



Regulating ADUs in California:

Local Approaches
& Outcomes

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Executive Summary

Accessory dwelling units (ADU) are often mentioned as a key strategy in solving the nation's housing problems, including housing affordability and challenges associated with aging in place. However, we know little about whether formal ADU practices—such as adopting an ordinance, establishing regulations, and permitting—contribute to these goals.

This research helps to fill this gap by using data from the Turner California Residential Land Use Survey and the U.S. Census Bureau to understand the types of communities engaging in different kinds of formal ADU practices in California, and whether localities with adopted ordinances and less restrictive regulations have more frequent applications to build ADUs and increasing housing affordability and aging in place. Findings suggest that three distinct approaches to ADUs are occurring in California: 1) a more restrictive approach in disadvantaged communities of color, 2) a moderately restrictive approach in highly advantaged, predominately White and Asian communities, and 3) a less restrictive approach in diverse and moderately advantaged communities. Communities with adopted ordinances and less restrictive regulations receive more frequent applications to build ADUs, but have not yet experienced greater improvements in housing affordability and aging in place.

Overall, these findings imply that 1) context-specific technical support and advocacy may be needed to help align formal ADU practices with statewide goals, and 2) ADUs should be treated as one tool among many to manage local housing problems.

Introduction

Accessory dwelling units (ADUs) are secondary homes on single-family home properties. ADUs may take the form of standalone guest homes, attached converted garages, or basement suites. ADUs are known by many names—such as granny flats, casitas, or backyard cottages—and serve diverse functions. For instance, ADUs may provide shelter to caretakers or dependents or be rented out, offering extra income to property owners. ADUs may be legally permitted or extralegal, constructed informally without official sanction.

ADUs have long been mentioned as a key strategy in the toolbox of options that localities can use to enable and sustain housing affordability and aging in place (e.g., Caves, 1986; Howe, 1990; Cobb & Dvorak, 2000; Chapman & Howe, 2001; Wegmann & Chapple, 2014; Been, Gross, & Infranca, 2014; Mukhija, 2014; Pfeiffer, 2015; Niedt & Anacker, 2016; Brown, Mukhija, & Shoup, 2017; Chapple, Wegmann, Mashhood, & Coleman, 2017). ADUs are attractive because they are a “hidden” and “untapped” source of affordable housing from the bottom up, meaning that their financial costs and benefits are primarily borne by individual property owners rather than real estate developers or local government. ADUs are “hidden” because they currently serve as an unregulated source of affordable housing in many jurisdictions, which may warrant preservation. ADUs are “untapped” because they can be constructed on parcels in existing single-family detached zones—the most common kind of residential zoning in the U.S.—and don’t require costly processes of parcel acquisition.

California is ripe for the kind of housing market intervention that ADUs might allow, given the state’s growing housing affordability crisis and prevalence of single-family zoned neighborhoods (Caves, 1986; Wegmann & Chapple, 2014; Brown et al., 2017).

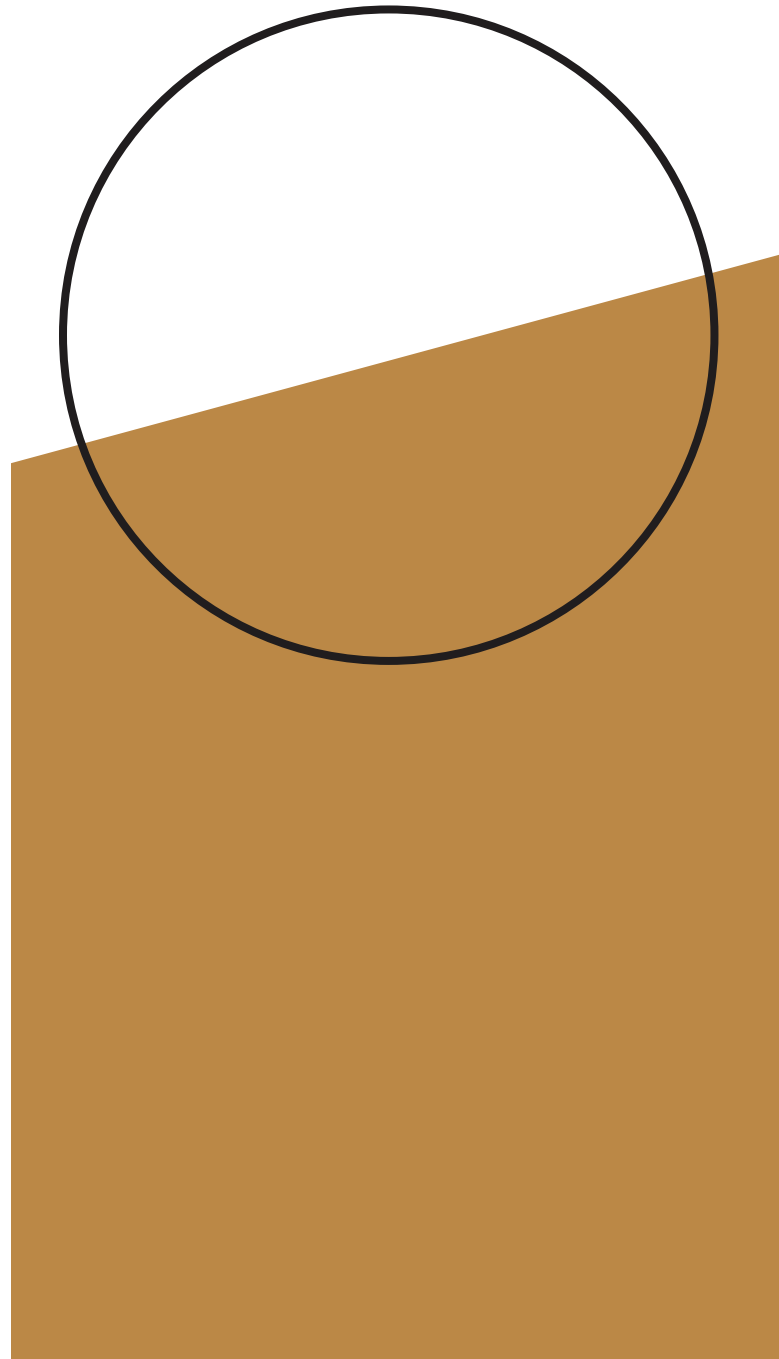
Housing production in the state has fallen far short of housing needs (Next 10, 2018; Legislative Analyst’s Office, 2015; Mawhorter, 2019). The costs of renting or buying a home have skyrocketed, especially in coastal communities. By 2018, California had the second and third highest housing costs in the nation for owners with a mortgage and renters respectively, a situation that has encouraged many residents to leave the state (Next 10, 2018). Scholars and advocates have demonstrated how ADUs could help alleviate the state’s housing affordability crisis if built on a large scale, although the capacity for ADUs to meet low-income housing needs on their own is questionable (e.g., Chapple, Wegmann, Nemirow, & Dentel-Post, 2011; Wegmann & Chapple, 2014; Brown et al., 2017; Ramsey-Musolf, 2018).

The California Legislature has long recognized the important role that ADUs can play in remedying the state’s housing shortfall by passing laws that remove barriers to ADU construction and allowing them to count towards meeting localities’ fair share of regional low-income housing needs (Caves, 1986; California Department of Housing and Community Development, 2017; Ramsey-Musolf, 2018). Revisions to ADU law in the late 2010s made it even easier for homeowners to build ADUs and bring existing units into compliance (California Department of Housing and Community Development, 2019, 2018, 2017). Ministerial review is now required for ADUs that meet parking, maximum attached unit size, and setback requirements; further, localities are required to allow ADUs in all single and multifamily zones and impose low or waived parking space requirements and utility connection or capacity fees. Other changes include processes to bring unpermitted ADUs into compliance and standards for “junior ADUs,” which are built from a home’s interior space (e.g., an adapted

bedroom suite). Localities also are prohibited from banning ADUs outright and must limit their review of ADUs to state standards in the absence of a compliant local ordinance.

Little is known about the kinds of places that are embracing or not embracing ADUs in California, how local regulations differ, and how diverse kinds of approaches to ADUs might lead to different outcomes. This research helps to fill this gap by integrating data from the Turner California Residential Land Use Survey with U.S. Census data on local demographic and housing market characteristics to identify the kinds of places adopting different approaches to ADUs, and how these approaches relate to changes in housing affordability and aging in place. The findings show that more disadvantaged communities of color are most likely to approach ADUs restrictively, while more racially and ethnically diverse and socioeconomically stable communities are more likely to approach ADUs less restrictively. Further, less restrictive regulations are associated with more frequent ADU applications—a proxy for production—but not improvements to housing affordability or aging in place, which suggests that ADUs should be used as a complementary, instead of a primary, strategy to solving these crises in California.

The report proceeds as follows. The following section introduces the data and methods used in the analysis. Subsequent sections tell the story of how California localities are regulating ADUs, and how these regulations relate to trends in ADU applications and housing affordability and aging in place. The conclusion revisits the key findings and discusses ways to translate this knowledge to action.



Methodology

Data

The main data source for this research is the Turner California Residential Land Use Survey (Mawhorter & Reid, 2018). The survey offers a comprehensive perspective on land use regulations among California's jurisdictions, such as zoning and affordable housing regulations and approval procedures. Questions were informed by prior local land use surveys, including the Brookings National Survey on Local Residential Development Regulation (Pendall, Puentes, & Martin, 2006) and the Wharton Survey on Residential Land Use Regulation (Gyourko, Saiz, & Summers, 2008). The survey instrument was reviewed by leading local land use experts prior to dissemination.

An online link to the survey was emailed to planning staff in California's 482 incorporated cities and 57 counties (covering the unincorporated areas) in August 2017. Participants were given one year to complete the survey. Most participants completed the survey online, though participants also had the option of completing the survey through a fillable PDF file. Student researchers followed up with non-respondents by email and phone. Half of the jurisdictions participated in the survey (252 cities and 19 counties), which represents 70% of the state's population.

This analysis uses the 252 cities and towns' survey responses to questions about their ADU standards and regulations to assess associated local characteristics and relationships to ADU production and change in housing conditions. These questions included:

1. Whether the locality had adopted a local ADU ordinance
2. The minimum ADU lot size square footage
3. The maximum ADU total floor area square footage
4. Off-street parking space standards
5. The fees imposed on ADUs

The variable ADU minimum lot size was transformed into a ratio of the ADU to typical single-family detached home minimum lot size, as specified by the locality's zoning code, to capture whether ADUs were limited to larger than typical lots. The remaining variables were not transformed. Localities with lower ADU minimum lot size proportions, off-street parking space standards, and fees and higher maximum unit sizes are less restrictive than localities with the opposite regulations. The least restrictive localities are those that reported not regulating these factors, which I refer to as localities that "lack standards" in the analysis.

Table 1 and Figure 1 offer a birds-eye view of how the California localities surveyed regulated ADUs in 2017 and 2018. Two-thirds of the jurisdictions had adopted a local ADU ordinance; 23% were in the process of adopting an ordinance, and 10% had not adopted an ordinance (see Table 1). Figure 1 shows a clear divide between Northern and Southern California in ordinance adoption, with localities that have adopted ordinances being more concentrated in the former than the latter. Further, localities that were not even in the process of adopting an ordinance were more likely to be located in Southern California coastal or outer ring suburban or exurban areas.

Most of the localities regulated the maximum unit size of ADUs and charged fees for constructing an ADU (see Table 1). Only 3% and 6% of localities reported lacking standards for these regulations respectively. Restricting ADUs to lots of a particular size and requiring off-street parking spaces were less common, with between 16% and 19% of localities reporting lacking standards for these features. On average, localities limited ADUs to lots larger than 6,400 square feet, which usually included all single-family detached housing lots in the jurisdiction, and a maximum unit size of about 1,100 square feet. One off-street parking spot typically was required, along with a fee of about \$9,250.¹

¹ State ADU standards specify a maximum floor area of 1,200 square feet and one parking space per unit (California Department of Housing and Community Development, 2016). Some of the surveyed jurisdictions reported having standards that are now out of compliance with state law.

Table 1: ADU Regulations by Ordinance Status

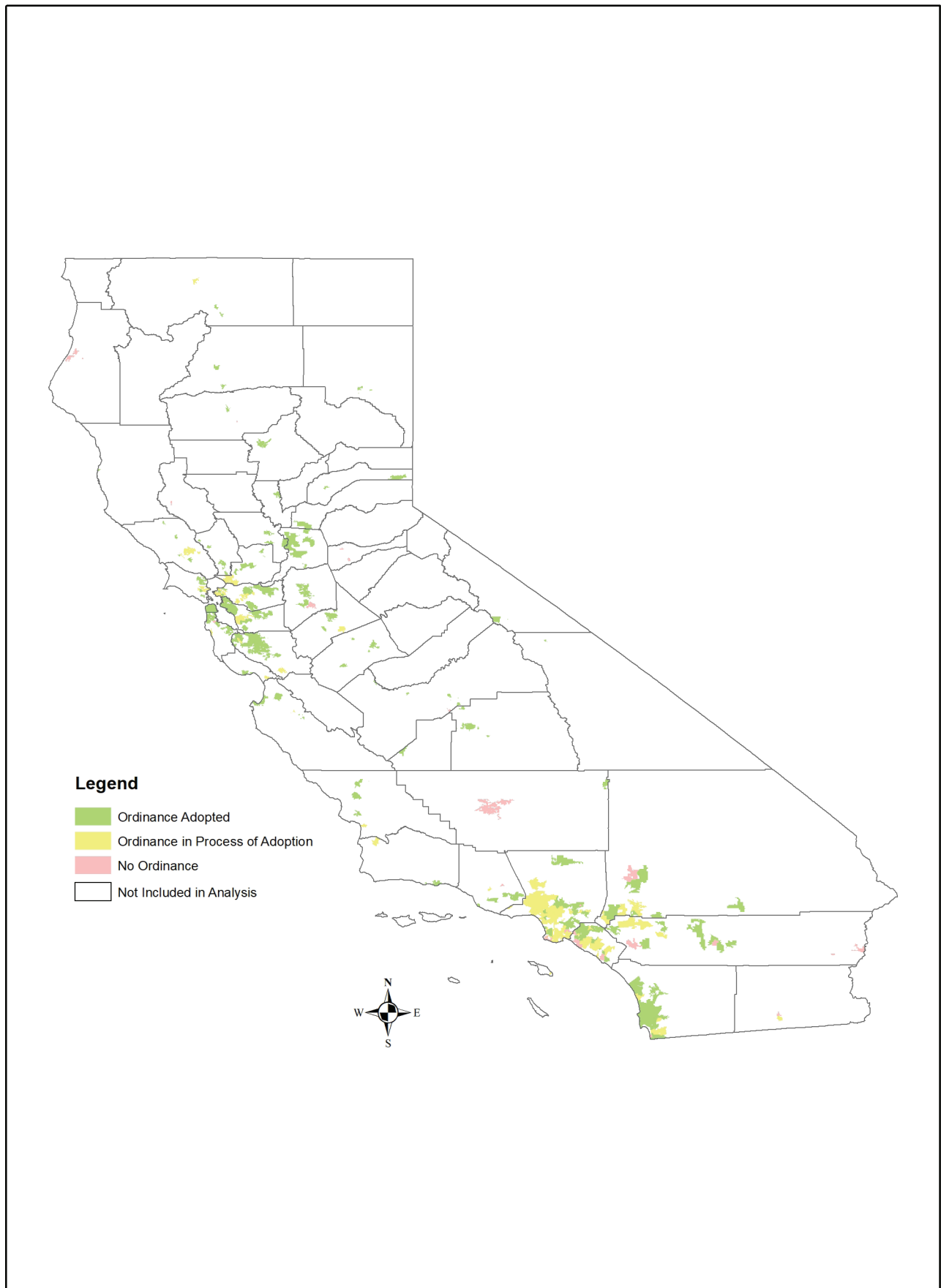
Regulations	Ordinance Status			Total				
	Adopted	In Process	None					
Minimum Lot Size (sqft)								
Has Standard (%)	48	50	52	49				
Average Standard	6,558	5,667	7,600	6,457				
Lacks Standard (%)	22	3	8	16				
Missing (%)	30	47	40	35				
Total (%)	100	100	100	100				
Ratio of ADU to SFH Minimum Lot Size								
Has Standard (%)	45	50	52	47				
Average Standard	0.98	0.92	1.01	0.97				
Lacks Standard (%)	22	3	8	16				
Missing (%)	33	47	40	37				
Total (%)	100	100	100	100				
Maximum Unit Size (sqft)								
Has Standard (%)	91	73	44	82				
Average Standard	1,122	1,010	1,495	1,118				
Lacks Standard (%)	2	2	12	3				
Missing (%)	7	25	44	15				
Total (%)	100	100	100	100				
Off Street Parking (spaces)								
Has Standard (%)	68	68	44	65				
Average Standard	1.04	1.04	1.27	1.05				
Lacks Standard (%)	22	10	16	19				
Missing (%)	10	22	40	16				
Total (%)	100	100	100	100				
Fees (\$)								
Has Standard (%)	51	46	24	48				
Average Standard	\$9,298	\$9,298	\$8,347	\$9,250				
Lacks Standard (%)	7	7	0	6				
Missing (%)	42	47	76	46				
Total (%)	100	100	100	100				
Total	168	(67%)	59	(23%)	25	(10%)	252	(100%)

Source: Mawhorter and Reid (2018)

Note: Averages for standards calculated using listwise deletion. Localities without standards were excluded from mean value calculations for the indicator.

**p<0.01, * p<0.05; two-tailed test

Figure 1: ADU Ordinance Status



Source: Mawhorter & Reid (2018)

ADU permitting and production were proxied using information that localities provided on the frequency of ADU applications received (see Table 2). Most California jurisdictions experienced somewhat frequent applications for ADUs. About two-thirds of the localities reported receiving ADU applications monthly or several times a year, while 15% of localities reported receiving ADU applications at least weekly. In contrast, 20% of localities reported receiving ADU applications once per year or less. Localities without ordinances at least in progress were less likely to receive ADU applications; about 46% of these localities received applications only once a year or less compared to 17 to 18% of localities with at least an ordinance in progress. These localities also were extremely unlikely to have weekly ADU applications, with 4% of localities reporting this frequency compared to 16% to 17% of localities with at least ordinances in progress. In turn, localities with adopted ordinances were more likely to report receiving ADU applications monthly (28% vs. 19% and 8% for localities without adopted ordinances).

Table 2: ADU Application Frequency by Ordinance Status

Application Frequency (%)	Ordinance Status			Total
	Adopted	In Process	None	
Most Weeks or More	16	17	4*	15
Most Months	28*	19	8**	24
Several Times Per Year	39	46	42	41
Once Per Year or Less	17	18	46*	20
Total	100	100	100	100
Missing	1	3	4	2
Total	168	(67%) 59	(23%) 25	252
		(100%)	(100%)	

Source: Mawhorter and Reid (2018)

**p<0.01, * p<0.05; two-tailed test

The ADU application frequency categories were collapsed into two categories in the statistical analysis: 1) at least most months or more, or 2) less than most months. Readers should keep in mind that ADU application frequency likely relates to, but does not fully capture, permitting, as a portion of applications received may be denied. The variable captures ADU production even less perfectly. Various factors may lead approved units to never be built. Further, a large portion of ADUs built in California are informal, meaning that their owners do not go through a formal permitting process (Chavez & Quinn, 1987; Mukhija, 2014; Wegmann, 2015; Wegmann & Mawhorter, 2017). Thus,

this analysis captures demonstrated demand for formal ADU production (willingness to build) rather than ADU permitting or production (units built) per se.

I assessed the link between ADU practices and changes in three housing conditions from 2010 to 2017: the proportions of 1) owners, 2) renters paying 50% or more of their income on housing respectively (henceforth noted as experiencing a “severe housing burden”), and 3) the proportion of seniors age 65 and older that reported living in the same house one year ago (a proxy for aging in place). The data were collected from the U.S. Census 2010 and 2017 five-year American Community Surveys (henceforth referred to as data from 2010 and 2017).

Accounting for changes in the severe renter and owner housing burden only partially captures housing affordability dynamics. These measures likely are correlated with—but do not fully account for—housing affordability trends, given that they fail to account for household size or spending preferences (Stone, 1993). In turn, these measures don’t account for residential mobility. For example, increasing housing affordability might signal that more affluent newcomers are displacing less affluent long-term residents (see Next 10 (2018) for recent California migration trends). However, this approach to capturing housing affordability remains standard due to good data availability, despite these limitations.

Additional variables from the survey that were potentially associated with ADU regulations or intervened in the relationships among regulations, application frequency, and housing affordability and aging in place were included in the analysis (see Table 3). The intervening factors fell into two categories: regulatory and capacity factors and political climate. I also incorporated data on local demographic, socioeconomic, and housing conditions from the U.S. Census. Conditions in time (2017) and over time (2010 to 2017) were captured for many of these variables (see Table 3). Finally, I included additional regulatory and capacity, political climate, and housing market factors for analyses related to changes in the proportion of renters and owners experiencing severe housing burdens (see “Additional Controls for Change in Housing Outcome Models” in Table 3).

Table 3: Variables Included in the Analysis

Variable	Description	Units	Function	Source
ADU Practices				
Ordinance Adopted	Whether the locality had adopted a local ADU ordinance in 2017 - 2018.	(0,1)	Explanatory	TCCRLUS
Regulation Index	The restrictiveness of local ADU regulations in 2017 - 2018; lower values signify less restrictive regulations.	Mean standardized z-score	Explanatory	TCCRLUS
Applications At Least Monthly	Whether the locality received ADU applications at least most months in 2017 - 2018.	(0,1)	Outcome; Explanatory;	TCCRLUS
Change in Housing Outcomes				
Renters Severe Housing Burden	The change in the proportion of renters paying 50% or more of their income on housing costs from 2010 - 2017.	% pt	Outcome	ACS
Owners Severe Housing Burden	The change in the proportion of owners paying 50% or more of their income on housing costs from 2010 - 2017.	% pt	Outcome	ACS
Seniors in Place One Year or More	The change in the proportion of seniors age 65 and older that reported living in the same house one year ago from 2010 - 2017.	% pt	Outcome	ACS
Regulatory & Capacity Opportunities or Constraints				
Single Family Homes Allowed on 50%+ of Local Land	Whether or not more than half of land was zoned to allow single-family homes in 2017 - 2018.	(0,1)	Intervening	TCCRLUS
Building Permit Process Length Is Minor or Greater Constraint on Development	Staff perceptions on whether the length of the building permit process was at least a minor constraint on development in 2017 - 2018.	(0,1)	Intervening	TCCRLUS
Infrastructure Capacity Is Moderate or Greater Constraint on Development	Staff perceptions on whether infrastructure capacity was at least a moderate constraint on development in 2017 - 2018.	(0,1)	Intervening	TCCRLUS
Parcel Configuration, Location, or Size Is Moderate or Greater Constraint on Development	Staff perceptions on whether parcel configuration, location, or size was at least a moderate constraint on development in 2017 - 2018.	(0,1)	Intervening	TCCRLUS
Incorporation Year	The year of incorporation; a proxy for capacity.	Years	Intervening	TCCRLUS
Political Climate				
Public Opposition is a Moderate or Greater Constraint on Development	Staff perceptions on whether public opposition was at least a moderate constraint on development in 2017 - 2018.	(0,1)	Intervening	TCCRLUS
Charter City	Whether or not the locality is a charter city.	(0,1)	Intervening	TCCRLUS
Council of Governments (ABAG, SCAG, Other)	The locality's membership in a council of governments (Association of Bay Area Governments (ABAG), Southern California Association of Governments (SCAG), or other).	(0,1)	Intervening	TCCRLUS
Demographics & Housing Market Conditions				
Population	The number of persons in 2017.	People	Control	ACS
Change	The percent change in the number of persons from 2010 - 2017.	%	Control	ACS
Density	The population density in 2010.	Persons per square mile	Control	ACS
Median Household Income	The median household income in 2017.	\$	Control	ACS
Change	The percent change in the median household income from 2010 - 2017 (in 2017\$)	%	Control	ACS
Latinx, Asian or Pacific Islander, White	The percent of people identifying as either Latinx, Asian or Pacific Islander, or White (non-Hispanic) in 2017.	%	Control	ACS
Change	The change in the proportion of people identifying as either Latinx, Asian or Pacific Islander, or White (non-Hispanic) from 2010 - 2017.	% pt	Control	ACS
Seniors	The percent of people who were age 65 and older in 2017.	%	Control	ACS
Change	The change in the proportion of people who were age 65 and older from 2010 - 2017.	% pt	Control	ACS

Variable	Description	Units	Function	Source
Demographics & Housing Market Conditions				
Families in Poverty	The percent of families living below the poverty line in 2017.	%	Control	ACS
Change	The change in the proportion of families living below the poverty line from 2010 - 2017.	% pt	Control	ACS
Multigenerational Households	The percent of family households with three or more generations in 2010.	%	Control	ACS
Owner Occupying Single Family Detached Households (%)	The percent of households living in owner-occupied single-family detached homes in 2017.	%	Control	ACS
Second Homes	The percent of housing units that were second or vacation homes in 2017.	%	Control	ACS
Vacant Homes	The percent of housing units that were vacant in 2017.	%	Control	ACS
Median Housing Value	The median value of owner occupied housing units in 2017.	\$	Control	ACS
Change	The percent change in the value of owner occupied housing units from 2010 - 2017 (in 2017\$).	%	Control	ACS
Median Rent	The median gross rent in 2017.	\$	Control	ACS
Change	The percent change in the median gross rent from 2010 - 2017 (in 2017\$).	%	Control	ACS
Renter Housing Burden	The percent of renters paying 30% or more of their income on housing costs in 2017.	%	Control	ACS
Owners Housing Burden	The percent of owners paying 30% or more of their income on housing costs in 2017.	%	Control	ACS
Renters Severe Housing Burden	The percent of renters paying 50% or more of their income on housing costs in 2010 and 2017.	%	Control	ACS
Owners Severe Housing Burden	The percent of owners paying 50% or more of their income on housing costs in 2010 and 2017.	%	Control	ACS
Seniors in Place One Year or More	The percent of seniors age 65 and older that reported living in the same house one year ago in 2010 and 2017.	%	Control	ACS
Additional Controls for Change in Housing Condition Models				
Multifamily Housing Project Applications At Least Monthly	Whether the locality received multifamily housing project applications at least most months in 2017 - 2018.	(0,1)	Renter Housing Burden Model Control	TCCRLUS
Single-Family Housing Project Applications At Least Monthly	Whether the locality received single-family housing project applications at least most months in 2017 - 2018.	(0,1)	Owner Housing Burden Model Control	TCCRLUS
Construction of Entirely Affordable Projects Since 2015	Whether the locality had any entirely affordable housing developments completed since 2015 in 2017 - 2018	(0,1)	Renter Housing Burden Model Control	TCCRLUS
Change in Housing Units	The percent change in the number of housing units from 2010 - 2017	% pt	Housing Outcome Models Control	ACS
Multifamily Homes Allowed on >25% of Local Land	Whether or not more than one-quarter of land was zoned to allow multifamily homes in 2017 - 2018.	(0,1)	Renter Housing Burden Model Control	TCCRLUS
Off Street Parking Spaces for Three Bedroom Single-Family Home	Off street parking spaces required for three-bedroom single-family home in 2017 - 2017.	# of spaces	Owner Housing Burden Model Control	TCCRLUS
Resident Parking Spaces for Two Bedroom Multifamily Apartment	Resident parking spaces required for two-bedroom multifamily apartment in 2017 - 2018.	# of spaces	Renter Housing Burden Model Control	TCCRLUS
Rent Control Ordinance	Whether the locality had an adopted rent control ordinance in 2017 - 2018.	(0,1)	Renter Housing Burden Model Control	TCCRLUS
Urban Growth Boundary	Whether the locality had an urban growth boundary in 2017 - 2018.	(0,1)	Renter & Owner Housing Burden Models Control	TCCRLUS

Source: Mawhorter and Reid (2018); U.S. Census Bureau (2010, 2017)

Note: Turner Center California Residential Land Use Survey is TCCRLUS; U.S. Census American Community Survey is ACS

Methods

I constructed an ADU Regulation Index to comprehensively capture the restrictiveness of localities' ADU regulations. The Index is calculated using data on localities' ADU minimum lot size ratio, maximum unit size, off-street parking spaces, and fees. These variables were normalized to a common scale using the Z-score method. This method identifies how much the value of the variable for a particular locality diverges from the average value of the variable for all of the localities by reporting how many standard deviations away from the average value the value for a particular locality is. The formula for calculating the Z score is:

$$\text{Z-score} = (\chi - \mu) / \sigma$$

where χ is the value of the variable for a particular locality, μ is the average value of the variable across all localities, and σ is the standard deviation from the average value across all localities. All of the variable values were ordered from smallest (least restrictive) to largest (most restrictive); maximum unit size was multiplied by -1 to conform with this scale.

The Z-scores were averaged across all variables to arrive at the ADU Regulation Index. The Index ranges from -2.40 (least restrictive practices) to 1.56 (most restrictive practices). Locality index percentiles also were calculated using the formula below. First, the rank (r) of each locality was determined by ordering the data in an increasing order. Then, the percentile was calculated by dividing the rank by the total number of localities. The percentiles range from 100 (least restrictive practices) to 0 (most restrictive practices).

$$\text{Percentile} = \frac{r}{(\text{total number of localities})} * 100\%$$

The Index shows how localities are regulating ADUs in California. However, the index does not perfectly capture existing regulations. A large portion of localities were missing information on at least one of the four indicators comprising the index (see Table 1).² Localities missing values for two or fewer indicators were given mean values of missing variables based on their ADU application frequency category (applications received at least most months or not).³ Localities missing more than two of the indicators were given missing values for the Index. This left a final sample of 220 localities for which the Index was calculated. It is important to note that the data were not missing at random, suggesting that there is some bias in the resulting sample.⁴ In turn, a small proportion of the localities (from 3 to 19%) did not report having standards for some of the indicators (see Table 1).⁵ Localities lacking standards were given zero values for the variables, with the exception of maximum unit size, which was given the maximum value of 12,000 to account for this condition being least restrictive.

Next, I categorized ADU practices in California by calculating descriptive statistics—such as t-tests of differences in means and proportions and latent class analysis—to capture regulatory, capacity, political, demographic, and housing market characteristics associated with different combinations of regulation restrictiveness and ordinance status.⁶ I then determined whether ADU practices were associated with ADU application frequency and

² Over one-third of localities had missing minimum lot size information; close to half (46%) of localities lacked information about fees. A much smaller proportion of localities (around 15%) lacked information about maximum unit size and off-street parking spaces. Only 35% of the localities did not have any missing values for these variables. A small proportion (13%) had missing values for at least three of the four variables.

³ The choice to assign missing values as the mean value of the indicator for localities with the same ADU application frequency is problematic, given that imputed values may not reflect actual values. This is especially the case for the maximum unit size, since that this factor was not statistically associated with application frequency (see Table 7). The other indicators (minimum lot size proportion, off-street parking, and fees) should be less biased, as they were statistically associated with application frequency. This approach has the benefit of not biasing the analysis of the link between ADU regulations and application frequency and still allowing for an analysis of the link between regulations and local characteristics. Alternative approaches include the following: 1) excluding all localities with any missing values, 2) excluding regulation variables with a high proportion of missing values, or 3) imputing values based on localities' other characteristics. The first two approaches were undesirable because they would have reduced the sample to about 1/3 in the first instance, or led to a much less comprehensive regulation index in the second. The third approach was undesirable because there is little existing theory of how local characteristics relate to ADU regulations; providing knowledge on this issue is one of the contributions of this research. Reruns of the analysis excluding participants with missing values ($n=88$) produced substantively similar relationships between the main explanatory and outcome variables (unreported but available on request), which suggests a lack of overt bias.

changes in the proportion of 1) owners, and 2) renters experiencing severe housing burdens, and 3) seniors aging in place from 2010 to 2017. I answered these questions by first exploring the data descriptively, using t-tests and correlations to assess whether there were significant differences in localities' 1) ADU application frequency, based on their ordinance status and regulatory restrictiveness, and 2) changes in housing affordability and aging in place, based on their ADU application frequency.

To account for other factors that might be related to these outcomes, I modeled relationships among ADU practices, application frequency, and housing affordability and aging in place, comparing localities with similar regulatory, capacity, political, demographic, and housing market conditions. Whether or not ADU applications were received at least monthly was modeled using a logistic specification, while changes in the housing conditions were modeled using ordinary least squares linear regression, an appropriate specification given the relatively normal distributions of these outcomes and their usually linear relationships with the explanatory factors.

There are several issues that readers should keep in mind in interpreting the modeling results. First, a large number of the survey participants did not respond to at least one of the questions from which the variables comprising the models were derived. Missing values were replaced with non-missing information from participants with similar characteristics using multiple imputation by chained equations (MICE) in Stata (White et al., 2011).⁷ Second, some of the variables initially included in the analysis, such as family poverty rates, and median housing and gross rent values and change over time, were excluded from some of the models due to their extremely high correlations with other more theoretically important variables, such as

median household income. Finally, three positively skewed variables were logged, which improved the model fit: total population, median household income, and the senior population proportion. No other overt issues were discovered in the models.

Findings

This section explores the diverse ways that California localities regulate ADUs. I first describe trends in regulating ADUs and identify three categories of localities that have distinct approaches to ADUs: 1) a more restrictive approach in more disadvantaged communities of color, 2) a moderate approach in highly advantaged predominately White and Asian communities, and 3) a less restrictive approach in diverse and moderately advantaged communities.

Next, I explore whether localities with adopted ordinances and less restrictive regulations received more frequent applications to build ADUs. I describe differences in ADU regulations and other conditions between localities that received ADU applications at least monthly and not. Then, I more precisely identify how ADU regulations relate to application frequency by using econometric modeling to compare localities with similar conditions.

Finally, I investigate whether localities that received more frequent ADU applications experienced increases in housing affordability and aging in place. I first describe changes in housing affordability and aging in place and associated local characteristics. Then, I report average changes in housing affordability and aging in place between localities with frequent and infrequent ADU applications. I use econometric modeling to further capture associations

⁴ Statistics unreported but available on request. The most prominent trend was that more disadvantaged localities (places with lower incomes and housing values, higher proportions of families in poverty and vacant homes, and increases in families in poverty) were more likely to have missing values.

⁵ Close to 20% of the localities did not have standards for off-street parking requirements, while only 3% of the localities did not have standards for maximum unit size (see Table 1).

⁶ Latent class analysis is a form of cluster analysis that uses observed variables to capture underlying groups that might exist within a population, in this case different approaches to ADU regulation.

⁷ The variables that had the most missing values in the application frequency models were the ADU Regulation Index (13%), infrastructure as a constraint on development (2 to 4%), and perceptions of public opposition to development (2 to 4%). The variables that had the most missing values in the change in housing problem models were construction of entirely affordable projects (4%) and single-family off-street parking requirements (5%). The choice to impute missing values in the econometric analysis may bias the analysis if respondents' assigned values differ from their actual values. Associations between the outcome variables and the explanatory, intervening, and control variables were similar in models where participants with missing values were excluded and included with their assigned values, with a few exceptions, which indicates a lack of overt bias (unreported but available on request).

among application frequency, affordability, and aging in place by comparing localities with similar other related conditions.

ADU Regulations Varied Widely

ADU regulations varied widely statewide. The ADU Regulation Index, which was calculated for localities reporting on at least two of the four ADU regulations, ranges from -2.40 to 1.56; the lower a locality's value on the index, the less restrictive their regulations. Localities with the lowest values reported a lack of regulatory standards, while those with the highest values had relatively stringent regulatory standards. The typical locality had an Index score of -0.02, or slightly less restrictive regulations (see Table 4). Localities without ordinances even in the process of adoption typically had less restrictive regulations, while those that were in the process of adopting an ordinance typically had more restrictive regulations (average Index score of -0.15 vs. 0.12), though these differences were not statistically

significant (see Table 4).

Figure 2 shows geographic variation in the restrictiveness of ADU regulations. Localities displayed in light green are in the top least restrictive quartile (75th percentile or above). Localities displayed in light pink are in the bottom most restrictive quartile (25th percentile or below). Localities in yellow are moderately restrictive (between the 25th and 75th percentile). Localities that are in grey do not have an Index value, because they did not report on at least two of the four ADU regulations. The map shows that the geography of ADU regulatory restrictiveness follows a radiating pattern in the Los Angeles and San Francisco regions, with communities closer to the cities of Los Angeles and San Francisco tending to be less restrictive and those located in the outer ring suburbs or exurbs tending to be more restrictive. In turn, places in the Central Valley tended to be more restrictive.

Table 4: ADU Regulation Index by Ordinance Status

ADU Regulation Index	Ordinance Status			Total
	Adopted	In Process	None	
Reported At Least Two Regulations (%)	95	80	56	87
Average Index	-0.05	0.12	-0.15	-0.02
Did Not Report At Least Two Regulations (%)	5	20	44	13
Total (%)	100	100	100	100
Total	168	(67%) 59	(23%) 25	252
			(10%)	(100%)

Source: Mawhorter and Reid (2018)

Note: Localities missing two or fewer ADU regulation indicators were given mean values of missing indicators based on their application frequency category. Localities missing more than two of the indicators or information on ADU application frequency (n=34) were excluded from the analysis. **p<0.01, * p<0.05; two-tailed test

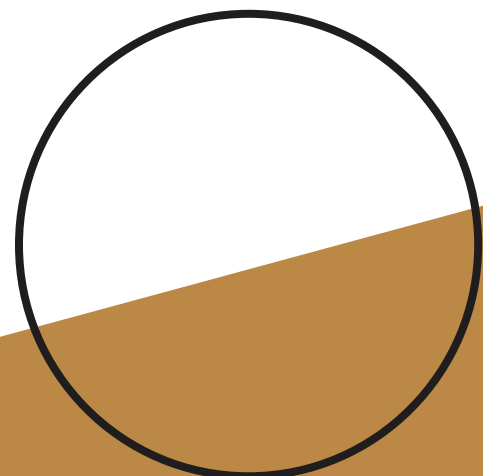
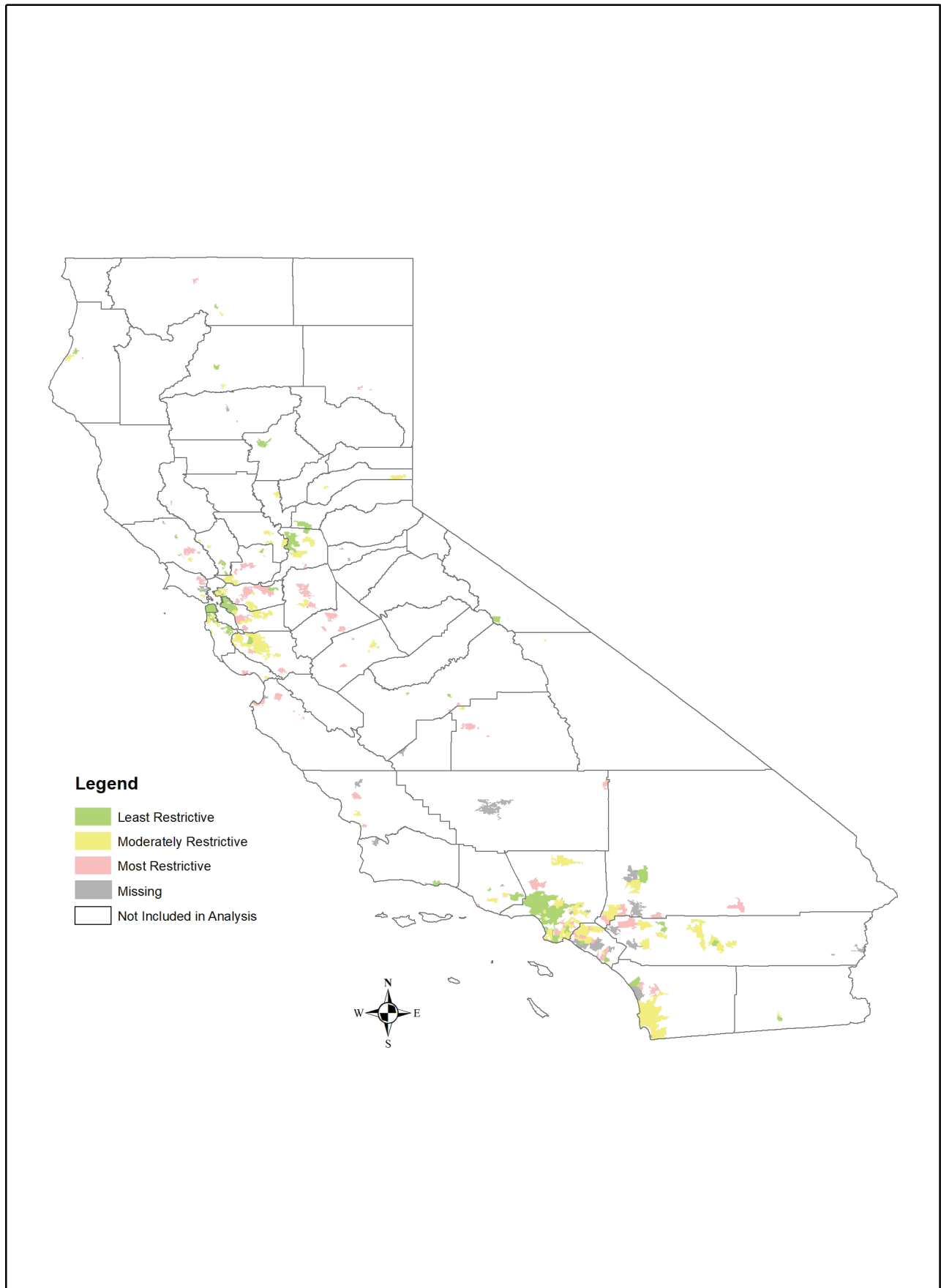


Figure 2: ADU Regulation Index



Source: Mawhorter & Reid (2018)

Detailed information on regulations by locality is included in Appendix 1. The six least restrictive localities in the state were Inglewood, Lakewood, and Pasadena in Los Angeles County, Shasta Lake in Shasta County, Arcata in Humboldt County, and San Francisco. These localities, which comprised the 98th to 100th percentile, typically imposed few (if any) regulations on ADU minimum lot size, maximum unit size, off-street parking spaces, or fees. The six most restrictive localities in the state were Walnut Creek, Brentwood, and Antioch in Contra Costa County, Gonzales in Monterey County, Atascadero in San Luis Obispo County, and Los Banos in Merced County. All of these localities imposed off-street parking requirements of between one to two spaces and extremely high fees of between \$25,000 to \$50,000.

Disadvantaged Communities of Color Had More Restrictive ADU Regulations

The restrictiveness of local ADU regulations was related to distinct demographic and housing market conditions, with more disadvantaged communities of color having more restrictive regulations. Table 5 reveals how a range of conditions compare between localities that had the least and most restrictive ADU regulations (top and bottom quartiles of the ADU Regulation Index respectively). Localities with the most restrictive regulations tended to have lower median household incomes (\$68,000 vs. \$83,000 among the least restrictive localities) and greater declines in incomes during the 2010s (-2 percentage point decline vs. 3 percentage point increase among the least restrictive localities). These localities also tended to have higher proportions of Latinxs (43 vs. 28%) and greater population growth among Latinxs and were defined by their greater rates of families in poverty (19 vs. 14%) and multigenerational households (8 vs. 5%). Their housing stocks were characterized by lower median values (\$428k vs. \$646k), and greater declines in median values over the recession (-16 vs. -6%).

Localities with the least restrictive regulations also exhibited distinct characteristics. These localities tended to house higher proportions of Whites and were becoming more advantaged over time, as evident by their greater increases in household income and declines in families in poverty. These localities also were more likely to be located within the Association of Bay Area

Governments (ABAG). Notably, there were few other statistically significant differences in the local regulatory, capacity, or political characteristics of the least and most restrictive localities. In turn, dynamics between ADU regulation restrictiveness and these local characteristics were largely the same regardless of whether or not localities had an adopted ordinance.

A three-category typology of local approaches to ADU regulations emerged from the latent class analysis (see Table 6), which I identify as “Threatened and Restrictive,” Prosperous and Moderate,” and “Diverse and Flexible.” This typology reinforces and clarifies the patterns described above. “Threatened & Restrictive” cities, which are defined by more restrictive ADU regulations, are found among more disadvantaged communities of color that are home to higher rates of multigenerational households and becoming more disadvantaged over time. The Threatened & Restrictive communities have formally attempted to regulate ADUs (most have an ordinance adopted or in progress) but they process ADU applications relatively less frequently. An estimated 32% of California localities fall into this category, including communities like South Gate in Los Angeles County, Fontana in San Bernardino County, Gilroy in Santa Clara County, Salinas in Monterey County, and Merced in Merced County.

The second category in the typology is “Prosperous & Moderate.” This approach, which is relatively rare (only an estimated 14% of localities), is found among the most advantaged communities that are home to higher proportions of Whites, Asians and Pacific Islanders, and seniors and are becoming more advantaged over time. The Prosperous & Moderate communities are defined by more moderate ADU regulations—they are less likely to be among the least or most restrictive communities. Examples include Beverly Hills and La Cañada Flintridge in Los Angeles County, Pleasanton in Alameda County, Burlingame in San Mateo County, and Los Altos Hills in Santa Clara County.

The third category in the typology is “Diverse & Flexible.” This category, which is relatively common (estimated 54% of localities) and defined by less restrictive ADU regulations, is found among communities that are whiter and more advantaged than those that are Threatened & Restrictive but more

Table 5: Local Characteristics Associated with ADU Regulations

Characteristics	Mean	Standard Deviation	Number of Obs.	All Localities		Localities with Ordinances Adopted	
				Least Restrictive Regulations	Most Restrictive Regulations	Least Restrictive Regulations	Most Restrictive Regulations
Regulatory & Capacity Opportunities or Constraints							
Single Family Homes Allowed on 50%+ of Local Land (%)	0.69	N/A	251	0.72	0.62	0.75	0.64
Minor or Greater Constraint on Development (%)							
Building Permit Process Length	0.52	N/A	248	0.57	0.48	0.53	0.47
Moderate or Greater Constraint on Development (%)							
Infrastructure Capacity	0.42	N/A	245	0.41	0.41	0.44	0.49
Parcel Configuration, Location, or Size	0.60	N/A	247	0.59	0.58	0.58	0.56
Incorporation Year	1926	41	252	1916	1924	1915*	1923
Political Climate							
Public Opposition is a Moderate or Greater Constraint on Development (%)	0.50	N/A	245	0.56	0.45	0.55	0.36
Charter City	0.32	N/A	252	0.35	0.28	0.34	0.25
Council of Governments							
ABAG	0.28	N/A	252	0.44*	0.21	0.52**	0.22
SCAG	0.40	N/A	252	0.32	0.33	0.18*	0.19*
Other	0.32	N/A	252	0.25	0.46**	0.30	0.58**
Demographics & Housing Market Conditions (2010 - 2017)							
Population	97,113	279,961	252	145,167	73,694	87,256	69,902
Change (%)	0.06	0.07	252	0.07	0.07	0.07	0.07
Density (Persons per square mile) (2010)	4,545	3,120	252	5,430	4,338	4,954	4,096
Median Household Income	\$77,744	\$37,032	252	\$83,181	\$68,278**	\$84,476	\$63,040**
Change (%) (in 2017 \$)	0.00	0.12	252	0.03*	-0.02*	0.04*	-0.03*
Race & Ethnicity							
Latinx (%)	0.35	0.24	252	0.28*	0.43**	0.28*	0.47**
Change (% pt)	0.02	0.03	252	0.01	0.03**	0.01	0.03**
Asian or Pacific Islander (%)	0.14	0.14	252	0.15	0.10**	0.14	0.09**
Change (% pt)	0.01	0.03	252	0.01*	0.01	0.01*	0.01
White (%)	0.43	0.23	252	0.48*	0.38	0.50*	0.35*
Change (% pt)	-0.04	0.04	252	-0.03	-0.04	-0.03	-0.04
Seniors (%)	0.15	0.06	252	0.16	0.13**	0.15	0.12**
Families in Poverty (%)	0.16	0.11	252	0.14*	0.19*	0.13*	0.21**
Change (% pt)	0.02	0.06	252	-0.01*	0.02	-0.01**	0.01
Multigenerational Households (%) (2010)	0.06	0.04	252	0.05**	0.08*	0.05**	0.08**
Owner Occupying Single Family Detached Households (%)	0.48	0.15	252	0.47	0.50	0.48	0.49
Second Homes (%)	0.03	0.07	252	0.03	0.01**	0.03	0.01*
Vacant Homes (%)	0.05	0.03	252	0.06	0.05	0.05	0.05
Median Housing Value	\$562,104	\$403,351	252	\$645,854	\$427,698**	\$646,461	\$376,483**
Change (%) (in 2017 \$)	-0.09	0.22	252	-0.06	-0.16**	-0.06	-0.18**
Median Rent	\$1,491	\$481	252	\$1,563	\$1,361**	\$1,557	\$1,298**
Change (%) (in 2017 \$)	0.06	0.11	251	0.08	0.05	0.09	0.05
Housing Burden (%)							
Renters	0.52	0.09	252	0.49	0.53*	0.49	0.53*
Owners	0.32	0.05	252	0.32	0.32	0.31	0.32
Severe Housing Burden (%)							
Renters	0.26	0.06	252	0.25	0.26	0.25	0.26
Owners	0.13	0.04	252	0.13	0.13*	0.13	0.13
Total			252	57	61	44	36

Source: Mawhorter and Reid (2018); U.S. Census Bureau (2010, 2017)

Note: Localities with “least” and “most” restrictive regulations are in the top and bottom quartile of the ADU Regulation Index respectively. Averages calculated using listwise deletion.**p<0.01, * p<0.05; two-tailed test

Table 6: Marginal Means for Typology of Local Approaches to ADU Regulations, Predictive Characteristics Only

Characteristics	Threatened & Restrictive		Prosperous & Moderate		Diverse & Flexible	
ADU Regulations						
ADU Regulation Index	0.19		-0.09		-0.11	
Least Restrictive Regulations (%)	0.12		0.26		0.34	
Most Restrictive Regulations (%)	0.43		0.09		0.24	
Ordinance Adopted (%)	0.58		0.66		0.72	
No Ordinance in Progress (%)	0.09		0.11		0.10	
Applications At Least Monthly (%)	0.28		0.42		0.46	
Demographics & Housing Market Conditions (2010 - 2017)						
Population						
Change (%)	0.07		0.07		0.06	
Median Household Income (Ln)	10.91		11.85		11.15	
Change (%) (in 2017 \$)	-0.04		0.07		0.00	
Race & Ethnicity						
Latinx (%)	0.63		0.09		0.25	
Change (% pt)	0.03		0.00		0.02	
Asian or Pacific Islander (%)	0.10		0.21		0.15	
Change (% pt)	0.01		0.04		0.01	
White (%)	0.19		0.65		0.51	
Change (% pt)	-0.03		-0.05		-0.04	
Seniors (%)	0.10		0.20		0.15	
Change (% pt)	0.02		0.04		0.02	
Families in Poverty (%)	0.25		0.04		0.15	
Change (% pt)	0.03		-0.01		0.02	
Multigenerational Households (%) (2010)	0.11		0.03		0.05	
Owner Occupying Single Family Detached Households (%)	0.46		0.63		0.46	
Second Homes (%)	0.01		0.04		0.03	
Vacant Homes (%)	0.05		0.06		0.05	
Change in Median Home Value (%) (in 2017 \$)	-0.19		0.27		-0.12	
Renters with Housing Burden (%)	0.56		0.41		0.52	
Owners with Severe Housing Burden (%)	0.14		0.15		0.13	
Seniors in Place One Year or More (%)	0.93		0.95		0.93	
Marginal Probability	0.320	(0.031)	0.139	(0.027)	0.541	(0.035)
N	81		35		136	
Examples	South Gate, Gilroy, Fontana, Salinas, Merced		Los Altos Hills, Beverly Hills, Pleasanton, La Canada Flintridge, Burlingame		Pasadena, Oakland, Simi Valley, West Hollywood, Sacramento	

Source: Mawhorter and Reid (2018); U.S. Census Bureau (2010, 2017)

Note: Localities missing two or fewer regulation indicators were given mean values of missing indicators based on their application frequency category. Localities missing more than two of the indicators or information on ADU application frequency (n=34) were excluded from the analysis. Localities with “least” and “most” restrictive regulations are in the top and bottomquartile of the ADU Regulation Index respectively.

racially and ethnically diverse and less advantaged than those that are Prosperous & Moderate. The Diverse & Flexible communities are most likely to have adopted an ADU ordinance (72%) and receive frequent ADU applications (46%). Examples include Pasadena and West Hollywood in Los Angeles County, Simi Valley in Ventura County, and Oakland and Sacramento.

Localities with Adopted Ordinances and Less Restrictive Regulations Had More Frequent ADU Applications

A key finding from this analysis is that localities with adopted ordinances and less restrictive regulations received more frequent applications to build ADUs. Table 7 reports differences in ADU regulations between localities receiving ADU applications monthly and less than monthly. Localities that received ADU applications at least monthly tended to have less restrictive ADU regulations (index of -0.18 vs. 0.11) (see Table 7). Fees were on average one-third less for localities receiving at least monthly applications compared to localities receiving less than monthly applications (\$6,782 vs. \$10,208). In turn, these localities had much lower

parking space requirements (0.94 vs. 1.06 spaces) and minimum lot size ratios (0.79 vs. 0.92).

Two additional observations are notable. First, whether or not the locality had adopted an ADU ordinance did not meaningfully alter these trends. Or to put it another way, having less restrictive ADU regulations was associated with more frequent ADU applications regardless of whether a locality had an adopted ordinance. Second, localities receiving at least monthly applications were much more likely to lack parking space standards (31 vs. 13%); not having standards for the other three kinds of ADU regulation was not statistically associated with ADU application frequency.

Localities receiving more frequent ADU applications had distinct regulatory, capacity, political, demographic, and housing market characteristics (see Table 8). Places with more frequent ADU applications tended to be larger, older, denser, and charter cities governed by ABAG (37 vs. 22%). Staff in these localities were more likely to report that public opposition and parcel features constrained development (68 vs. 54% for the latter). Places receiving more frequent ADU applications also tended to have higher and increasing incomes (median household income of \$83,011 vs. \$74,882; growth of 2 vs. -1%) and have lower proportions of Latinxs (31 vs. 38%), higher proportions of Asians (18 vs. 12%), and lower rates of White population decline (-3 vs. -4%). These places also had higher median housing values (about \$660k vs. \$500k) and lower rates of property value decline during the 2010s in the aftermath of the foreclosure crisis (-4 vs. -12%). Finally, these localities had higher median rents (about \$1.6k vs. \$1.4k) and greater rent increases (8 vs. 5%).

Table 7: ADU Regulations by Application Frequency

Regulations	Localities with Ordinances Adopted		All Localities	
	Applications At Least Monthly	Applications Less than Monthly	Applications At Least Monthly	Applications Less than Monthly
ADU Regulation Index	-0.21**	0.12**	-0.18**	0.11**
Ratio of ADU to SFH Minimum Lot Size				
Mean	0.82*	0.92*	0.79**	0.92**
Lacks Standard (%)	28	19	22	16
Maximum Unit Size (sqft)				
Mean	1,038	1,195	1,084	1,145
Lacks Standard (%)	1	2	1	5
Off Street Parking (spaces)				
Mean	0.94**	1.05**	0.94**	1.06**
Lacks Standard (%)	32**	14**	31**	13**
Fees (\$)				
Mean	\$6,450**	\$10,511**	\$6,782**	\$10,208**
Lacks Standard (%)	8	7	8	7
Total	72	85	90	128

Source: Mawhorter and Reid (2018)

Note: Localities missing two or fewer regulation indicators were given mean values of missing indicators based on their application frequency category. Localities missing more than two of the indicators or information on ADU application frequency (n=34) were excluded from the analysis. **p<0.01, * p<0.05; two-tailed test

Table 8: Local Characteristics Associated with ADU Application Frequency

Characteristics	Mean	Standard Deviation	Number of Obs.	All Localities		Localities with Ordinances Adopted	
				Applications At Least Monthly	Applications Less than Monthly	Applications At Least Monthly	Applications Less than Monthly
				Regulatory & Capacity Opportunities or Constraints			
Single Family Homes Allowed on 50%+ of Local Land (%)	0.69	N/A	251	0.72	0.67	0.74	0.70
Minor or Greater Constraint on Development (%)							
Building Permit Process Length	0.52	N/A	248	0.59	0.47	0.57	0.45
Moderate or Greater Constraint on Development (%)							
Infrastructure Capacity	0.42	N/A	245	0.37	0.45	0.36	0.48
Parcel Configuration, Location, or Size	0.60	N/A	247	0.68*	0.54*	0.67	0.52
Incorporation Year	1926	41	252	1919*	1931*	1920	1931
Political Climate							
Public Opposition is a Moderate or Greater Constraint on Development (%)	0.50	N/A	245	0.57	0.46	0.56*	0.39*
Charter City	0.32	N/A	252	0.42**	0.26**	0.39	0.25
Council of Governments							
ABAG	0.28	N/A	252	0.37*	0.22*	0.39	0.27
SCAG	0.40	N/A	252	0.40	0.40	0.36	0.27
Other	0.32	N/A	252	0.23*	0.38*	0.24**	0.46**
Demographics & Housing Market Conditions (2010 - 2017)							
Population	97,113	279,961	252	143,426	68,178	99,671	72,311
Change (%)	0.06	0.07	252	0.06	0.07	0.07	0.07
Density (Persons per square mile) (2010)	4,545	3,120	252	5,527**	3,933**	5,344**	3,555**
Median Household Income	\$77,744	\$37,032	252	\$83,011	\$74,882	\$86,645*	\$73,191*
Change (%) (in 2017 \$)	0.00	0.12	252	0.02*	-0.01*	0.03**	-0.02**
Race & Ethnicity							
Latinx (%)	0.35	0.24	252	0.31*	0.38*	0.29**	0.39**
Change (% pt)	0.02	0.03	252	0.02	0.02	0.01	0.02
Asian or Pacific Islander (%)	0.14	0.14	252	0.18**	0.12**	0.18*	0.12*
Change (% pt)	0.01	0.03	252	0.01	0.01	0.01	0.01
White (%)	0.43	0.23	252	0.44	0.42	0.46	0.41
Change (% pt)	-0.04	0.04	252	-0.03**	-0.04**	-0.03**	-0.04**
Seniors (%)	0.15	0.06	252	0.15*	0.14*	0.16**	0.13**
Families in Poverty (%)	0.16	0.11	252	0.15	0.17	0.14**	0.18**
Change (% pt)	0.02	0.06	252	0.01	0.02	0.01	0.01
Multigenerational Households (%) (2010)	0.06	0.04	252	0.06	0.07	0.06	0.07
Owner Occupying Single Family Detached Households (%)	0.48	0.15	252	0.46	0.50	0.48	0.49
Second Homes (%)	0.03	0.07	252	0.02	0.03	0.02	0.03
Vacant Homes (%)	0.05	0.03	252	0.05	0.05	0.05	0.05
Median Housing Value	\$562,104	\$403,351	252	\$657,509**	\$501,783**	\$692,139**	\$491,376**
Change (%) (in 2017 \$)	-0.09	0.22	252	-0.04**	-0.12**	-0.02*	-0.12*
Median Rent	\$1,491	\$481	252	\$1,573*	\$1,442*	\$1,602**	\$1,400**
Change (%) (in 2017 \$)	0.06	0.11	251	0.08*	0.05*	0.09**	0.04**
Housing Burden (%)							
Renters	0.52	0.09	252	0.51	0.52	0.51	0.51
Owners	0.32	0.05	252	0.32	0.32	0.32	0.32
Severe Housing Burden (%)							
Renters	0.26	0.06	252	0.26	0.26	0.26	0.25
Owners	0.13	0.04	252	0.14	0.13	0.14	0.13
Total			252	98	149	74	92

Source: Mawhorter and Reid (2018); U.S. Census Bureau (2010, 2017)

Note: Averages calculated using listwise deletion.**p<0.01, * p<0.05; two-tailed test

Localities with adopted ordinances and less restrictive regulations had more frequent ADU applications, after comparing otherwise similar localities (see Table 9). Localities with adopted ordinances were more than twice as likely to have frequent ADU applications than localities without adopted ordinances. Further, moving from the start of the bottom quartile to the start of the top quartile of the ADU Regulation Index (going from 0.35 (moderately restrictive) to -0.36 (moderately less restrictive)) is associated with a 67% increase in the odds of having frequent ADU applications.⁸ Notably, local governance characteristics, such as perceived public opposition to development or regulatory constraints on development, do not mediate the relationship between ADU ordinance status, regulatory restrictiveness, and application frequency.

Two demographic characteristics, the population size and the proportion of seniors, were associated with ADU application frequency. The association with population size is expected, given that large cities should receive more frequent applications than small cities. The association with the proportion of seniors might signify that aging communities exhibit greater demand and public support for ADUs to help meet caretaking needs. About 45% of older localities (>20% seniors) reported receiving frequent ADU applications compared to only 14% of younger localities (<10% seniors).

ADU Application Frequency Was Not Associated with Statistically Significant Increases in Housing Affordability or Aging in Place

Localities with more frequent ADU applications were no more likely to experience improvements in housing affordability or aging in place from 2010 to 2017 (see Tables 10 and 11). This finding is

Table 9: Associations between ADU Application Frequency and ADU Regulations

Characteristics	ADU Applications At Least Monthly			
	Model 1	Model 2	Model 3	Model 4
ADU Regulations				
Regulation Index	0.458** (0.111)	0.535* (0.138)	0.481* (0.145)	0.480* (0.147)
Ordinance Adopted (%)	1.923* (0.575)	2.439** (0.779)	2.602** (0.900)	2.597** (0.918)
Regulatory & Capacity Opportunities or Constraints				
Single Family Homes Allowed on 50%+ of Local Land (%)		1.262 (0.396)		1.267 (0.472)
Minor or Greater Constraint on Development (%)				
Building Permit Process Length		1.462 (0.439)		1.412 (0.470)
Moderate or Greater Constraint on Development (%)				
Infrastructure Capacity		0.563 (0.171)		0.624 (0.217)
Parcel Configuration, Location, or Size		1.481 (0.456)		1.236 (0.449)
Incorporation Year		0.994 (0.004)		0.996 (0.004)
Political Climate				
Public Opposition is a Moderate or Greater Constraint on Development (%)		1.375 (0.432)		0.975 (0.361)
Charter City		1.852 (0.602)		1.025 (0.415)
Council of Governments				
Other		0.473* (0.156)		1.030 (0.478)
SCAG or ABAG (omitted)				
Demographics & Housing Market Conditions (2010 - 2017)				
Population (Ln)			1.947** (0.337)	1.886** (0.369)
Change (%)			1.970 (6.954)	2.901 (10.818)
Density (Persons per square mile) (2010)			1.000* (0.000)	1.000 (0.000)
Median Household Income (Ln)			2.559 (1.824)	2.776 (2.336)
Race & Ethnicity				
Latinx (%)			3.814 (5.484)	2.504 (3.774)
White (%)			1.052 (1.853)	1.318 (2.498)
Seniors (%) (Ln)			23.095** (19.057)	20.198** (17.027)
Multigenerational Households (%) (2010)			0.110 (1.232)	7.470 (89.539)
Owner Occupying Single Family Detached Households (%)			0.213 (0.381)	0.230 (0.449)
Severe Housing Burden (%)				
Renters			28.335 (90.016)	60.157 (194.664)
Owners			0.061 (0.329)	0.136 (0.764)
Constant	0.410** (0.104)	11893.150 (88724.57)	0.000 (0.000)	0.000 (0.006)
N	252	252	252	252
F	7.770	3.290	3.460	2.240
Prob > F	0.000	0.000	0.000	0.001

Source: Mawhorter and Reid (2018); U.S. Census Bureau (2010, 2017)

Note: Localities missing two or fewer regulation indicators were given mean values of missing indicators based on their application frequency category. Localities missing more than two of the indicators or information on ADU application frequency (n=34) were excluded from the analysis. **p<0.01, * p<0.05; two-tailed test

⁸ The logit coefficient is -0.7338554. The difference between -0.3578 and 0.3458 is -0.7036. The change in the log odds is exp(-.7338554*-0.7036)=1.67.

consistent in simple comparisons of average changes in housing conditions between localities with frequent and infrequent ADU applications (Table 10) and more sophisticated models that further isolate these relationships by comparing otherwise similar localities (see Table 11). In fact, the direction of the relationships between ADU application frequency and changes in renter and owner housing affordability in the models is positive, which means that communities with more frequent ADU applications experienced greater increases in housing unaffordability, though this relationship is not statistically significant, meaning there may actually be no relationship. The opposite is true for aging in place—communities with more frequent ADU applications experienced greater increases in seniors aging in place, though this relationship also is not statistically significant.

These results do not definitively mean that ADU applications are unrelated to changes in these housing conditions, since the models do not account for when ADU regulations were established; thus, if increased demand for ADUs were associated with increasing renter and owner housing burdens, that could indicate those conditions were generating demand for ADUs. However, the absence of an affordability-promoting relationship is suggestive that there is not a strong link between ADU demand and improvements in housing affordability. The same is true for the promoting (though also not statistically significant) relationship between ADU demand and aging in place.

Importantly, Table 11 reveals other housing market and local governance conditions that are statistically associated with increases in housing affordability and seniors aging in place. The construction of entirely affordable housing projects has a strong affordability-promoting effect for renters. Localities that constructed at least one entirely affordable project since 2015 typically experienced a decrease of about 1.4% in their proportion of severely housing burdened renters from 2010 to 2017. In turn, the presence of an urban growth boundary has an affordability-promoting effect for owners, with localities with growth boundaries typically experiencing a close to 1% decline in their proportion of severely housing burdened owners.

Some housing market conditions have divergent effects on changes in housing affordability and aging in place. For instance, housing growth has a detracting effect on housing affordability for owners but a promoting effect on aging in place for seniors. Communities with higher proportions of vacation homes and vacancy rates typically experienced increases in housing affordability for renters but decreases in housing affordability for owners. Vacancy rates might signal housing distress, such as foreclosure and negative equity, which might be associated with higher housing costs for owners. In turn, homebuyers may experience greater housing costs in communities with higher concentrations of vacation homes due to competition from wealthier outsiders.

Table 10: Association Between ADU Application Frequency and Change in Housing Conditions

Change in Housing Conditions	Mean	Standard Deviation	Number of Obs.	All Localities		Localities with Ordinances Adopted	
				Applications At Least Monthly	Applications Less than Monthly	Applications At Least Monthly	Applications Less than Monthly
Severe Housing Burden (% pt)							
Renters	0.00	0.07	252	0.00	0.00	0.00	0.00
Owners	-0.05	0.05	252	-0.05	-0.06	-0.05	-0.06
Seniors in Place One Year or More (% pt)	0.00	0.04	252	0.00	0.00	0.01	0.00
Total			252	98	149	74	92

Source: Mawhorter and Reid (2018); U.S. Census Bureau (2010, 2017)

**p<0.01, * p<0.05; two-tailed test

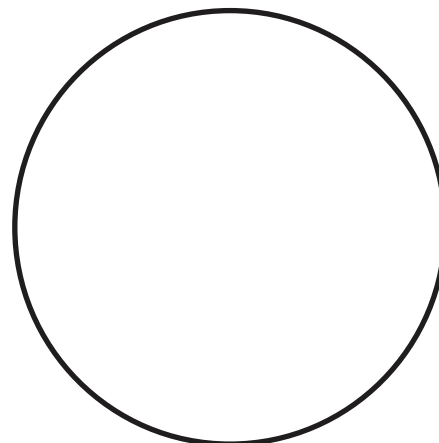
Table 11 also reveals the importance of demand-side factors in accounting for changes in local housing problems. Communities with higher and increasing incomes were more likely to experience decreases in rent burdens than communities with lower or decreasing incomes. In turn, increases in the proportion of families in poverty was strongly associated with increases in housing cost burdens for owners. Finally, the proportion of renters experiencing severe housing burdens had a strong, detracting effect on seniors' propensity to age in place.

Table 11: Associations between ADU Application Frequency and Change in Local Housing Conditions

Characteristics	Change in Housing Conditions		
	Renter Severe Housing Burden	Owner Severe Housing Burden	Seniors Aging in Place
Housing Production			
Applications At Least Monthly (%)			
ADUs	0.007 (0.007)	0.000 (0.004)	0.004 (0.004)
Multifamily Projects	-0.005 (0.010)		
Single-Family Projects		0.002 (0.004)	
Construction of Entirely Affordable Projects Since 2015 (%)	-0.014* (0.007)		
Change in Housing Units (%)	-0.074 (0.053)	0.071* (0.033)	0.094** (0.030)
Regulatory & Capacity Opportunities or Constraints			
Single Family Homes Allowed on > 50% of Local Land (%)		0.005 (0.004)	
Multifamily Homes Allowed on > 25% of Local Land (%)	-0.002 (0.007)		
Off Street Parking Spaces for Three Bedroom Single-Family Home		-0.000 (0.000)	
Resident Parking Spaces for Two Bedroom Multifamily Apartment	-0.012 (0.008)		
Minor or Greater Constraint on Development (%)			
Building Permit Process Length	-0.001 (0.007)	0.008 (0.004)	
Moderate or Greater Constraint on Development (%)			
Infrastructure Capacity	0.018** (0.007)	-0.003 (0.004)	
Parcel Configuration, Location, or Size	0.010 (0.007)	0.003 (0.004)	
Urban Growth Boundary (%)	0.001 (0.007)	-0.009* (0.004)	
Incorporation Year	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
Political Climate			
Public Opposition is a Moderate or Greater Constraint on Development (%)	0.000 (0.007)	0.008 (0.004)	
Charter City	0.008 (0.008)	-0.004 (0.005)	-0.003 (0.004)
Council of Governments			
SCAG or ABAG (omitted)			
Other	-0.017* (0.008)	-0.008 (0.005)	0.001 (0.004)

Characteristics	Change in Housing Conditions		
	Renter Severe Housing Burden	Owner Severe Housing Burden	Seniors Aging in Place
Demographics & Housing Market Conditions (2010 - 2017)			
Population			
Change (%)	0.113 (0.070)	-0.043 (0.042)	-0.085* (0.038)
Density (2010)	0.000 (0.000)	0.000 (0.000)	0.000** (0.000)
Median Household Income (Ln)	-0.043** (0.017)	-0.002 (0.012)	0.013 (0.011)
Change (%) (in 2017 \$)	-0.157** (0.034)	-0.018 (0.021)	-0.025 (0.019)
Race & Ethnicity			
Latinx (%)	0.017 (0.028)	0.031 (0.018)	0.012 (0.015)
White (%)	0.078* (0.037)	0.041 (0.023)	-0.021 (0.020)
Seniors (%) (Ln)	0.009 (0.013)	0.010 (0.008)	-0.000 (0.007)
Change (%) pt)			-0.118 (0.104)
Change in Families in Poverty (%) pt)	0.020 (0.059)	0.110** (0.037)	-0.039 (0.032)
Multigenerational Households (%) (2010)	0.210 (0.228)	0.067 (0.145)	-0.084 (0.127)
Owner Occupying Single Family Detached Households (%)	-0.047 (0.036)	-0.048* (0.022)	0.060** (0.019)
Second Homes (%)	-0.130* (0.053)	0.069* (0.033)	0.013 (0.030)
Vacant Homes (%)	-0.317* (0.127)	0.318** (0.081)	-0.124 (0.073)
Change in Median Rent (%) (in 2017 \$)	-0.034 (0.039)		-0.031 (0.020)
Rent Control Ordinance (%)	0.005 (0.010)		-0.005 (0.005)
Change in Median Housing Value (%) (in 2017 \$)		0.022 (0.015)	0.006 (0.012)
Severe Housing Burden (%) (2010)			
Renters	-0.670** (0.052)		-0.074** (0.027)
Owners		-0.774** (0.051)	
Seniors in Place One Year or More (%) (2010)			-0.735** (0.058)
Constant	0.794** (0.249)	-0.061 (0.158)	0.667** (0.141)
N	252	252	252
F	11.150	16.070	10.840
Prob > F	0.000	0.000	0.000
Adjusted R-Squared (Listwise Deletion Models)	0.515	0.583	0.446

Source: Mawhorter and Reid (2018); U.S. Census Bureau (2010, 2017)
 **p<0.01, * p<0.05; two-tailed test



Policy Implications / Recommendations

There are three takeaways from these findings, which can help guide policy approaches to ADUs. First, there are divergent responses to ADUs in California. What is motivating more disadvantaged communities of color to regulate ADUs more restrictively than more advantaged and predominately White and Asian or racially and ethnically diverse communities is an important subject for further research. One possibility is that more disadvantaged communities of color are already inundated with informal ADUs and struggling to manage their effects on quality of life by imposing stricter regulations (e.g., Wegmann, 2015; Pfeiffer, 2015). In short, these communities might perceive ADUs as a nuisance rather than a tool to help solve housing problems. However, another possibility is that these communities may have misconceptions about what ADUs are or what their effects could be. These two situations warrant different responses, such as efforts to provide technical support to shape regulations to meet local needs in the former kind of community and dispel misconceptions in latter. Overall, the diverse approaches to ADUs in California suggests that there is no common conception of ADUs or one-size-fits-all policy; rather, there is a need to better understand how communities conceive of ADUs and develop tools to help shape regulations to meet local priorities.

Second, passing a formal ADU ordinance with relatively less restrictive regulations, particularly pertaining to off-street parking spaces, eligible lot sizes, and fees, is a sensible strategy for encouraging applications to build ADUs. Adopting an ordinance more than doubled the likelihood of having frequent ADU applications; further, the least restrictive localities were at least 67% more likely to have frequent ADU applications than the most restrictive localities. The findings also suggest that requiring no off-street parking spaces may be a particularly effective way to encourage frequent ADU applications, given that localities receiving frequent applications were much more likely to lack these standards (31 vs. 13%). One way that localities can accomplish this without increasing parking congestion is by establishing Residential Parking Permit Districts, which allocate a limited number of on-street parking permits to cars registered at area homes with ADUs (Brown et al., 2017).

Finally, adopting an ADU ordinance and having less

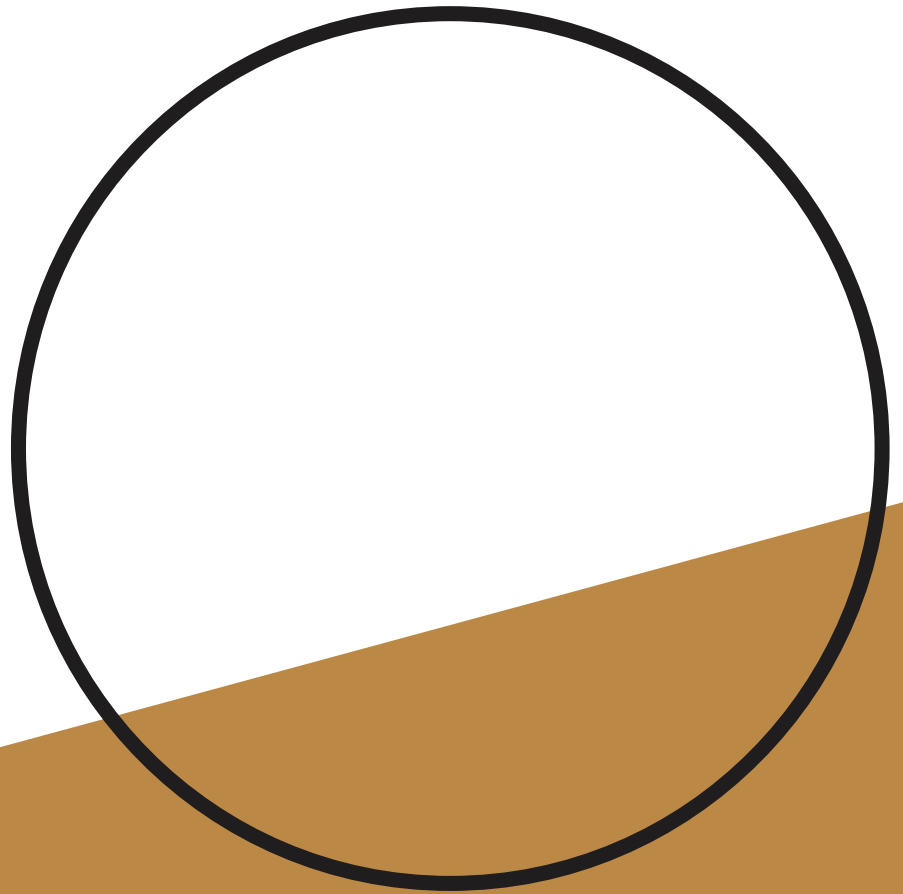
restrictive regulations are not a panacea for solving California's crises of housing affordability and aging in place. There is no evidence yet to suggest that—on their own—more frequent ADU applications are linked to increases in housing affordability or seniors aging in place. These relationships may emerge in the future, given that some localities have only recently begun to implement an ADU strategy. Longitudinal research on this topic is paramount, though the lack of any correlation in the findings suggests the absence of a strong relationship. Localities should look to where evidence between policy and effect is stronger—such as between affordable housing construction and increases in renter housing affordability—in identifying targeted approaches that could be paired with a longer-term ADU strategy.

Conclusion

This research has offered a comprehensive glimpse into the ways that localities in California are regulating ADUs, and how these regulations relate to formal demonstrated demand for constructing ADUs and changes in housing affordability and aging in place. The findings reveal diverse local approaches to ADUs, from a more restrictive approach in communities of color threatened with socioeconomic decline to a less restrictive approach in more racially and ethnically diverse and socioeconomically stable communities grappling with high renter housing unaffordability. Evidence suggests that communities with formal and less restrictive ADU regulations have higher formal demand for and potential production of ADUs, as proxied by receiving more frequent applications to build ADUs. However, there is not yet evidence to suggest that communities that experience higher formal ADU demand are more likely to experience increases in housing affordability or aging in place over time.

The limitations of this analysis—including the lack of comprehensive longitudinal data on ADU practices, which makes it difficult to establish a causal relationship between ADU practices and changes in local housing conditions—make further testing the potential for causal relationships an important direction for future research. Nevertheless, this analysis provides state and local policymakers with near-term steps that could help lay the groundwork for increased ADU production as well as promote better housing affordability and the ability of seniors to age in place in the long run. For instance,

the lack of a common approach to ADUs in California suggests the need for context-specific technical support and advocacy to help align local practices with statewide goals. In turn, ADUs are best perceived as one of many tools available to manage local housing problems. While evidence linking ADU practices to changes in housing affordability and aging in place may emerge as these practices mature, in the interim, localities should pair any ADU strategy with targeted approaches that have been shown to have an appreciable impact in ameliorating specific local housing problems.



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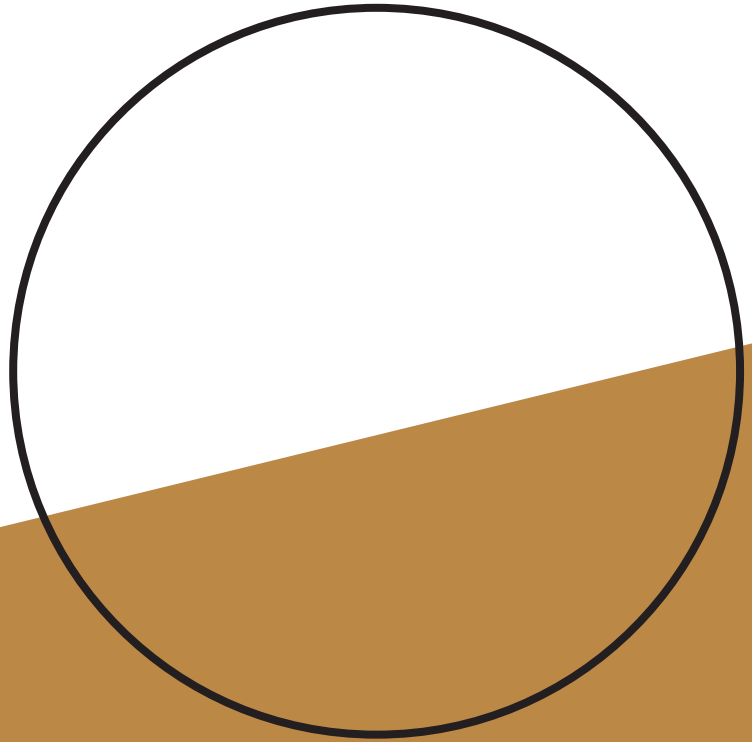
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Biography

Deirdre Pfeiffer is an Associate Professor in the School of Geographical Sciences and Urban Planning at Arizona State University and a member of the American Institute of Certified Planners. Dr. Pfeiffer is a housing planning scholar, with expertise on housing as a cause and effect of growing social inequality and the role of housing planning in meeting the needs of diverse social groups. She holds a MA and PhD in Urban Planning from UCLA.



Appendix 1: ADU Regulation Index

County	City	ADU Ordinance Status	Ratio of ADU to SFH Minimum Lot Size	Maximum Unit Size (sqft)	Off Street Parking (spaces)	Fees (\$)	ADU Regulation Index	Rank	Percentile	Quartile
Los Angeles	Inglewood	In process	No Standard	No Standard	No Standard	No Standard	-2.40	219	100	1
San Francisco	San Francisco	Adopted	No Standard	No Standard	No Standard	No Standard	-2.40	219	100	1
Los Angeles	Lakewood	None	No Standard	No Standard	No Standard	Unknown	-2.10	218	99	1
Shasta	Shasta Lake	Adopted	No Standard	No Standard	1.0	No Standard	-1.87	217	99	1
Humboldt	Arcata	None	No Standard	No Standard	1.0	\$9,000	-1.58	216	98	1
Los Angeles	Pasadena	Adopted	No Standard	No Standard	No Standard	\$25,600	-1.58	215	98	1
Sacramento	Sacramento	Adopted	No Standard	1200	No Standard	\$291	-1.08	214	97	1
Los Angeles	Bellflower	Adopted	0.71	No Standard	1.0	\$11,483	-1.07	213	97	1
San Mateo	Brisbane	Adopted	No Standard	1000	No Standard	\$300	-1.06	212	96	1
Placer	Roseville	Adopted	No Standard	700	No Standard	No Standard	-1.03	211	96	1
Los Angeles	Sierra Madre	Adopted	No Standard	1200	No Standard	\$2,174	-1.02	210	95	1
San Mateo	San Bruno	Adopted	No Standard	640	No Standard	\$925	-1.00	209	95	1
Alameda	Albany	Adopted	No Standard	650	No Standard	\$1,123	-0.99	208	95	1
Contra Costa	Oakley	Adopted	Unknown	No Standard	1.0	\$12,803	-0.98	207	94	1
Los Angeles	Redondo Beach	In process	0.03	1200	No Standard	\$3,000	-0.98	206	94	1
Mono	Mammoth Lakes	Adopted	No Standard	1200	No Standard	\$4,000	-0.97	205	93	1
Riverside	Beaumont	Adopted	No Standard	Unknown	No Standard	Unknown	-0.88	204	93	1
Alameda	Berkeley	Adopted	No Standard	750	No Standard	Unknown	-0.84	203	92	1
Alameda	Alameda	Adopted	No Standard	1200	No Standard	\$9,000	-0.81	202	92	1
San Mateo	Redwood City	Adopted	No Standard	900	No Standard	\$8,000	-0.80	201	91	1
Marin	Ross	Adopted	No Standard	1200	0.5	\$994	-0.80	200	91	1
Butte	Chico	Adopted	No Standard	1200	No Standard	Unknown	-0.79	197	90	1
Sacramento	Citrus Heights	Adopted	No Standard	1200	No Standard	Unknown	-0.79	197	90	1
Santa Clara	Santa Clara	Adopted	No Standard	1200	No Standard	Unknown	-0.79	197	90	1
San Mateo	Millbrae	None	1.00	5000	No Standard	Unknown	-0.75	196	89	1
Santa Barbara	Santa Barbara	Adopted	Unknown	1300	No Standard	\$200	-0.73	195	89	1
Imperial	El Centro	In process	Unknown	1200	No Standard	\$181	-0.71	194	88	1
Mendocino	Fort Bragg	Adopted	Unknown	Unknown	No Standard	No Standard	-0.71	193	88	1
Sonoma	Sebastopol	Adopted	No Standard	840	No Standard	\$11,000	-0.70	192	87	1
Contra Costa	El Cerrito	Adopted	Unknown	Unknown	No Standard	\$568	-0.69	191	87	1
Napa	Napa	Adopted	No Standard	1200	0.5	\$8,000	-0.57	190	86	1
Fresno	Sanger	Adopted	No Standard	1200	1.0	No Standard	-0.57	188	85	1
Ventura	Simi Valley	Adopted	No Standard	1200	1.0	No Standard	-0.57	188	85	1
Ventura	Santa Paula	In process	No Standard	Unknown	1.0	No Standard	-0.55	187	85	1
Orange	San Juan Capistrano	Adopted	No Standard	1000	1.0	No Standard	-0.54	186	85	1
Orange	Fountain Valley	In process	Unknown	1200	No Standard	Unknown	-0.52	184	84	1
San Bernardino	Apple Valley	Adopted	Unknown	1200	No Standard	Unknown	-0.52	184	84	1
Riverside	Indian Wells	None	2.59	No Standard	No Standard	Unknown	-0.52	183	83	1
Napa	American Canyon	Adopted	Unknown	1200	No Standard	\$3,000	-0.52	182	83	1
San Diego	Oceanside	Adopted	No Standard	1200	0.5	\$10,000	-0.51	181	82	1
Siskiyou	Weed	Adopted	1.00	1400	No Standard	\$150	-0.50	180	82	1
Fresno	Kerman	Adopted	No Standard	1200	1.0	\$2,237	-0.50	179	81	1
San Mateo	Belmont	Adopted	0.83	1200	No Standard	\$3,000	-0.49	178	81	1
Solano	Dixon	Adopted	No Standard	1200	1.0	\$2,500	-0.49	177	80	1
Los Angeles	Bradbury	None	0.09	1200	1.0	\$1,082	-0.48	176	80	1
Alameda	Oakland	Adopted	Unknown	800	No Standard	Unknown	-0.47	175	80	1
Alameda	Emeryville	In process	1.00	1200	No Standard	\$410	-0.47	174	79	1
Contra Costa	San Pablo	Adopted	1.00	1200	No Standard	\$419	-0.47	173	79	1

County	City	ADU Ordinance Status	Ratio of ADU to SFH Minimum Lot Size	Maximum Unit Size (sqft)	Off Street Parking (spaces)	Fees (\$)	ADU Regulation Index	Rank	Percentile	Quartile
Monterey	Pacific Grove	Adopted	1.00	1200	No Standard	\$450	-0.47	172	78	1
Los Angeles	Los Angeles	In process	Unknown	1200	0.5	No Standard	-0.46	171	78	1
San Mateo	Colma	Adopted	1.00	800	No Standard	\$280	-0.43	170	77	1
Los Angeles	Manhattan Beach	Adopted	1.00	500	No Standard	\$500	-0.38	169	77	1
San Mateo	Daly City	Adopted	Unknown	1500	Unknown	\$614	-0.38	168	76	1
Los Angeles	West Hollywood	In process	0.10	1000	1.0	\$3,500	-0.37	167	76	1
San Mateo	Atherton	Adopted	No Standard	1200	1.0	Unknown	-0.37	166	75	1
Marin	San Anselmo	Adopted	Unknown	1200	Unknown	No Standard	-0.37	165	75	1
Sonoma	Healdsburg	Adopted	Unknown	850	No Standard	\$10,000	-0.36	164	75	1
Solano	Vallejo	In process	0.90	1200	No Standard	Unknown	-0.35	163	74	2
Santa Clara	Cupertino	Adopted	No Standard	1000	1.0	Unknown	-0.34	161	73	2
Contra Costa	Danville	Adopted	No Standard	1000	1.0	Unknown	-0.34	161	73	2
San Bernardino	Hesperia	Adopted	0.40	3000	1.0	Unknown	-0.34	160	73	2
Napa	Calistoga	Adopted	No Standard	750	No Standard	\$22,000	-0.34	159	72	2
Orange	Santa Ana	In process	Unknown	1200	Unknown	\$2,163	-0.30	158	72	2
Alameda	San Leandro	Adopted	Unknown	1200	Unknown	\$2,466	-0.29	157	71	2
San Mateo	Hillsborough	Adopted	No Standard	1400	1.0	Unknown	-0.29	156	71	2
Los Angeles	West Covina	Adopted	Unknown	800	0.5	\$1,000	-0.27	155	70	2
Los Angeles	Lomita	Adopted	Unknown	1200	Unknown	\$3,100	-0.27	154	70	2
Sonoma	Rohnert Park	Adopted	No Standard	1200	1.0	Unknown	-0.26	152	69	2
Nevada	Truckee	Adopted	No Standard	1200	1.0	Unknown	-0.26	152	69	2
Santa Clara	Palo Alto	Adopted	0.83	900	No Standard	\$10,000	-0.23	151	69	2
San Mateo	South San Francisco	Adopted	Unknown	900	0.5	Unknown	-0.22	150	68	2
Los Angeles	La Canada Flintridge	Adopted	0.25	1200	1.0	Unknown	-0.22	149	68	2
Imperial	Imperial	None	1.00	1200	No Standard	\$9,000	-0.20	148	67	2
Los Angeles	Rolling Hills Estates	In process	0.50	750	1.0	\$500	-0.19	147	67	2
Los Angeles	Temple City	Adopted	Unknown	1200	1.0	\$256	-0.18	146	66	2
Nevada	Grass Valley	Adopted	No Standard	1200	1.0	\$12,000	-0.18	145	66	2
Los Angeles	Arcadia	Adopted	Unknown	1200	1.0	\$450	-0.18	144	65	2
Los Angeles	Downey	Adopted	1.00	850	No Standard	Unknown	-0.14	143	65	2
Los Angeles	Westlake Village	In process	Unknown	1200	Unknown	\$50	-0.12	142	65	2
San Luis Obispo	San Luis Obispo	Adopted	0.83	450	No Standard	\$12,000	-0.11	141	64	2
Alameda	Livermore	Adopted	Unknown	640	1.0	\$510	-0.11	140	64	2
San Mateo	Half Moon Bay	In process	Unknown	700	1.0	\$1,072	-0.10	139	63	2
Ventura	Moorpark	Adopted	Unknown	1200	1.0	\$100	-0.08	138	63	2
Siskiyou	Mount Shasta	Adopted	Unknown	1200	1.0	\$230	-0.08	137	62	2
Los Angeles	El Monte	Adopted	1.00	800	Unknown	\$341	-0.07	136	62	2
Contra Costa	Clayton	In process	Unknown	1200	1.0	\$500	-0.07	135	61	2
San Joaquin	Lathrop	Adopted	0.83	1200	1.0	No Standard	-0.06	134	61	2
Los Angeles	Beverly Hills	Adopted	0.80	1200	Unknown	Unknown	-0.06	133	60	2
Sacramento	Rancho Cordova	Adopted	Unknown	1200	1.0	\$967	-0.06	132	60	2
Riverside	San Jacinto	In process	0.69	1200	1.0	\$3,000	-0.05	131	60	2
Contra Costa	Richmond	In process	1.00	800	Unknown	\$1,200	-0.05	130	59	2
Ventura	Camarillo	Adopted	0.71	640	1.0	\$723	-0.04	129	59	2
Riverside	Desert Hot Springs	Adopted	No Standard	1200	2.0	No Standard	-0.04	128	58	2
Santa Clara	Mountain View	Adopted	No Standard	700	1.0	\$15,000	-0.03	127	58	2
Riverside	Palm Springs	Adopted	0.58	1200	1.0	Unknown	-0.02	126	57	2
Marin	Mill Valley	Adopted	0.83	1000	Unknown	Unknown	-0.01	125	57	2
Los Angeles	San Gabriel	In process	0.83	800	1.0	\$335	0.00	124	56	2
Santa Clara	Milpitas	Adopted	Unknown	475	1.0	\$38	0.00	123	56	2
San Diego	La Mesa	In process	Unknown	1200	1.0	Unknown	0.01	116	53	2
Yolo	Davis	Adopted	Unknown	1200	1.0	Unknown	0.01	116	53	2
San Diego	National City	Adopted	Unknown	1200	1.0	Unknown	0.01	116	53	2
San Mateo	Pacifica	Adopted	Unknown	1200	1.0	Unknown	0.01	116	53	2

County	City	ADU Ordinance Status	Ratio of ADU to SFH Minimum Lot Size	Maximum Unit Size (sqft)	Off Street Parking (spaces)	Fees (\$)	ADU Regulation Index	Rank	Percentile	Quartile
Napa	Saint Helena	Adopted	Unknown	1200	1.0	Unknown	0.01	116	53	2
Contra Costa	San Ramon	Adopted	Unknown	1200	1.0	Unknown	0.01	116	53	2
San Diego	Solana Beach	Adopted	Unknown	1200	1.0	Unknown	0.01	116	53	2
Inyo	Bishop	Adopted	1.00	1500	1.0	No Standard	0.01	115	52	2
San Diego	Chula Vista	In process	Unknown	1200	1.0	\$6,300	0.01	114	52	2
Los Angeles	Whittier	Adopted	0.95	150	Unknown	\$1,850	0.02	113	51	2
Los Angeles	Glendale	Adopted	Unknown	500	1.0	\$4,700	0.04	112	51	2
Orange	Yorba Linda	Adopted	1.00	1200	1.0	\$108	0.05	111	50	2
San Diego	El Cajon	Adopted	1.00	1200	1.0	\$700	0.06	110	50	2
Orange	Stanton	In process	Unknown	700	1.0	Unknown	0.07	109	50	2
Riverside	Menifee	Adopted	1.00	1800	1.0	\$3,150	0.07	108	49	3
Orange	Laguna Hills	Adopted	Unknown	1200	1.0	\$5,000	0.07	107	49	3
Tulare	Dinuba	Adopted	1.00	1200	0.5	Unknown	0.08	106	48	3
Solano	Benicia	In process	1.00	800	1.0	\$175	0.10	105	48	3
Santa Cruz	Watsonville	In process	1.00	750	1.0	\$120	0.10	104	47	3
San Bernardino	Montclair	In process	1.00	700	1.0	No Standard	0.10	103	47	3
Los Angeles	Pico Rivera	Adopted	0.92	500	1.0	\$1,100	0.12	102	46	3
Orange	Buena Park	Adopted	1.00	600	1.0	\$200	0.12	101	46	3
Orange	Fullerton	Adopted	Unknown	1200	1.0	\$10,000	0.13	100	45	3
Santa Clara	Los Altos Hills	Adopted	1.00	1000	1.0	\$2,476	0.15	99	45	3
Orange	Anaheim	Adopted	0.69	1200	1.0	Unknown	0.16	98	45	3
Sacramento	Elk Grove	Adopted	0.71	1200	1.0	Unknown	0.17	97	44	3
Contra Costa	Pinole	Adopted	0.83	999	0.5	\$15,000	0.18	96	44	3
San Diego	Del Mar	Adopted	1.00	550	Unknown	\$3,500	0.20	95	43	3
Orange	Westminster	Adopted	1.00	800	No Standard	\$20,000	0.20	94	43	3
Los Angeles	Norwalk	Adopted	2.00	720	No Standard	\$720	0.20	93	42	3
Los Angeles	Monrovia	Adopted	Unknown	1250	1.0	Unknown	0.21	92	42	3
Santa Clara	Los Altos	In process	Unknown	1200	1.0	Unknown	0.22	83	38	3
Shasta	Anderson	Adopted	Unknown	1200	1.0	Unknown	0.22	83	38	3
Orange	La Habra	Adopted	Unknown	1200	1.0	Unknown	0.22	83	38	3
Riverside	La Quinta	Adopted	Unknown	1200	1.0	Unknown	0.22	83	38	3
Merced	Merced	Adopted	Unknown	1200	1.0	Unknown	0.22	83	38	3
Riverside	Palm Desert	Adopted	Unknown	1200	1.0	Unknown	0.22	83	38	3
Alameda	Pleasanton	Adopted	Unknown	1200	1.0	Unknown	0.22	83	38	3
San Diego	San Diego	Adopted	Unknown	1200	1.0	Unknown	0.22	83	38	3
Los Angeles	Torrance	Adopted	Unknown	1200	1.0	Unknown	0.22	83	38	3
Los Angeles	Lancaster	Adopted	1.00	700	1.0	\$4,000	0.23	82	37	3
Alameda	Dublin	Adopted	No Standard	1200	1.0	\$25,000	0.23	81	37	3
Alameda	Union City	Adopted	Unknown	800	1.0	\$8,624	0.24	80	36	3
Riverside	Coachella	Adopted	0.76	800	1.0	\$9,100	0.24	79	36	3
Santa Clara	Monte Sereno	Adopted	1.00	1200	1.0	Unknown	0.24	78	35	3
Los Angeles	Baldwin Park	In process	Unknown	1000	1.0	Unknown	0.24	76	35	3
San Luis Obispo	Grover Beach	In process	Unknown	1000	1.0	Unknown	0.24	76	35	3
Los Angeles	Duarte	Adopted	0.92	700	1.0	Unknown	0.25	75	34	3
San Bernardino	Ontario	Adopted	Unknown	850	1.0	Unknown	0.26	74	34	3
San Mateo	Burlingame	Adopted	1.20	640	1.0	\$1,218	0.27	73	33	3
Yolo	Woodland	Adopted	1.20	1200	No Standard	\$20,000	0.28	72	33	3
Yolo	West Sacramento	Adopted	Unknown	700	1.0	Unknown	0.28	71	32	3
Humboldt	Eureka	None	Unknown	640	1.0	Unknown	0.28	70	32	3
Santa Clara	San Jose	Adopted	1.00	800	1.0	Unknown	0.29	68	31	3
Los Angeles	South El Monte	Adopted	1.00	800	1.0	Unknown	0.29	68	31	3
Los Angeles	Rancho Palos Verdes	None	0.40	1200	2.0	\$3,000	0.30	67	30	3
San Bernardino	Rancho Cucamonga	Adopted	1.39	950	1.0	No Standard	0.31	66	30	3
Los Angeles	Culver City	Adopted	1.00	600	1.0	Unknown	0.31	65	30	3

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Los Angeles	Long Beach	In process	1.00	1000	1.0	\$8,000	0.32	64	29	3
Riverside	Moreno Valley	In process	1.00	1250	1.0	Unknown	0.34	62	28	3
Sutter	Yuba City	Adopted	1.00	1250	1.0	Unknown	0.34	62	28	3
Los Angeles	Bell	In process	1.00	1200	1.0	Unknown	0.35	53	24	4
Los Angeles	Carson	In process	1.00	1200	1.0	Unknown	0.35	53	24	4
Orange	Placentia	In process	1.00	1200	1.0	Unknown	0.35	53	24	4
Orange	La Palma	None	1.00	1200	1.0	Unknown	0.35	53	24	4
Merced	Livingston	Adopted	1.00	1200	1.0	Unknown	0.35	53	24	4
Monterey	Monterey	Adopted	1.00	1200	1.0	Unknown	0.35	53	24	4
Kern	Ridgecrest	Adopted	1.00	1200	1.0	Unknown	0.35	53	24	4
San Joaquin	Stockton	Adopted	1.00	1200	1.0	Unknown	0.35	53	24	4
Lassen	Susanville	Adopted	1.00	1200	1.0	Unknown	0.35	53	24	4
Santa Cruz	Santa Cruz	Adopted	Unknown	1200	1.0	\$17,000	0.35	52	24	4
Riverside	Riverside	In process	1.00	Unknown	1.0	Unknown	0.36	50	23	4
Orange	Cypress	None	1.00	Unknown	1.0	Unknown	0.36	50	23	4
Fresno	Kingsburg	None	1.00	1200	1.0	\$10,000	0.36	48	22	4
Tulare	Visalia	Adopted	1.00	1200	1.0	\$10,000	0.36	48	22	4
Fresno	Firebaugh	Adopted	1.00	1200	1.0	\$10,584	0.38	47	21	4
San Bernardino	Yucaipa	Adopted	Unknown	1200	1.0	\$15,000	0.39	46	21	4
Ventura	Port Hueneme	Adopted	1.00	640	1.0	Unknown	0.41	44	20	4
Los Angeles	Santa Fe Springs	Adopted	1.00	640	1.0	Unknown	0.41	44	20	4
Santa Clara	Gilroy	In process	1.00	600	1.0	Unknown	0.42	43	20	4
Los Angeles	South Gate	Adopted	1.20	640	1.0	Unknown	0.43	42	19	4
Orange	Laguna Beach	In process	1.00	640	1.0	\$10,000	0.43	41	19	4
Los Angeles	Paramount	In process	1.00	500	1.0	Unknown	0.43	40	18	4
Marin	Novato	Adopted	1.00	875	1.0	\$11,000	0.43	39	18	4
San Luis Obispo	Arroyo Grande	In process	0.94	850	1.5	\$4,000	0.44	38	17	4
Stanislaus	Turlock	In process	Unknown	Unknown	1.0	\$16,000	0.44	37	17	4
Tulare	Farmersville	Adopted	1.00	1200	1.0	\$12,543	0.44	36	16	4
Sacramento	Galt	Adopted	1.18	1200	1.0	Unknown	0.46	35	16	4
Los Angeles	Santa Clarita	In process	0.90	1200	1.0	\$15,000	0.46	34	15	4
San Diego	Vista	Adopted	1.00	1000	1.0	\$15,000	0.55	33	15	4
San Bernardino	Fontana	In process	Unknown	1200	1.0	\$20,000	0.55	32	15	4
Solano	Fairfield	Adopted	1.00	1200	1.0	\$16,000	0.55	31	14	4
Orange	Garden Grove	Adopted	1.44	800	1.0	Unknown	0.56	30	14	4
Lake	Lakeport	None	1.33	Unknown	1.0	Unknown	0.56	29	13	4
San Diego	Escondido	Adopted	1.33	1000	1.0	Unknown	0.57	28	13	4
Contra Costa	Concord	Adopted	1.00	1700	1.0	\$19,000	0.59	27	12	4
Orange	Tustin	Adopted	1.39	Unknown	1.0	Unknown	0.60	26	12	4
Sonoma	Santa Rosa	In process	Unknown	1200	1.0	\$25,000	0.61	25	11	4
Alameda	Hayward	In process	1.00	1200	1.5	Unknown	0.61	24	11	4
San Joaquin	Manteca	None	1.00	1200	1.0	\$18,000	0.62	23	10	4
Tulare	Lindsay	Adopted	1.00	800	2.0	\$800	0.64	22	10	4
San Bernardino	Chino	In process	0.63	850	1.0	\$25,000	0.66	21	10	4
Orange	Laguna Niguel	None	0.67	1200	2.0	Unknown	0.67	20	9	4
Monterey	Salinas	Adopted	0.65	1200	Unknown	\$28,000	0.69	19	9	4
Fresno	Reedley	Adopted	1.00	Unknown	1.0	\$20,000	0.70	18	8	4
Monterey	Seaside	Adopted	1.60	Unknown	1.0	Unknown	0.72	17	8	4
Monterey	Soledad	Adopted	1.00	650	1.0	\$20,000	0.75	16	7	4
Santa Clara	Los Gatos	Adopted	Unknown	900	2.0	Unknown	0.78	15	7	4
Orange	Mission Viejo	In process	1.80	1200	1.0	Unknown	0.83	14	6	4
Stanislaus	Riverbank	Adopted	1.00	1200	1.0	\$25,000	0.84	13	6	4
Contra Costa	Pittsburg	Adopted	0.80	1200	1.0	\$30,000	0.88	12	5	4
Alameda	Newark	Adopted	1.00	600	1.0	\$24,500	0.90	11	5	4

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San Bernardino	Twentynine Palms	Adopted	1.00	760	2.0	Unknown	0.93	10	5	4
Siskiyou	Yreka	In process	1.14	1200	2.0	Unknown	0.96	9	4	4
Contra Costa	Moraga	In process	1.00	750	1.0	\$30,236	1.06	8	4	4
Stanislaus	Modesto	Adopted	1.00	640	1.0	\$30,000	1.07	7	3	4
Merced	Los Banos	Adopted	1.00	1200	1.5	\$25,000	1.11	6	3	4
Contra Costa	Walnut Creek	In process	Unknown	950	1.0	\$40,000	1.12	5	2	4
Monterey	Gonzales	In process	1.00	Unknown	1.0	\$35,000	1.18	4	2	4
Contra Costa	Brentwood	Adopted	Unknown	1200	1.0	\$42,930	1.29	3	1	4
Contra Costa	Antioch	Adopted	Unknown	Unknown	2.0	\$30,000	1.41	2	1	4
San Luis Obispo	Atascadero	Adopted	No Standard	1200	2.0	\$50,000	1.56	1	0	4
Marin	San Rafael	In process	Unknown	Unknown	Unknown	\$300	N/A	N/A	N/A	N/A
Los Angeles	Avalon	In process	No Standard	420	No Standard	\$18,300	N/A	N/A	N/A	N/A
Santa Barbara	Santa Maria	In process	No Standard	420	No Standard	\$18,300	N/A	N/A	N/A	N/A
Sacramento	Isleton	None	No Standard	420	No Standard	\$18,300	N/A	N/A	N/A	N/A
San Diego	Encinitas	In process	Unknown	Unknown	1.0	Unknown	N/A	N/A	N/A	N/A
San Diego	Carlsbad	Adopted	Unknown	Unknown	1.0	Unknown	N/A	N/A	N/A	N/A
Los Angeles	Covina	In process	Unknown	Unknown	1.0	Unknown	N/A	N/A	N/A	N/A
San Luis Obispo	Paso Robles	Adopted	Unknown	Unknown	2.0	Unknown	N/A	N/A	N/A	N/A
Amador	Jackson	None	Unknown	Unknown	2.0	Unknown	N/A	N/A	N/A	N/A
San Bernardino	Loma Linda	In process	Unknown	650	Unknown	Unknown	N/A	N/A	N/A	N/A
Monterey	Marina	Adopted	Unknown	950	Unknown	Unknown	N/A	N/A	N/A	N/A
Sonoma	Cloverdale	Adopted	Unknown	1000	Unknown	Unknown	N/A	N/A	N/A	N/A
Orange	Huntington Beach	None	Unknown	1200	Unknown	Unknown	N/A	N/A	N/A	N/A
San Diego	Imperial Beach	None	Unknown	1200	Unknown	Unknown	N/A	N/A	N/A	N/A
San Bernardino	Colton	Adopted	Unknown	1200	Unknown	Unknown	N/A	N/A	N/A	N/A
Riverside	Corona	Adopted	Unknown	1200	Unknown	Unknown	N/A	N/A	N/A	N/A
Kern	Bakersfield	None	1.00	Unknown	Unknown	Unknown	N/A	N/A	N/A	N/A
Tehama	Tehama	None	1.00	Unknown	Unknown	Unknown	N/A	N/A	N/A	N/A
Kings	Avenal	Adopted	1.00	Unknown	Unknown	Unknown	N/A	N/A	N/A	N/A
Santa Cruz	Capitola	Adopted	1.00	Unknown	Unknown	Unknown	N/A	N/A	N/A	N/A
Orange	Rancho Santa Margarita	In process	1.33	Unknown	Unknown	Unknown	N/A	N/A	N/A	N/A
Los Angeles	Rosemead	In process	Unknown	Unknown	Unknown	Unknown	N/A	N/A	N/A	N/A
San Bernardino	San Bernardino	In process	Unknown	Unknown	Unknown	Unknown	N/A	N/A	N/A	N/A
Orange	Costa Mesa	In process	Unknown	Unknown	Unknown	Unknown	N/A	N/A	N/A	N/A
Marin	Fairfax	In process	Unknown	Unknown	Unknown	Unknown	N/A	N/A	N/A	N/A
Orange	Irvine	In process	Unknown	Unknown	Unknown	Unknown	N/A	N/A	N/A	N/A
Riverside	Blythe	None	Unknown	Unknown	Unknown	Unknown	N/A	N/A	N/A	N/A
Ventura	Fillmore	None	Unknown	Unknown	Unknown	Unknown	N/A	N/A	N/A	N/A
Riverside	Lake Elsinore	None	Unknown	Unknown	Unknown	Unknown	N/A	N/A	N/A	N/A
Amador	Plymouth	None	Unknown	Unknown	Unknown	Unknown	N/A	N/A	N/A	N/A
San Bernardino	Victorville	None	Unknown	Unknown	Unknown	Unknown	N/A	N/A	N/A	N/A
Tehama	Red Bluff	Adopted	Unknown	Unknown	Unknown	Unknown	N/A	N/A	N/A	N/A

Source: Mawhorter and Reid (2018)

Note: Localities missing one or two regulation indicators were given mean values of missing indicators based on their application frequency category. Localities missing more than two of the indicators were excluded from the analysis. Localities without standards for an indicator were given zero values for all indicators maximum unit size, for which a value of 12,000 was given.



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