inventory of affordable owner homes, in particular, differentiates it from nearby neighborhoods. Bolstered by its unrivaled stock of rental units affordable to households earning less than $62,240, the east also has an abundance of options in the 0% to 80% of MFI range. Affordable homes are significantly less common in Tempe than in the western and eastern regions, raising the possibility that a substantial number of people commute into the city from just outside its borders.

Figure 32. Tempe One-Mile Buffer Region by Census Tract



Source: *2020 five-year ACS estimates.*

Table 28. Percent of Housing Stock Affordable to Households Earning 80% or Less of Median Family Income in Tempe and One-Mile Buffer

Household Income by Percent of MFI	Tempe	NE	East	SE	SW	West	NW
Percent Owner Housing Stock							
Affordable (0%-80%)	21%	38%	37%	6%	10%	51%	16%
Percent Rental Housing Stock							
Affordable (0%-80%)	29%	35%	53%	14%	18%	46%	43%
Percent Total Housing Stock							
Affordable (0%-80%)	26%	36%	46%	9%	13%	49%	35%

Note: *Income categories derived from HUD estimate of median family income for the Phoenix-Mesa-Scottsdale MSA.*
Source: *2020 five-year ACS estimates.*

Table 29. Breakdown of Tempe and One-Mile Buffer Housing Stocks by Affordability Range

Household Income By Percent of MFI	Tempe	NE	East	SE	SW	West	NW
Percent Owner Housing Stock							
Affordable (0%-30%)	6%	11%	9%	1%	1%	9%	2%
Affordable (30%-50%)	4%	11%	9%	1%	1%	13%	2%
Affordable (50%-80%)	11%	16%	19%	5%	8%	29%	12%
Workforce (80%-120%)	26%	28%	32%	36%	31%	29%	18%
Market Rate (120%-200%)	39%	30%	28%	45%	50%	15%	51%
Luxury (200% and up)	14%	4%	4%	12%	9%	4%	15%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Percent Rental Housing Stock							
Affordable (0%-30%)	4%	7%	3%	2%	5%	8%	4%
Affordable (30%-50%)	7%	10%	14%	3%	1%	18%	12%
Affordable (50%-80%)	19%	18%	36%	9%	12%	20%	27%
Workforce (80%-120%)	57%	49%	43%	71%	71%	49%	52%
Market Rate (120%-200%)	12%	15%	3%	14%	11%	4%	5%
Luxury (200% and up)	2%	1%	0%	1%	0%	0%	0%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Percent Total Housing Stock							
Affordable (0%-30%)	5%	9%	6%	1%	3%	9%	4%
Affordable (30%-50%)	5%	11%	12%	2%	1%	16%	9%
Affordable (50%-80%)	16%	17%	29%	6%	10%	25%	23%
Workforce (80%-120%)	45%	39%	39%	51%	48%	39%	42%
Market Rate (120%-200%)	23%	22%	13%	32%	34%	10%	19%
Luxury (200% and up)	7%	2%	2%	8%	5%	2%	4%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Note: *Income categories derived from HUD estimate of median family income for the Phoenix-Mesa-Scottsdale MSA.*
Source: *2020 five-year ACS estimates.*

Appendix D. 10-Year Housing Projections

Tables 30 and 31 offer a glimpse into the future state of the Tempe housing market. To arrive at forecasted estimates for 2030, we performed linear extrapolation on pre-2020 ACS household income, gross rent, and housing value data and HUD median family income data. The well-documented limitations of linear extrapolation compelled us to make two difficult methodological decisions. First, we opted to exclude ACS and HUD estimates from 2020 and beyond because the volatile economic conditions created by the COVID-19 pandemic meant the associated data points were outliers, which can generate implausible extrapolations. Hence, the projections essentially assume that pre-COVID trends will continue through 2030. By the same token, another caveat is that the projections do not account for the possibility of a future economic downturn or other exogeneous shocks. Second, due to the proclivity of linear extrapolation to ignore a variable's natural range, we were forced to collapse the affordability ranges into fewer categories.

The results show that Tempe's owner market will become more middle-class oriented over the next decade, with the share of workforce rate homes increasing by 22 percentage points from its 2020 total. The number of workforce units is anticipated to significantly exceed the level of workforce demand. Conversely, a large housing deficit is projected to exist at the luxury rate, suggesting the wealthiest residents may have to purchase cheaper homes than they would prefer. It is expected that surpluses will come to exist in each of the remaining affordability categories.

The trajectory for the rental market is noticeably different. Assuming the continuation of pre-2020 trends, by 2030, monthly gross rents of $860 or less, which are affordable to those earning between 0% and 30% of MFI, will be nonexistent. Middle- and higher-income earners are projected to experience housing shortages as well. A large surplus is projected to exist at the 30% to 80% of MFI level, which would represent a welcome change from 2020, when there was a shortage of 1,358 homes in this tier. While the results for both rental and owner homes are, in some respects, encouraging, it is important to reiterate that the forecasts do not factor in the effects of COVID-19 on the housing market. Accordingly, for these projections to become reality, the city almost certainly must take concrete action to reduce housing costs.

Table 30. Tempe Owner Market Projections by Affordability Category, 2030

Household Income by Percent of MFI	Percent of Stock	Owner Demand	Unit Supply	Gap
Affordable (0%-30%)	5%	2,203	2,598	395
Affordable (30%-80%)	19%	7,671	9,756	2,085
Workforce (80%-120%)	48%	10,752	25,235	14,483
Market Rate (120%-200%)	21%	4,935	10,956	6,020
Luxury (200% and up)	7%	17,892	3,650	(14,242)

Note: *Projections estimated using linear extrapolation on pre-2020 five-year ACS data and HUD median family income data. Because the various categories associated with demand and supply were extrapolated separately, total owner demand does not equal total unit supply.*
Source: *2013 through 2019 five-year ACS estimates.*

Table 31. Tempe Rental Market Projections by Affordability Category, 2030

Household Income by Percent of MFI	Percent of Stock	Renter Demand	Unit Supply	Gap
Affordable (0%-30%)	0%	9,270	0	(9,270)
Affordable (30%-80%)	93%	24,347	62,212	37,865
Workforce (80%-120%)	4%	11,749	2,787	(8,692)
Market Rate and Luxury (120% and up)	3%	7,760	1,688	(6,072)

Note: *Projections estimated using linear extrapolation on pre-2020 five-year ACS data and HUD median family. Because the various categories associated with demand and supply were extrapolated separately, total owner demand does not equal total unit supply.*
Source: *2015 through 2019 five-year ACS estimates.*