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UNIVERSITY OF CALIFORNIA

Los Angeles

Is Granny in that Flat?:
How Regulations Shape the Construction
and Use of Accessory Dwelling Units
in Los Angeles

A dissertation submitted in partial satisfaction of the
requirements for the degree
Doctor of Philosophy in Urban Planning

by

Rebecca Elisabeth Crane

2020

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2020

ABSTRACT OF THE DISSERTATION

Is Granny in that Flat?:

How Regulations Shape the Construction and Use
of Accessory Dwelling Units in Los Angeles

by

Rebecca Elisabeth Crane

Doctor of Philosophy in Urban Planning

University of California, Los Angeles, 2020

Professor Paavo Monkkonen, Chair

To address the state’s housing shortage, California legislators adopted laws effective 2017 to ease regulations on the construction of accessory dwelling units (ADUs)—small, secondary housing units on lots zoned for single-family homes. In the two years following the change in state law, the City of Los Angeles permitted over 6,000 ADUs, almost ten times what was permitted in the *decade* prior. In fact, ADUs represented half of all housing units permitted in the City of LA in 2018. With around a half million single-family parcels in Los Angeles, ADUs showed potential to significantly increase the city’s housing supply. If ADUs are like other rental properties, the increase in supply might help stabilize housing prices and increase affordability. However, ADUs are unlike other rental properties in three important ways: first, not all homeowners use the new units as housing; second, homeowners may be more discriminating in choosing their tenant than absentee landlords, potentially excluding all

strangers; and third, if homeowners are motivated by financial need, then using the ADU as a short-term rental is more flexible and potentially more profitable than using it as a long-term rental. This dissertation explores the effect of the 2017 ADU legislation on housing supply, focusing on three interrelated components: 1) methods to enumerate unpermitted ADUs, which limit the number of single family parcels available for future ADUs; 2) what neighborhood level characteristics potentially drive permitting, and whether and how the regulatory change affected what types of neighborhoods have seen the most growth in permits; and 3) how homeowners are using ADUs. I answer these questions using data from the Los Angeles County Office of the Assessor, the Census, the City of Los Angeles Department of Building and Safety (LADBS), and an original survey of homeowners who pulled a permit for an ADU. I find that ADUs have increased the supply of relatively low-cost rental units in low-density neighborhoods, but their potential impact is capped both by the absolute number of parcels where ADUs are allowed and also by the number of homeowners willing to sacrifice their privacy and control over their backyards to use the additional unit as housing if not financially necessary.

The dissertation of Rebecca Elisabeth Crane is approved.

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2020

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List of Acronyms

ADU(s)	Accessory Dwelling Unit(s)
SFR	Single-Family Residential

Acknowledgments

Thank you to the members of my dissertation committee, Paavo Monkkonen, Randy Crane, Vinit Mukhija, and Helga Leitner, for your feedback and support on this project.

This dissertation was made possible with support from the John Randolph Haynes and Dora Haynes Foundation Haynes Lindley Doctoral Dissertation Fellowship, the UCLA Dissertation Year Fellowship, and the Ziman Center for Real Estate.

I am lucky to have many wonderful friends and colleagues at UCLA. Thank you to my recurring study session and brainstorming partners Andre Comandon, Silvia Gonzalez, and Xavier Kuai, as well as to the larger network of students and alumni who gave me support, including C.J. Gabbe, Bo Liu, Lisa Berglund, Hugo Sarmiento, Emily Erickson, and Kenton Card. Thank you to the fellow members of the Doctoral Students Planning Committee who worked with me to make the doctoral program supportive and collaborative for all UCLA Urban Planning Doctoral Students. And a special thanks to the members of my cohort for your thoughtfulness and insight, especially during those first years in the program: Fernanda Jahn Verri, Sean Kennedy, Aujean Lee, Kim Steele, and Anne Brown.

I have benefitted immensely from the support of family and friends. To my parents, Marion and John Crane, my siblings, Porter and Mike Figg and Andrew and Tina Crane, and my in-laws, Dea Vazquez and Dea Torres, and to my friends Diana Duarte, Elizabeth Kotzen, Kevin Narag, Gretchen Craig, and Calliope Porter: thank you for being cheerleaders, sounding boards, and mentors over the years.

Finally, thank you to my husband, Ricardo Vazquez, for everything you are. My life is better with you in it.

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Introduction

California is facing a housing shortage. Housing development across the state has not kept pace with population growth. Housing production from 2007 and 2017 averaged 80,000 units per year, an estimated 100,000 units fewer than needed to meet population growth (California Department of Housing and Community Development, 2017). The Southern California Association of Governments estimates Los Angeles currently needs over 320,000 housing units, and it will another 130,000 in the next fifteen years¹. Without sufficient housing, prices have become unaffordable for many residents. In Los Angeles, the median gross monthly rental price for a one-bedroom apartment in many parts of Los Angeles is close to \$2,000—over 50 percent of the average renter’s household income (ACS, 2018).

To contend with demand for more housing, California legislators changed housing regulations as of 2017 to enable more homeowners to permit accessory dwelling units (ADUs) on single-family or multi-family parcels with one other residence across the state. ADUs are secondary housing units on lots that have a larger, primary single-family residence. They are also frequently referred to as granny flats, in-law apartments, secondary units, basement apartments, and garage apartments. These units can be constructed as part of a primary residence, like in the attic or basement, as a separate residence that is attached to the primary residence, or as a separate residence that is detached from the primary residence. Whatever form the unit takes, it must include a bathroom, a kitchen, and a separate entrance to be considered a separate housing unit.

¹ Southern California Association of Governments, Final RHNA Methodology Estimate Tool, Updated 03/05/2020. <http://www.scag.ca.gov/programs/Documents/RHNA/SCAG-Final-RHNA-Methodology-Estimate-Tool-030520.xlsx>

The 2017 policy change has the potential to enable low-density neighborhoods to double their unit density without significantly changing the architectural character of the neighborhood, subsequently avoiding a direct challenge to any firmly entrenched “not in my backyard” (NIMBY) mentality held by local homeowners (Anacker & Niedt, 2019; Liebig et al., 2006). Increasing the population density of a neighborhood, even through the low-scale addition of ADUs, gives rise to fears about increased traffic and parking congestion and incursions of privacy (Liebig et al., 2006). And in order to maintain high home values in their neighborhood, affluent homeowners limit new housing development (Monkkonen & Manville, 2019). But ADUs, limited to a 1,200 sq. ft. unit on the property, do relatively little to alter a low-density home design in a neighborhood.

With around half a million single-family homes in the City of Los Angeles, this legislation has the potential to dramatically increase housing in the city. Even after accounting for the estimated 50,000 to 200,000 unpermitted units already present in Los Angeles (Brown et al., 2017; Mukhija, 2014), at least a quarter of a million parcels could potentially hold a second housing unit. Research suggests that easing regulations on housing construction increases housing supply, which should stabilize housing prices and increase affordability (Glaeser et al., 2008; Glaeser & Gyourko, 2008). And the regulatory changes did lead to a significant increase in permits for ADUs: Los Angeles saw a 2000% increase in units from 2016 to 2017, and the number of units continues to rise each year. However, the increased supply of ADUs does not automatically indicate a similar increase in long-term housing units. ADUs are unlike other rental properties in three important ways: first, not all homeowners use the new units as housing; second, homeowners may discriminate more in tenant selection than absentee landlords,

potentially excluding all strangers; and third, if homeowners are motivated by financial need, then using the ADU as a short-term rental is more flexible and potentially more profitable than using it as a long-term rental.

This raises several researchable questions: Will the increase in ADU permits result in widespread low-cost, long-term rental housing in affluent single-family neighborhoods? Will the addition of new housing in medium- and high-income neighborhoods enable more low-income renters to move into these neighborhoods, or will it reinforce existing socio-spatial housing patterns? To better understand how ADUs will affect the supply of low-cost housing, I examine the socioeconomic and geographic characteristics associated with unpermitted housing units and permitted ADUs, and I assess the extent to which ADUs function as long-term residential properties rather than as short-term rentals or as non-residential space (like a home office or guest room).

The Hegemony of Homeowners in California

The socio-spatial patterns of US cities today still display the effects of early- to mid-twentieth century urban planning and federal subsidies. Los Angeles adopted single family zoning as early as 1921, when it created a lettered system for designating the type of dwelling or establishment allowed in an area (the “A” designation barred any uses other than single-family housing). The advent of the federal subsidy maps the Federal Housing Administration (FHA) created in the 1930s set firm racial and economic neighborhood boundaries in place across the city. By designating mixed-use, racially diverse neighborhoods as ‘hazardous’ for federal subsidies (and outlining these areas in red), the FHA established a precedent of neglecting neighborhoods with Black and Brown people while subsidizing housing in low-density, white neighborhoods. Redlining neighborhoods officially ended with the Fair Housing Act of 1968

(making it unlawful to discriminate in sale or rental of housing because of “race, color, religion, sex, familial status, or national origin”). Decades of federal subsidies directed at predominantly white, suburban neighborhoods is symbolic of an ideology that promotes homeownership as a path toward normal family and good citizenship (Ronald, 2008).

The 2017 legislation reflects the power that homeowners have in California. Starting in the 1960s, an anti-growth movement composed predominantly of affluent homeowners has made serious political gains in the state and in Los Angeles specifically (Fulton, 1997; Purcell, 1997). Proposition 13 cut property taxes and transformed the flow of tax dollars in the state, effectively reducing the fiscal incentive to increase residential construction (Boarnet & Crane, 1998). At the local level, homeowner interests ruled Los Angeles politics, as the City was forced to lower zoning density in the 1980s in compliance with homeowner demands (Whittemore, 2012). In a bid to democratize city planning in the 1990s, Los Angeles voters pushed through provisions to create a system of neighborhood councils. A review of the neighborhood councils found older white homeowners were overrepresented on the boards, and the councils were more interested in land use issues than their constituents (Musso et al., 2007). Local politics boil down to a debate between two affluent groups: homeowners who want to preserve housing values and neighborhood exclusivity and development interests seeking to maximize land use for profit, excluding “renters, racial minorities, the poor, and the homeless” (Purcell, 1997, p. 699).

The anti-growth movement coincided with an international shift toward neoliberal policies that undermined state-backed housing investment, decreasing funding for building and maintenance of public housing and reducing rental subsidies (Schwartz, 2010). Instead, following a free-market ideology that treats housing as a commodity first and foremost, governments like the US implemented policies to strengthen their housing-based financial

markets (Aalbers, 2008; Fernandez & Aalbers, 2016; Rolnik, 2013). The commodification of housing and increased use of housing as an investment asset led policymakers to abandon the concept of housing as a social good (Rolnik, 2013). ADUs reinforce the perception of housing as an investment asset. Homeowners can capitalize on their initial investment in housing (their own home) by converting a portion of their single-family parcel into a rental unit. After recovering the cost of ADU construction and maintenance, homeowners profit from their investment through rental income while potentially increasing the value of their whole property.

But the private property that makes up a home and yard is more than just a physical structure and land: it is a place of safety and privacy that allows a resident a retreat from the outside world; and for middle- and upper-income homeowners, it symbolizes a person's class and social status (Fox, 2002; Ronald, 2008). In Portland, Oregon (Brown & Palmeri, 2014; Gebhardt et al., 2018) and the East Bay, California (Wegmann & Chapple, 2012), survey results show most homeowners use their ADU as a long-term residence. But in Beverly Hills, California (City of Beverly Hills, 2014), results show that less than half of all units are used as long-term residences. Not all homeowners are willing to cede their private property to long-term residents, particularly if they have no financial or familial obligations to do so. Not only does sharing that space curtail the homeowner's privacy, it could signal a change in class or status.

The California ADU legislation focuses on solving the state's affordable housing crisis through small-scale housing production dependent on the desires of individual homeowners. Despite resistance to ADUs from homeowner associations over the past decades (Antoninetti, 2008; McKenzie, 1994), ADUs do not appear to devalue housing or significantly reshape neighborhoods. While the explicit intent of the policy change is to create more housing in the state by densifying single-family neighborhoods (California, Government Code §65852.150),

implicitly, it further cements the hegemony of affluent homeowners who get to determine housing outcomes for the state. ADUs give homeowners authority over who moves into the neighborhood and can access the amenities the neighborhood offers in a way that multiunit residential building never could. Homeowners hold the position of gatekeeper, determining when to construct or deconstruct an ADU, whether to use the ADU as housing, and who gets to live in the unit.

As researchers have shown repeatedly, the neighborhood a person lives in affects their access to healthcare, transportation and employment opportunities, quality food, educational opportunities, and local amenities (see for instance Chetty et al., 2016; Kirby & Kaneda, 2005; Larson et al., 2009; Quigley et al., 2008, etc.). Proponents of ADUs believe that adding more ADUs to a neighborhood will lead to class and race integration (Brinig & Garnett, 2013). Increasing housing in middle- and high-income, low-density neighborhoods should increase the number of individuals who can afford to live in the neighborhood and access the neighborhood's amenities. Not only does this assume that ADUs are primarily used for long-term housing and that they are low-cost relative to other rental housing, but this idealized picture of ADUs and their ability to desegregate US cities assumes that homeowners will be willing to rent out space to tenants who are outside their social networks. The Fair Housing Act prohibits discrimination in housing based on race, but not all discriminatory practices are blatant and easy to identify. For instance, housing discrimination occurs in how website algorithms for sites like Facebook target who sees advertisements for housing (Spinks, 2019). Further, the Mrs. Murphy exemption specifies that single-family properties with a resident landlord and one roomer or boarder is not subject to the legislation (according to California's version of the exemption).

ADU Policy History

ADUs are not a new form of housing in Los Angeles, but a prejudice toward single-family neighborhoods led to a variety of municipal regulations to block their construction on single-family parcels during the second half of the twentieth century (Gellen, 1985; Mukhija, 2014). Local resistance to ADUs came from both municipal governments and neighborhood and homeowner associations, which function as private governments with the single goal of maintaining stability and home values in their neighborhood (McKenzie, 1994).

Since the 1980s, the California state legislature has made several attempts to overrule restrictive local legislation and increase property owners' ability to build second units on single-family lots legally. However, in the United States, land-use decisions are considered the domain of the local government dating back to the 1926 case of *Village of Euclid v. Amber Realty Co.*, when the Supreme Court upheld local authority over zoning practices as a form of police power (Infranca, 2019). Until recently, state efforts to increase housing did so through legislation aimed at guiding local decisions rather than wresting control (Infranca, 2019).

In 1982, the legislature adopted Government Code §65852.2, also known as the second unit law, as a way of enabling local agencies to adopt new regulations allowing second units in certain residential areas. Los Angeles followed the directive, and in 1985 the City adopted new rules (Los Angeles, California, Municipal Code §12.23 W.43 & W.44) that enabled homeowners to request a permit to build an ADU through a conditional use process subject to local standards.

Recognizing the ineffectiveness of the 1982 legislation in enabling homeowners to permit ADUs, the California legislature tried to limit the amount of local oversight required in their next bill. In 2002, the state passed Assembly Bill 1866 to turn the conditional use process into a by-right process for homeowners. As long as residents in certain residential zones met the required

code elements, they were automatically granted a permit to build a unit. In 2003, the City of Los Angeles's Department of City Planning and Department of Building and Safety issued an Interdepartmental Correspondence to confirm that the City would comply with state standards.

Despite the multiple attempts to bypass local roadblocks, the state was unsuccessful in reducing regulations enough to significantly increase ADU permitting throughout the state. Figure 1 shows the number of permits for ADUs from 2001 to 2018 for the City of Los Angeles. Though the number of permits issued by the City of Los Angeles doubled from 2003 to 2004, the City still granted fewer than 100 permits for ADUs per year throughout the decade. This potentially resulted from confusion about the differences between the existing 1985 city ordinance (requiring conditional use permitting) and the newer statewide regulations (granting by-right permitting). This confusion is reflected in the 2009 Action Update on Accessory Dwelling Units issued by the Director of Planning and directed at Neighborhood Councils and City Council members, as well as a 2010 Zoning Administrator Interpretation issued by the city's Chief Zoning Administrator (ZA 120), both of which reaffirmed the city's compliance with state standards. And finally, in 2013, the City Council adopted an update to the Housing Element in the city's General Plan to affirm the city's compliance with the state law. The 2013 General Plan update coincides with an increase in permits for ADUs in Los Angeles; Figure 1 shows the annual number doubled in 2013, rising from 63 to 126 permits for ADUs. Still, the number of ADU permits issued through 2016 was relatively low. And a 2016 Los Angeles Superior Court judgement ruling against the City's use of the ZA 120 memorandum could have reduced the number of permits further.

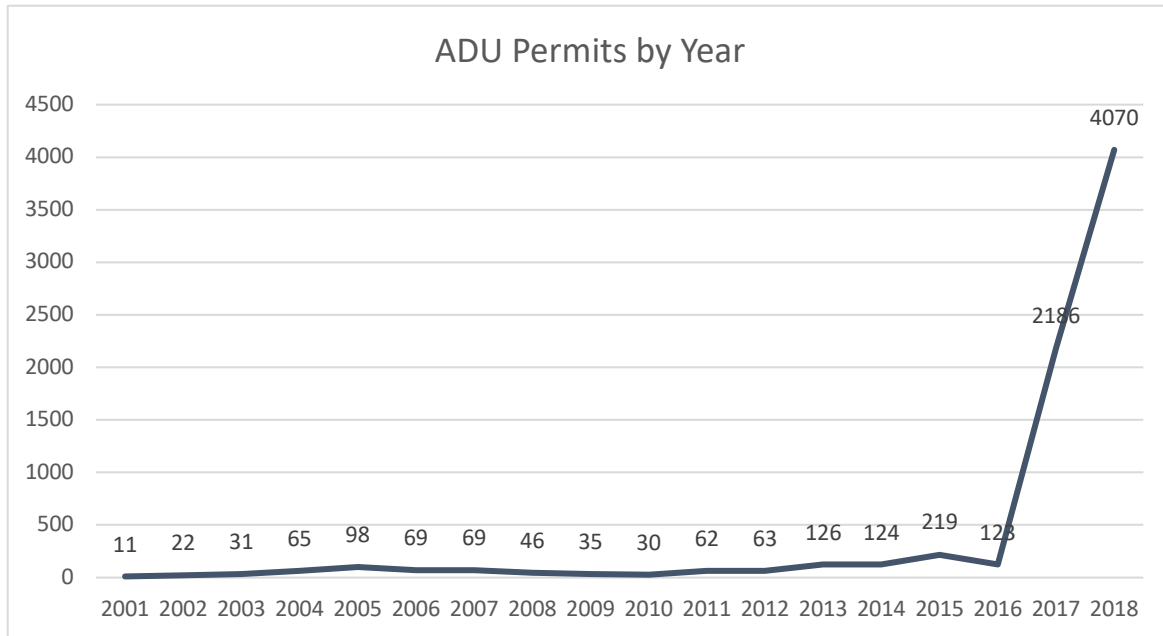


Figure 1. Total Permits for ADUs in the City of Los Angeles by Year, 2001-2018

The statewide ADU policies that went into effect in 2017 were finally successful in countering local obstacles (California Assembly Bill 2299 and Senate Bill 1069). Unlike previous attempts, this legislation made null and void all local legislation that did not comply with the statewide mandate. By changing the permitting process from a conditional use to a by-right process, the state diminished the procedural hurdles necessary for homeowners to pull a permit. As a result, the number of permits pulled for ADUs in the City of Los Angeles surged. As Figure 1 shows, the number of permits rose by 2000% between 2016 and 2017, and then doubled once more from 2017 to 2018.

The by-right legislation does not completely remove restrictions on homeowners seeking to build an ADU. ADUs can only be built on a property zoned for single-family or multi-family residential use, and the property must contain an existing single-family dwelling (or the primary single-family dwelling will be built concurrently with the ADU). ADUs are limited in size to 1200 square feet or 50 percent of size of the primary residence on the property. Though the city's

Department of Planning was considering restrictions on ADU permitting in Hillside areas (City of Los Angeles, 2017), the ordinance was not finalized until 2019. As of 2019, Los Angeles does not permit ADUs on any parcels in a Very High Fire Hazard Severity Zone, and it restricts the number of permissible parcels in Hillside Areas (Los Angeles, California, Municipal Code §12.03 & §12.22) by requiring that homeowners implement additional precautionary measures to ensure the future safety of ADU residents.

In addition to the permitted ADUs, researchers suspect between 50,000 and 200,000 unpermitted secondary units exist in Los Angeles (Brown et al., 2017; Mukhija, 2014). As of May 2017, a process exists for owners of a residential or mixed-use building to permit existing unpermitted units in a multi-family zone and occupied as a housing unit between 2010 and 2015 (Los Angeles, California, Ordinance No. 184,907). The process differs from the ADU permitting process and is not specifically meant for ADUs. Fewer than 100 homeowners have taken advantage of the ordinance since 2017.

Overview of Chapters

In chapter 1, I examine methodologies to enumerate unpermitted housing units in Los Angeles. Unpermitted ADUs in Los Angeles limit which single-family parcels meet the requirements for building a permitted ADU. Existing enumeration methods in Los Angeles do not capture unpermitted housing at a granular level, obscuring socio-spatial patterns within the city and making a comparison with permitted ADUs difficult. To produce a city-wide enumeration of unpermitted housing units scaled to the neighborhood-level, I examine four existing methods to enumerate unpermitted housing in North American cities, including Los Angeles, CA (Mukhija, 2014), Hamilton, ON (Kinsella, 2017), Calgary, AL (Poorten & Miller, 2017), and cities across California (Wegmann & Mawhorter, 2017). I then pull elements from

two of these methods to enumerate unpermitted housing units in Los Angeles at the census block group level.

The census counted nearly 50,000 more residential units in Los Angeles in 2010 than were captured through permit data collected by the Assessor. Though this estimate is similar to previous estimates of unpermitted secondary units in Los Angeles, these unpermitted units are in block groups unlikely to have many ADUs: these block groups have low rates of single-family homes and homeowners. This suggests subdivided apartments in multiunit buildings make up a large share of the unpermitted units captured through this method.

Chapter 2 examines how the 2017 regulatory changes affected ADU permitting in Los Angeles. Housing theory suggests that high rents incentivize rental property construction; however, homeowners in the very neighborhoods with high rents are most likely to implement restrictive policies to block construction of new units. But ADUs are unlike other types of rental housing. Research on ADUs frequently focuses on how regulations hinder production, but it has yet to examine whether ADU production responds to removing regulations as economic theory predicts it should. The regulatory change offers a unique opportunity to understand the extent to which middle- and high-income neighborhood intervention limited ADU permitting and what drives ADU permitting at the neighborhood level. I do this by examining pre-regulation and post-regulation permits separately in relation to economic and non-monetary neighborhood characteristics, like household, demographic, and geographic variables. ADUs are only allowed on parcels that have one other single-family residence, so the number of possible units varies greatly from block group to block group, so I normalize the number of units across Los Angeles

by taking pre- and post-regulatory ADU permits as a percentage of available single-family residential (SFR) parcels in a census block group.

The average median household income for block groups with ADU permits rose following the regulatory change, suggesting middle- and high-income neighborhoods were more restrictive than lower-income neighborhoods prior to the regulatory change. However, relatively few homeowners in very high-income neighborhoods pulled permits for ADUs in either time period. And neighborhoods with a high share of ADU permits relative to the total number of SFR parcels are more likely to be lower income. Further, median rent is less important than other non-monetary factors in determining where ADU permits are pulled. Median rent for block groups with permits rose slightly following the regulatory change; however, median rent in the neighborhood loses significance once non-monetary variables, like the rate of ownership and geographic location, are taken into account. In particular, the percent of households with non-relatives appears to factor into where ADU permits are pulled. In neighborhoods where people already share housing with non-related individuals, like roommates and boarders, homeowners are more likely to get a permit to build an ADU. This confirms that ADUs are unlike other types of housing, in that homeowners do not appear to be primarily motivated by the opportunity to earn high rents.

Chapter 3 investigates the promise of ADUs as low-cost housing through a survey of homeowners who pulled a permit to build an ADU in the City of Los Angeles between 2013 and 2019. Of the 6,500 homeowners with a permit, close to 5% completed the survey. Participants responded to a range of questions about ADU use, construction and financing, as well as several socioeconomic questions. I combine responses to questions about usage with responses to

socioeconomic questions to understand what characteristics are associated with use as a long-term residential unit rather than a short-term rental or a non-residential property. Further, I examine the rents homeowners charge to understand how ADUs compare to other rental properties in the same neighborhood after accounting for size and relationship to the tenant.

Results of the survey suggest that the recent surge in ADU permits will marginally add to the supply of low-cost, long-term housing in Los Angeles. ADUs are a unique form of housing, as they are not always used as a separate housing unit. Not all homeowners express a willingness to share their private space with a stranger, and high-income homeowners are more likely to use the ADU as an office or guest room rather than as a residence of any kind. While homeowners are incentivized to build an ADU for a variety of reasons, they are primarily driven to share their private space by economic need or a familial relationship.

Chapter 1: Enumerating Unpermitted Housing in Los Angeles

In an effort to encourage more housing development across the state, California legislators passed the 2017 legislation making it easier for homeowners to pull permits to build an accessory dwelling unit (ADU) on their property. The addition of ADUs in single-family neighborhoods promises to vastly increase the number of housing units by doubling the parcel density of low-density areas neighborhoods. With around half a million single-family homes in the City of Los Angeles, this legislation has the potential to dramatically increase housing in the city. However, many single-family homes already have a second unit on the property: an unpermitted ADU. Estimates of unpermitted units in the City of Los Angeles range from 50,000 to upwards of 200,000 units (Brown et al., 2017; Mukhija, 2014).

The supply of informal housing in North American cities is geographically uneven: various forms of informal housing exist in different places, depending on the built environment, enforcement of rules, and demand for housing. Existing enumeration methods in Los Angeles capture unpermitted housing at a subregional or city-wide scale, obscuring neighborhood-level differences within the city. I examine four existing enumeration methods urban planning researchers have used to enumerate unpermitted or secondary housing units in North America. Based on these methods, I produce a city-wide enumeration of unpermitted housing units at the census block group level for Los Angeles. As a proxy for permitted housing, I use data from the Los Angeles County Office of the Assessor and compare it to total housing units as compiled during the decennial census in the same year. This method suggests that the census counted nearly 50,000 more units in Los Angeles in 2010 than were captured through permit data collected by the Assessor. This estimate is similar to previous estimates of unpermitted secondary units in Los Angeles. However, a large share of these unpermitted units is in block

groups with low rates of single-family homes and homeownership, housing patterns that are atypical for ADUs but more likely for subdivided apartments in multiunit buildings. An enumeration at the parcel rather than block group level would provide an even more accurate representation of unpermitted housing units in Los Angeles.

Informal Housing in the Global North

The high visibility of informal settlements, slums, and favelas in the cities of the Global South reinforces the belief that housing informality is limited to low-income countries and synonymous with poverty. Recent research on informal housing in North America challenges both misconceptions. Informal housing is not a new phenomenon in the United States, but it has received comparatively little attention from researchers. This is in part because housing informality in the United States is hidden and interwoven into the formal market (Durst & Wegmann, 2017), making it difficult to identify and study.

In high-income countries, informal housing is generally better concealed than it is in many low-income countries. And because it is so well hidden, some researchers have overlooked its presence in the United States and other high-income countries entirely. In his book on housing policy around the world, Angel (2000), reports that unauthorized housing (or informal housing) was essentially nonexistent in high-income countries like the United States in 1990 (p. 329). However, informal housing exists in many forms in the US, though an exact estimate of its prevalence does not exist. Baer's (1986) examination of the 'shadow market' in housing asserts that there were a million more housing units in the 1980 census than could be accounted for in new construction tallies (p. 30). No recent tally of informal housing across in the United States exists, but a recent study of informal secondary units in the City of Los Angeles estimates 50,000

unpermitted secondary units in the city (Mukhija, 2014). Other estimates suggest the figure is much higher (Brown et al., 2017).

Portes and Haller (2010) point out that a paradox of the informal economy is that “the more credible the state enforcement apparatus is, the more likely its record-keeping mechanisms will miss the actual extent of the informal economy” (p. 418). There are some forms of informality that are necessarily visible, like street vending, where visibility is necessary for vendors to earn a living. And other forms of informality, like tents on sidewalks or in parks for unsheltered people, are difficult to hide. But in American cities, informal housing takes the form of illegally subdivided apartments and unpermitted secondary housing units, both of which are largely hidden from public scrutiny (Durst & Wegmann, 2017; Mukhija & Loukaitou-Sideris, 2014).

Defining informality is an important step toward understanding the extent to which it exists and its contribution in the Global North. In the section below, I examine what we know about informality before looking more closely at informal housing. Finally, I examine existing methods to enumerate informal housing in the Global North.

Defining Informality

Informality encompasses a wide array of income-generating activities. Scholars frequently identify informality in opposition to formality, or state-sanctioned and regulated activities. In a frequently cited definition of informality, Castells and Portes (1989) explain informality as income-generating activities that are “unregulated by the institutions of society, in a legal and social environment in which similar activities are regulated” (p. 12). Informality is a type of non-compliance with rules, regulations, and laws set out by state institutions (Durst & Wegmann, 2017). But scholars generally distinguish informal activities from criminal activities,

or activities socially defined as illicit (Feige, 1990; Portes et al., 1989). According to this definition, street vending without permits is informal rather than criminal, unless the items sold are themselves illegal. And informality is neither inherently negative nor positive (Mukhija & Loukaitou-Sideris, 2014; Portes et al., 1989).

Research on informality challenges two persistent and related myths about informal activities. First, informality is neither synonymous with poverty nor driven purely by economic need; it cuts across all social and economic strata (Mukhija & Loukaitou-Sideris, 2014; Portes et al., 1989; Roy, 2009). Informal activities do offer an economic incentive, but this incentive is not restricted to low-income people (Mukhija & Loukaitou-Sideris, 2014). Examples of informality are most visible in poor areas, like informally constructed housing in slums and favelas; however, informality is common in middle and high-income neighborhoods as well. For example, Mukhija (2014) demonstrates that informal secondary units in Los Angeles are distributed across the city, not just in low-income areas. Shoup (2014) explains how informal parking markets benefit residents of high-income buildings in New York and San Francisco, and Vallianatos (2014) describes gourmet food trucks that service high-income neighborhoods without formal permits. Informality exists in many economic spheres and many factors contribute to its existence.

Second, informality/formality is a false dichotomy (Portes & Schauffler, 1993; Roy, 2009; Varley, 2013). Discussions of slums and the informal settlements suggest bounded, identifiable spaces. But informality is not limited to these areas, nor are these areas always completely informal. Informality exists in many forms, and many of these are outside of areas easily designated as informal, like middle- or upper- income housing constructed without all necessary permits and procedures (Roy, 2009a). Informality in the Global North confirms how

enmeshed it is into formal systems (Durst & Wegmann, 2017; Mukhija & Loukaitou-Sideris, 2014). For example, in Los Angeles, informal housing exists across the city and is not relegated to a single neighborhood (Mukhija, 2014), and an informally constructed unit might still adhere to many formal regulations. Because informality is deeply entangled in formal systems, it is difficult to define.

Informal Housing Distribution

Informal housing is heterogeneous and unevenly distributed (Durst & Wegmann, 2017). Different forms exist in different places, and some neighborhoods have high rates of informality while others may have none. For instance, a count of unpermitted secondary units in Los Angeles finds an uneven distribution across subregions in the city (Mukhija, 2014). The presence of unpermitted secondary units does not simply reflect the needs, means, and opportunity of the homeowner to build a unit. Unpermitted secondary units do not correspond to either the number of available parcels, wealth distribution, or housing demand in the city. Regulations and enforcement impact informal housing production, but the relationship between regulations, enforcement, and informality is complex and not fully understood.

A popular theory argues that informality results from over-regulation of economic markets (Brueckner & Selod, 2009; de Soto, 1989; Dowall, 1992). The state intervenes in the economy by creating regulations, which in turn increase the cost of participating in the regulated activity. The high cost motivates participants to circumvent the regulations to keep the costs low. Over-regulation paired with weak enforcement of those regulations results in informality, or non-compliance with those regulations. However, many factors contribute to non-compliance, and stringent regulations with enforcement can still result in non-compliance (Monkkonen & Ronconi, 2013).

Deregulation can also lead to informality. This theory argues that the state deliberately does not regulate certain activities or spaces. “Deregulation indicates a calculated informality, one that involves purposive action and planning, and one where the seeming withdrawal of regulatory power creates a logic of resource allocation, accumulation, and authority” (Roy, 2009, p. 83). This is not simply state failure but the use of informality to shape a region. In the United States, deregulation arises in cases of weak regulation and fragmented governmental oversight, as in the case of unserviced *colonias* that developers build in weakly regulated urban peripheries (Durst & Wegmann, 2017).

A different strand of research focuses less on regulation and more on enforcement. Castells and Portes (p. 27) maintain that governments use the informal economy as an outlet for disenfranchised workers and a means of avoiding social conflict. Like with the deregulation theory, informality does not develop outside of state influence; rather informality develops because the state allows it to. The state determines how and where it enforces regulations—it can willfully ignore or legitimate informal activity (Durst & Wegmann, 2017; Wegmann, 2014). For instance, homeowners in Los Angeles have built secondary housing units on their property without the proper permits for years. These units offer additional housing in a tight housing market, and the permit enforcement agencies are ill-equipped to respond to all permit issues. Not enforcing permit regulations essentially legitimates these activities. Through non-enforcement, the state creates or maintains informality.

Neighborhood-level regulatory mechanisms, like neighborhood planning committees, homeowner and neighborhood associations affect the production of permitted housing units, suggesting that they can also affect non-compliance. Van der Poorten and Miller (2017)’s research on unauthorized secondary suites in Calgary suggests that powerful homeowner groups

and community associations play a role in restricting the development of secondary suites in high-income neighborhoods. This suggests that local regulations and enforcement are effective at blocking informal housing. A better understanding of the relationship between regulations, enforcement and informality will follow a more thorough, city-wide enumeration of informal housing at a neighborhood-level scale.

Defining Informal Housing

Housing informality encompasses a wide range of housing types. Informal housing includes housing as disparate as campers grouped in ‘tent cities’, the unregulated sale of otherwise formal housing, and the division of a single residence into two without proper permits. Broadly, informal housing defies formal rules around property rights, permits, or building codes (Durst & Wegmann, 2017). Durst & Wegmann categorize informality in the United States in relation to five regulatory regimes: property rights, property transfer, land-use and zoning, subdivision regulations, and building codes. Housing that is informal in one sense will not necessarily be informal across all regulatory regimes. For example, housing informality that results from an informal property transfer might still be compliant with building codes and land-use regulations.

I examine four strategies for enumerating one particular type of informal housing: housing units that are non-compliant because they have not gone through the permitting process (also known as unpermitted housing units). In cities like Los Angeles, unpermitted units do not comply with land-use regulations or zoning and building codes. Unpermitted housing units include unpermitted secondary units built on single-family or multi-family properties, unpermitted additions or conversions in multi-family buildings, and unpermitted conversions of nonresidential buildings. Discussions of housing informality in California largely focus on

unpermitted accessory dwelling units (ADUs) (Antoninetti, 2008; Chapple et al., 2011; Mukhija, 2014; Ramsey-Musolf, 2018; Wegmann & Chapple, 2012). ADUs are typically small, secondary housing units on parcels with an existing single-family unit. With high levels of low-density housing in urban areas, California has a long history of homeowners building ADUs on their property. In many jurisdictions around the state, strict zoning codes limited permitted construction of these units (Antoninetti, 2008). Despite several attempts to ease local restrictions through state level interventions over the past fifty years, few homeowners successfully obtained building permits for these secondary units on their property. However, this did not stop homeowners from constructing ADUs. In Los Angeles, an estimated 50,000 ADUs do not have permits (Mukhija, 2014).

Enumerating Unpermitted Units

The four studies I examine here take three approaches to the enumeration problem. The first relies on a text analysis of real estate listings to identify unpermitted secondary units (Mukhija, 2014). From the number of houses with unpermitted units, the researcher deduces the total number of unpermitted units across the city. The second approach is an in-the-field analysis of housing; a visual analysis of each residence provides evidence of secondary housing units in the neighborhood (Kinsella, 2017). The third approach relies on secondary data, and two of the studies (Poorten & Miller, 2017; Wegmann & Mawhorter, 2017) use this tactic. This approach compares an official permit database to a comprehensive count of housing units in the area. The number of unpermitted units is the difference between the full count of housing units and those with permits. While similar in broad terms, the two studies using secondary data differ in data and execution.

Table 1 summarizes the attributes of each study, identifying the city or region of the study, the geographic scale of the research, the general approach to the research, the focus of the enumeration, the accuracy of the approach to enumerating informal housing, and the replicability of the method in other cities or regions.

Table 1: Enumeration Methods

	For-Sale Listings (Mukhija, 2014)	Visual Count (Kinsella, 2017)	Land-Use Data (Poorten & Miller, 2017)	Permit Applications (Wegmann & Mawhorter, 2017)
City/Region	Los Angeles, CA (US)	Hamilton, ON (Canada)	Calgary, AL (Canada)	California (US)
Scale of Analysis	City-wide	Neighborhood	City-wide	Multi-city
General Approach	Text Analysis	Field Analysis	Secondary Data Analysis	Secondary Data Analysis
Research Focus	Unpermitted secondary housing units	Secondary housing units	Unpermitted secondary housing units	Unpermitted housing units
Accuracy	Medium (extrapolation from limited data)	High	High (depending on accuracy of secondary data)	Medium (depending on accuracy of secondary data)
Replicability	High	High	Medium (depending on availability of data)	High (depending on availability of data)

I discuss each method in detail below and then compare the approaches, identifying a method that suits my purposes. Ultimately, I combine the permit applications approach (Wegmann & Mawhorter, 2017) and the land-use data approach (Poorten & Miller, 2017) to enumerate unpermitted housing units at the neighborhood-level in Los Angeles.

For-Sale Listings

Mukhija (2014) uses a count of for-sale listings with secondary housing units to determine the number of unpermitted secondary units in the City of Los Angeles. He extrapolates the number of unpermitted housing units in the City from real estate listings by

analyzing a batch of these listings from a particular time period for a mention of a secondary housing unit on the property. By searching for specific terms in the listing, the researchers can identify likely units. Of the 3,000 real estate listings for single-family homes recorded with an online real estate brokerage in Spring of 2012, 168 had identifiable unpermitted secondary units. Because there are so few identifiable unpermitted units through this method, it is not possible to segment them into small geographic spaces with any sort of reliable results. Mukhija looks at the distribution of unpermitted units across seven Area Planning Commissions (APC) in Los Angeles. The APCs are planning divisions that consist of between 100,000 and 800,000 housing units.

This research examines a specific type of unpermitted housing unit; specifically, the focus is on unpermitted secondary units rather than all types of informal housing units. This form of housing is most frequently attached to single-family dwellings rather than any other form of housing unit. While the method might capture some unpermitted units attached to duplexes, it is unlikely to catch informal housing in multi-unit buildings. Overall, the method is unlikely to capture more informal housing units than exist. However, it is likely to undercount the number of informal housing units in the city. The author concludes that the number of unpermitted secondary housing units in the city far surpasses the number he derives from the methodology, suggesting the number of units is closer to 50,000.

A major advantage of this approach is that the data is retrievable online, and it is possible to replicate this methodology over time and in different places. However, replication requires keywords specific to each regional informal housing type.

The data source is also a disadvantage. Many online real estate brokers are private companies that provide limited access to their data. Further, the data is not representative of the

market as a whole. As there are many online real estate brokers, no one broker has a complete list of all for-sale residences and not all homeowners use online real estate brokers. Further, not all homeowners willingly reveal the existence of unpermitted secondary units.

Visual Count

Kinsella (2017) tests a field enumeration tool on two neighborhoods in Hamilton, Ontario. Though similar in socioeconomic characteristics, the housing stock of the two neighborhoods is different, providing a good means for establishing the usefulness of the tool across different landscapes. The goal of the tool is to identify secondary housing units through visual analysis in the field; it does not specifically count unpermitted housing units, but a comparison of the field data with local land-use data would be sufficient for identifying unpermitted units.

The researchers conduct a census of external physical characteristics of each address to pinpoint indicators of secondary housing units, property by property. These characteristics include structural modifications to the house, such as abnormally large parking areas or painted lines to demarcate parking spots, and behavioral modifications of the house, such as additional mailboxes or doorbells. The research does not specifically target unpermitted units; however, with a slight modification (comparing the results of the visual analysis to land-use records), the method would function to enumerate unpermitted secondary units.

Gathering information about secondary units is more difficult in a neighborhood with high-rises and rental townhomes than in a neighborhood with single-family homes, duplexes, or triplexes. This methodology attempts to capture hidden housing units through analysis of minor structural and behavioral modifications. In larger building complexes, these external modifications are less visible. This methodology undercounts the total number of additional

units, particularly in more densely built neighborhoods where larger building complexes are typical.

This method is replicable with limited secondary data. Just using a log of permitted units and the results of the visual analysis, researchers can deduce which units were built without a permit. However, this is a high-cost and time-consuming method. Unlike other methods that use existing secondary data, this requires researchers to spend time visiting each house in a neighborhood to count units. For that reason, scaling up from a neighborhood analysis to a city-wide analysis would require considerable time, money, and labor.

Land-Use Data

Poorten & Miller (2017) compare data from the Calgary Civic Census to land use data to estimate the number of secondary housing units built without permits. The annual Civic Census has information about the number of housing units and type of tenure in each, and from this, the researchers were able to identify secondary housing units and tenure type in each. The land use data contains information about the allowable uses and number of units for each parcel.

Matching these two data sets provides the researchers with both the unpermitted secondary housing units and the tenure type of each location. Of the nearly 14,000 secondary units in Calgary this method uncovers, 98% were built without the proper permits. After comparing this data to socioeconomic data at the neighborhood level, Poorten & Miller determine that neighborhood governance practices work concurrently with city-wide zoning restrictions to control informal housing.

There are several advantages to this methodology. Assuming a high level of accuracy in both datasets, the resulting data on unpermitted secondary housing units is also accurate. And with information at the household or parcel level, the measurement of unpermitted units is also

precise, making it possible to examine at the relatively small spatial scale of a neighborhood.

Neighborhoods in Calgary range from one to 20,000 dwellings, a much smaller geographic scale than the APCs in the for-sale listings study in Los Angeles. Another benefit of this study is that the data provides information beyond just the number of unpermitted units. Because the Calgary Civic Census provides detailed information about tenure of the household, this method allows for information about tenure at each household.

One major limitation of this method is that it is difficult to replicate in other cities. The Calgary Civic Census provides extremely detailed information about each household. The decennial US census collects data at the household level, but this data is restricted to maintain privacy. Without access to the restricted dataset, researchers only have access to data at the block, block group or census tract level (depending on the specific variables). This decreases the accuracy of the results.

Permit Applications

Wegmann & Mawhorter (2017) propose a methodology to compare the share of informal housing, which they use to examine cities in California. And Brown et al. (2017) draw on this method to determine the share of unpermitted single-family housing units in the largest cities in the United States. In order to find the total number of unpermitted housing units, Wegmann & Mawhorter find the difference between total households added to the census count from one decennial census period to the next and the change in housing units based on permit applications during the same time period. The US Census Bureau conducts a complete census of every household in the United States every ten years. The researchers use the change in housing units between two decennial census periods as an approximation of all new housing in a region. They compare this to the change in permitted housing by combining total building permits, annexed

units, and demolitions for the same region. Assuming that the decennial census provides a complete and accurate count of all existing housing units and that the count for all permitted units is complete and accurate, the difference between the two numbers provides the totals of unpermitted housing units by city. The Census Bureau collects permit data at the city-level, making it impossible to segment the data at a smaller geographic scale.

An advantage of this strategy is that it avoids problems in historic building permit data. Los Angeles's historic building records are riddled with errors, when they do exist in a digital form, which I discuss in more detail later. This methodology bypasses this problem by focusing on the change in informal units rather than the absolute number of informal units. The resulting number only includes buildings that have had a recent change in the number of housing units.

The accuracy of this method hinges on the accuracy of the two primary datasets used: the decennial census and the census of building permits. Despite some measurement error, the decennial census data is the most accurate source of housing units available in most US cities. The accuracy of the data from the US Census Bureau's Building Permits Survey is more questionable. The Census Bureau collects permit information monthly from permit-issuing places nationwide and maintains a historic record of this information. The accuracy of this data is dependent on the frequency with which cities respond to the survey. Responses are voluntary and for any missing responses, data is imputed. Though many permit-issuing places respond regularly, this does not appear to be true of all places. For instance, data from the Los Angeles region shows several cities without any variation month-to-month in construction numbers, suggesting the Census Bureau imputes the numbers regularly.

Comparing Methods

Existing studies fail to enumerate unpermitted ADUs for a whole city broken down by neighborhood. The land-use data method (Poorten & Miller, 2017) specifically focuses on unpermitted secondary housing units, enumerating these units at a household level for a whole city, but the study relies on the Calgary census for the count of total housing units, so applying this method to another city requires access to a similarly comprehensive dataset. Without access to household level survey data for Los Angeles, measuring unpermitted ADUs becomes a challenge. The for-sale listings method (Mukhija, 2014) captures unpermitted ADUs, but the sample size the method elicits does not allow for neighborhood-level analysis. And the visual count method (Kinsella, 2017) would require a great deal of time and money to scale up for a city-wide analysis. The permit applications method (Wegmann & Mawhorter, 2017) measures unpermitted housing at the city level, and the data source does not enable a sub-city analysis of housing units. In order to capture unpermitted units at the neighborhood level in Los Angeles, I combine the permit applications approach (Wegmann & Mawhorter, 2017) and the land-use data approach (Poorten & Miller, 2017). Like the permit applications approach, I compare the city's data on permitted housing units to data from the decennial census. However, rather than comparing the change in units over time, I compare two datasets at the same point in time, like the land-use data approach. These data do not capture unpermitted ADUs specifically, rather give an estimate for all unpermitted housing.

Methods and Data

The goal of this chapter is to identify a method to enumerate unpermitted housing units in Los Angeles at the neighborhood-level across the whole city. Unpermitted housing includes all housing units that are non-compliant because they do not go through the permitting process and

may not comply with land-use regulations or zoning and building codes. Without permits, these units are not counted in municipal data compiled through building permit records. Enumeration methods generally focus on distinguishing between the municipal data and a more thorough census of housing units in an area.

I base my methodology for locating unpermitted units on a combined methodology from those I discussed above. Poorten & Miller's (2017) comparison of civic census data to land-use data provides an accurate count of unpermitted units at the individual household, allowing for an analysis of informal housing and housing policy at a small scale within the city. However, the same data sources are not available in all cities. To identify unpermitted units in Los Angeles, I consider alternative data sources used locally.

Wegmann & Mawhorter (2017) compare the number of permits recorded by each city over ten years to the number of housing units recorded in the census count for the same time period. This method uses the decennial census count of housing units as the count of all housing, regardless of permit status. And each city records building, demolition, and alteration permits. Comparing the two sets of numbers provides the number of unpermitted units across the city. However, the US Census Bureau's Building Permits Survey maintains historic records of permit applications for cities, but it does not maintain records at a smaller spatial scale. And while some cities and counties might have extensive historic records with a spatial designation, the Los Angeles Department of Building and Safety (LADBS) does not have full digital access to building permit records from before 2001. The Los Angeles County Assessor, an alternative source of permitted units, does not maintain historic parcel maps or records dating back to 2000, the year that the decennial census was conducted (April 1, 2000).

I calculate the total unpermitted units rather than the change in unpermitted units over a particular time period. To do this, I use the Los Angeles County Assessor parcel files.

Scale

I compare units according to the county's assessor database to the census units at the block group level. Census block groups stand-in for neighborhoods in this research. Census block groups, subdivisions of tracts, are statistically defined areas containing between 600 and 3,000 people. Statistically defined areas like block groups have arbitrary boundaries, thus they are not a perfect representation of neighborhoods or housing sub-markets. But the US Census provides socioeconomic and demographic information at the block group level, and block groups are a closer approximation to a neighborhood than either Census blocks (which are smaller than block groups) or tracts (Sperling, 2012).

Data

Full housing unit count: The US Census collects data at the household level, but makes it publicly available at the block, block group, and tract levels. Census blocks are smallest statistical area the census publishes, and they are the building blocks for other geographic boundaries the Census uses. In cities, they are often the size of city blocks. Block groups are an aggregation of blocks and smaller in size and population than census tracts. They have a smaller and less reliable sample size than census tracts, but they are frequently a better approximation of a homogeneous neighborhood than the larger geographic boundary (Sperling, 2012).

The US Census Bureau conducts a full count of all households every ten years on the official Census Day, April 1st. The housing unit count is primarily based on their Master Address

File, a database of addresses in the United States that they regularly maintain, ramping up maintenance leading up to the census year. Field canvassers verify addresses in the year leading up to the census. However, the housing unit count is imperfect, and the Census Bureau identifies three challenges in their process: inaccurate recording of boundaries, inaccurate geocoding of addresses, and duplication and exclusion of addresses (Bureau of the Census, 2011). In addition to measurement error, the Census Bureau limits individual disclosure by swapping persons from one geographic unit to another (in case households or individuals are identifiable from the data). This added noise is less problematic at the city level, as the large population size prevents exposure of individual households.

Permit data: The Los Angeles County Office of the Assessor maintains a database that contains the official record of all taxable parcels in the county with the official number of units at each property. Any additions or changes to the database come from the various city-level permit offices first; it is rare for the database to include units that are not first logged by the city's permitting office.² The Los Angeles County Office of the Assessor uses building permit records to update parcel files. For the City of Los Angeles, these records come from LADBS. LADBS issues and records all permits for construction, alteration, and repairs of a building on private property in the City of Los Angeles, and the permits list the number of permitted housing units on the parcel. This data, including the number of permitted housing units per parcel, moves to the Assessor, which updates its parcel data to reflect any new building permits pulled for each parcel.

Because the tax roll year for Los Angeles County begins July 1 and ends July 31, the 2010 assessor tax roll should be the closest match to the census count (which are keyed to census

² Phone interview with LA County Assessor representative from the Hall of Administration on September 24, 2019.

day on April 1, 2010). However, the 2011 assessor tax roll matched the 2010 census records most closely, so I use the 2011 records, discarding units built in 2010. The Office of the Assessor does not retain historic shapefiles, so geocoding the 2011 data requires matching this data to a more recent shapefile, like the 2017 assessor parcel shapefile. After geocoding the 2017 assessor parcel shapefile by joining it to the 2010 census block group shapefile, I match the results to the 2011 assessor data. As some parcels have changed between 2011 and 2017, I use a parcel change file from the county's Open Data site to link parcels where possible. Combining the resulting parcel data based on unit type and number by census block group results in approximately 3.29 million residential units divided across the 6,387 block groups in Los Angeles County (1.48 million single family units, 287 thousand condo units, and 1.52 million multi-residential units). In comparison, the 2010 census records 3.44 million housing units in LA County. I drop all but the 2,493 block groups entirely within the City of Los Angeles and with a residential unit count for both the census and the assessor data.

ACS, Census, and LADBS data: I examine correlations between the unpermitted housing units and data from the American Community Survey (ACS, 2009-2013 5-year estimates) and the 2010 decennial census. I include data on households in each block group, including the percent of vacant units, population density, percent owners, percent of housing units built since 2000, and percent of single-family residential parcels in the block group. As a point of comparison, I use ADU permit data from LADBS as a percent of homeowners. Table 2 shows the descriptive statistics for each variable at the block group level for 2,493 block groups in the city with at least ten housing units according to both the census and the assessor data. The descriptive statistics include the total number of block groups with data for each variable, the mean, median, and standard deviation for each variable, and the minimum and maximum value.

In addition to ACS, Census, and LADBS data, I include information for both the total unpermitted units according to the census-assessor method and the percent of census households that are unpermitted in each block group.

Table 2. Descriptive Statistics

Variable	Block groups	Mean	Median	Std. Dev.	Min	Max
Unpermitted Units, 2010 (Census-Assessor)	2,493	19	9	56	-326	1035
Pct. Unpermitted Units, 2010 (Census-Assessor/Census)	2,493	3	2	9	-80	94
Pct. Vacant Units, 2010 (Census)	2,493	6	6	4	0	72
Density (1000 ppl. per sq. mile), 2010 (Census)	2,491	13	10	11	0	183
Pct. Own, 2013 (ACS 2009-2013)	2,493	42	38	29	0	100
Pct. Built After 2000, 2013 (ACS 2009-2013)	2,493	5	2	9	0	93
Pct. SFR Parcels, 2010 (Assessor)	2,493	41	32	34	0	100
Pct. ADU Permits (LADBS)	2,493	1	0	1	0	11

Sources: Author's research derived from U.S. Census Bureau, 2010 and the Los Angeles County Office of the Assessor; American Community Survey, 2009-2013; Los Angeles Department of Building and Safety

Case Study: Los Angeles

Southern California is central to scholarship on urban informality in the Global North. Mukhija & Loukaitou-Sideris's (2014) book on informality in the US highlights the various forms informality takes, and several of the contributions examine informality in the context of Southern California. Mukhija's (2014) study on unpermitted secondary units in Los Angeles was not the first to examine informal housing in Southern California, though it does take an important first step toward identifying and enumerating informal units within the city. This research estimates that unpermitted secondary units comprise around 50,000 households in Los Angeles, providing an excellent point of comparison for future enumerations of informal housing in the area.

Los Angeles is the second largest city in the United States, with almost four million residents. The scholarly focus on informal housing in Los Angeles results in part from the size of the city. But the city's urban form also makes it a relevant case study. The city is typically American, with an auto-centric, sprawling built environment. And like many other cities, it is caught in a housing crisis, with an insufficient supply of affordable housing to meet demand. A large proportion of Los Angeles's housing stock is made up of single-family housing: the half million single family homes account for one-third of all housing units in Los Angeles³, but around 70% of Los Angeles's urban land is allocated to low-density residential zoning (Manville et al., 2020). Low-density residential zoning has a long history in Los Angeles. Zoning restrictions in Los Angeles date back to 1908, but serious zoning restrictions in the latter part of the century limited the amount of land available in the city for large development projects. Environmental advocacy and anti-growth sentiment led to an expansion of low-density residential zoning across Los Angeles during the last quarter of the twentieth century (Whittemore, 2012). Restrictive zoning practices, like low allowable density, and high minimum lot size, parking requirements and building setbacks, lowered the overall population capacity of the city (Morrow, 2013). However, the low capacity did not prevent population growth. With low supply and high demand, housing prices in Southern California soared, inciting the current affordable housing crisis in the region.

Without access to affordable formal housing, many people live in informal housing. Known forms of informal housing in the city include unapproved units in multifamily buildings and unpermitted ADUs on single-family or duplex properties. In 2016, California legislators passed legislation overturning most local restrictions on ADU permits, making it easier for

³ Statistic computed from Los Angeles County Office of the Assessor data.

homeowners of single-family homes to get a permit to build a secondary unit on their property (California, Assembly Bill 2299 & Senate Bill 1069). The number of permits pulled for ADUs in Los Angeles rose from fewer than 100 per year to well over 1,000 per year. And a 2017 Los Angeles city ordinance responds to the demand for affordable housing by allowing landlords to legalize unpermitted dwelling units (Los Angeles, California, Municipal Code §184,907). Easing permit restrictions and enabling more homeowners to permit existing unpermitted structures should reduce the overall number of unpermitted units, assuming over-regulation was the primary driver of informal housing. But more research is necessary to understand the effect these housing policies will have on the prevalence of informal housing. A first step in that process is enumerating unpermitted housing units in the city at a geographic scale that allows for neighborhood level comparisons.

Results

According to the Los Angeles Office of the Assessor, the City of Los Angeles had 1.36 million residential units in 2010; according to the 2010 census, the same block groups had 1.41 million housing units combined. This suggests the City has around 49,000 unpermitted units, which is consistent with the 50,000 secondary units Mukhija (2014) estimated exist in the city.

The total difference in units for the city hides large variation by block group. Unit difference between census units and assessor units at the block group level ranges from -326 units (more assessor units than census units) to 1,035 units (more census units than assessor units). The percent of units that are uncounted range from -80% (where the number of additional assessor units is nearly two times the number of census units in the block group) to 94% (where the number of additional census units is nearly twice the number of assessor units in the block group). Figure 2 shows a histogram of percent unpermitted residential units in Los Angeles.

Most block groups have a higher residential unit count according to the census than the assessor: in 1,973 block groups, the census count is higher than the assessor count; in just 431 block groups, the assessor count of housing units is higher than the census count. There are 458 block groups with a difference of between -.05 and .05 percent difference in census and assessor residential unit counts.

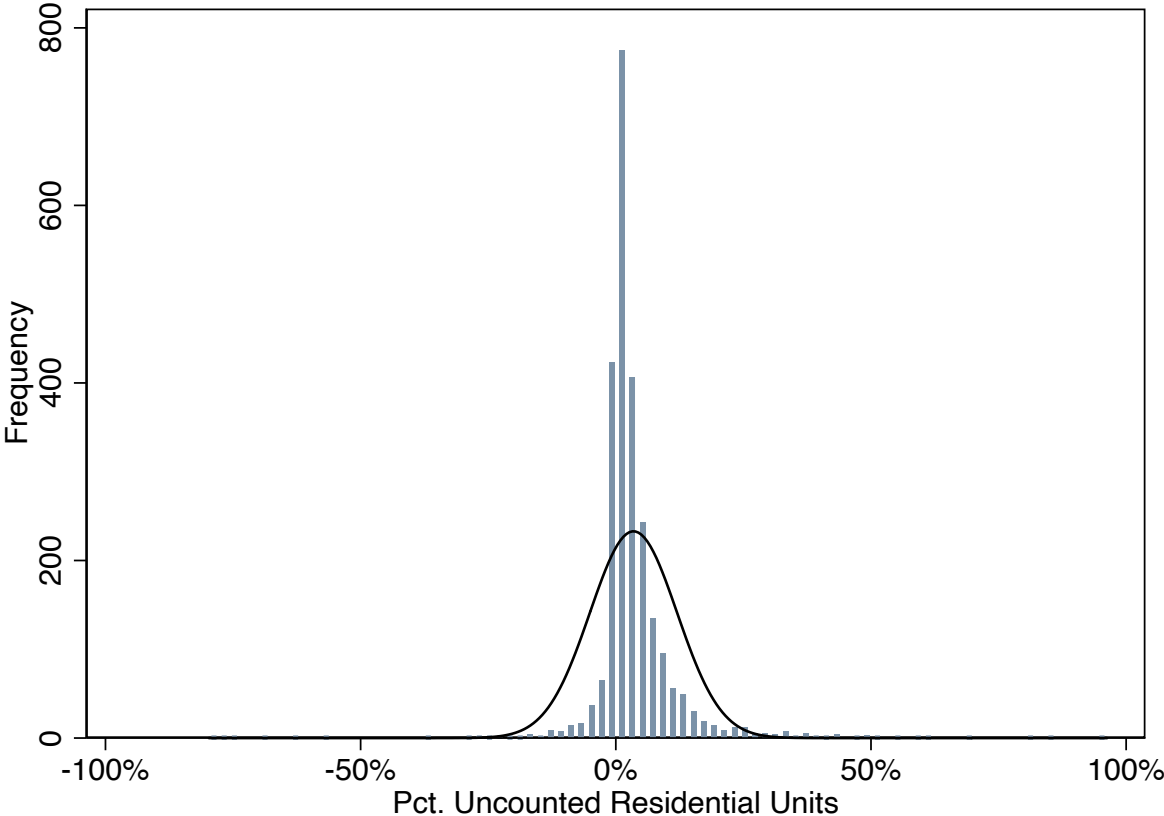


Figure 2. Histogram of Percent Uncounted Residential Units, 2010

Figure 3: *Percent Uncounted Residential Units by Census Block Group* shows the percent difference in census and assessor residential unit counts at the block group level across Los Angeles. Block groups with a higher share of assessor units than census units are spread across the city. Block groups with a high share of census units extend through the city, but those with the highest share are densely clustered in Downtown Los Angeles and the North Valley.

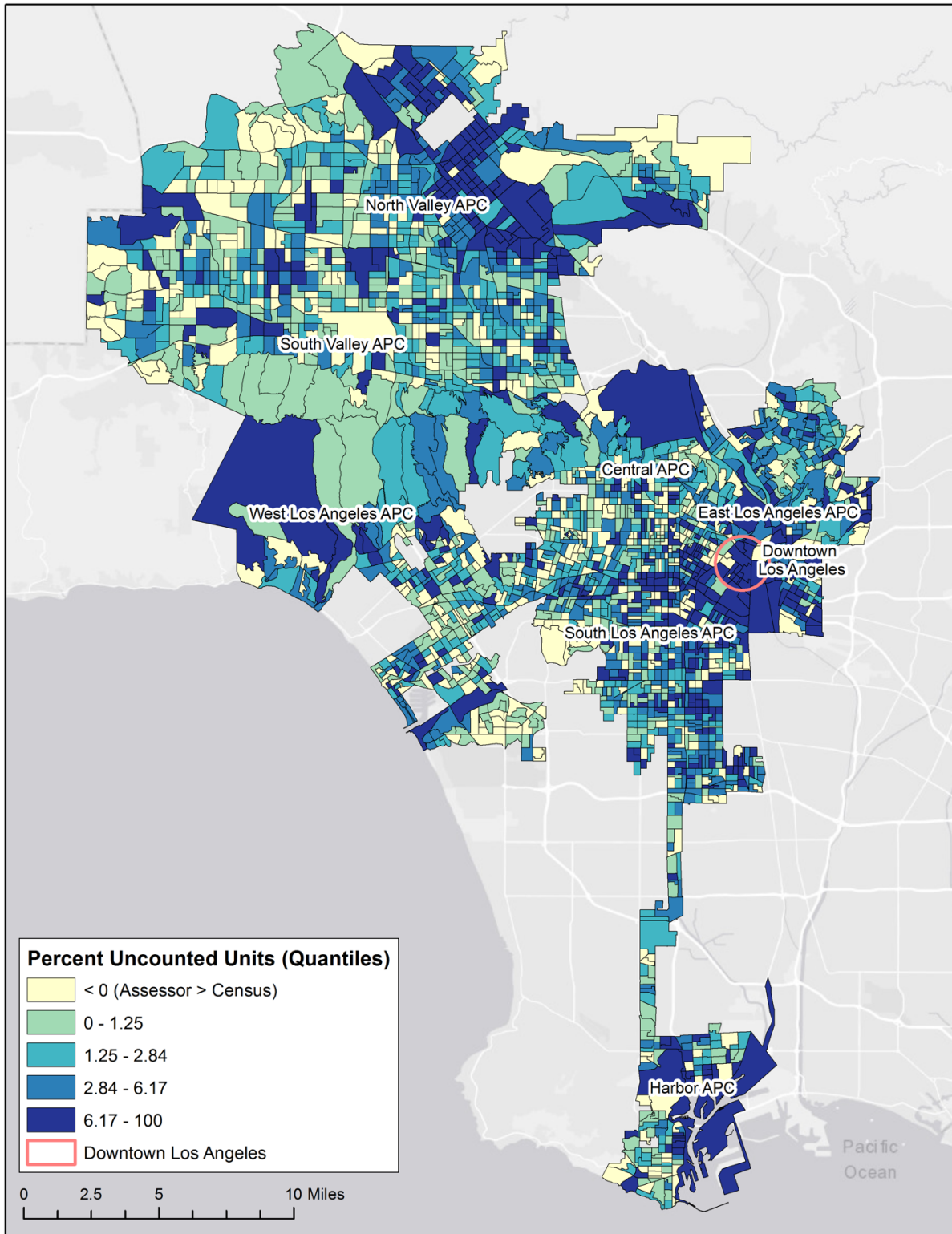


Figure 3: Percent Uncounted Residential Units by Census Block Group

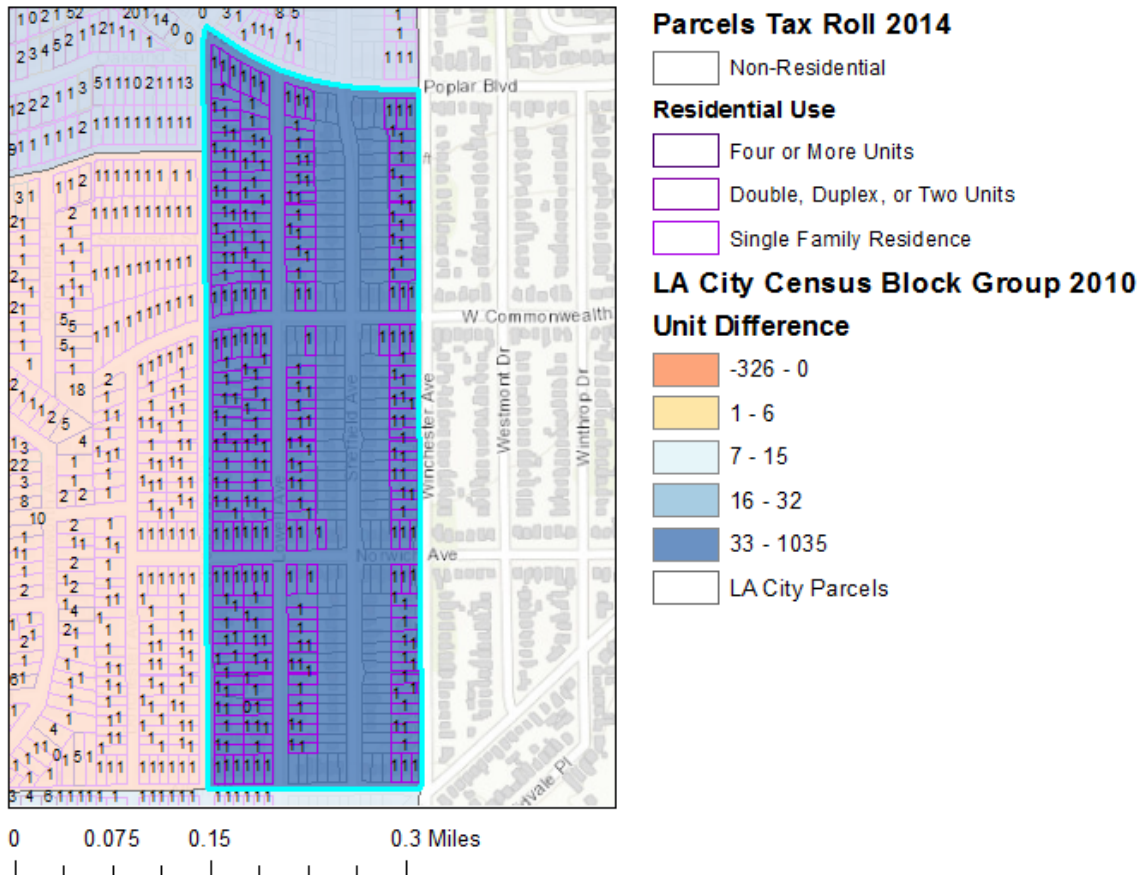
To assess the accuracy of the method, I analyze the results at the block group level across the city. I focus on block groups with high discrepancies between the census data and the assessor data. There are several situations in which assessor records do not accurately reflect the number of housing units on a property. The assessor's role is to assess the value of a property for tax purposes. In California, the state's constitution restricts changes to the assessed value so that assessment primarily occurs during a change of ownership, or for new construction. For new construction, the value of the property is based on the total cost of construction and the sale price of similar properties in the area. But for a change in ownership, property value is determined by the sale price. Taxable parcels constructed and assessed since records were digitized have the most accurate housing unit count. There are two types of parcels that are more likely to be inaccurate:

1) Government-owned parcels:

In the assessor database, government-owned parcels are frequently missing data, or the recorded data is incorrectly categorized. Government-owned subsidized housing projects are frequently categorized as "Other" rather than housing. This includes federal housing projects for low-income residents, federal housing for military families, and state housing for university students. Figure 4 shows a map of a block group in northeast Los Angeles where one entire street is missing permit data because the government owns the property. Residential units built or updated with a government subsidy, as in the case of Mills Act, which enables property owners with historic buildings to update or maintain their property, also tend to have incorrect housing unit numbers.

Conversely, there are a variety of non-residential government owned buildings that the assessor lists as residential parcels with housing units. This is particularly true for parks, fire

stations, libraries, and schools that were on properties where housing previously existed. There are many cases where these buildings are categorized as “Single Family Residence” or occasionally as “Multi-family residence” with housing units included.



Tract 2015.01, Block Group 2

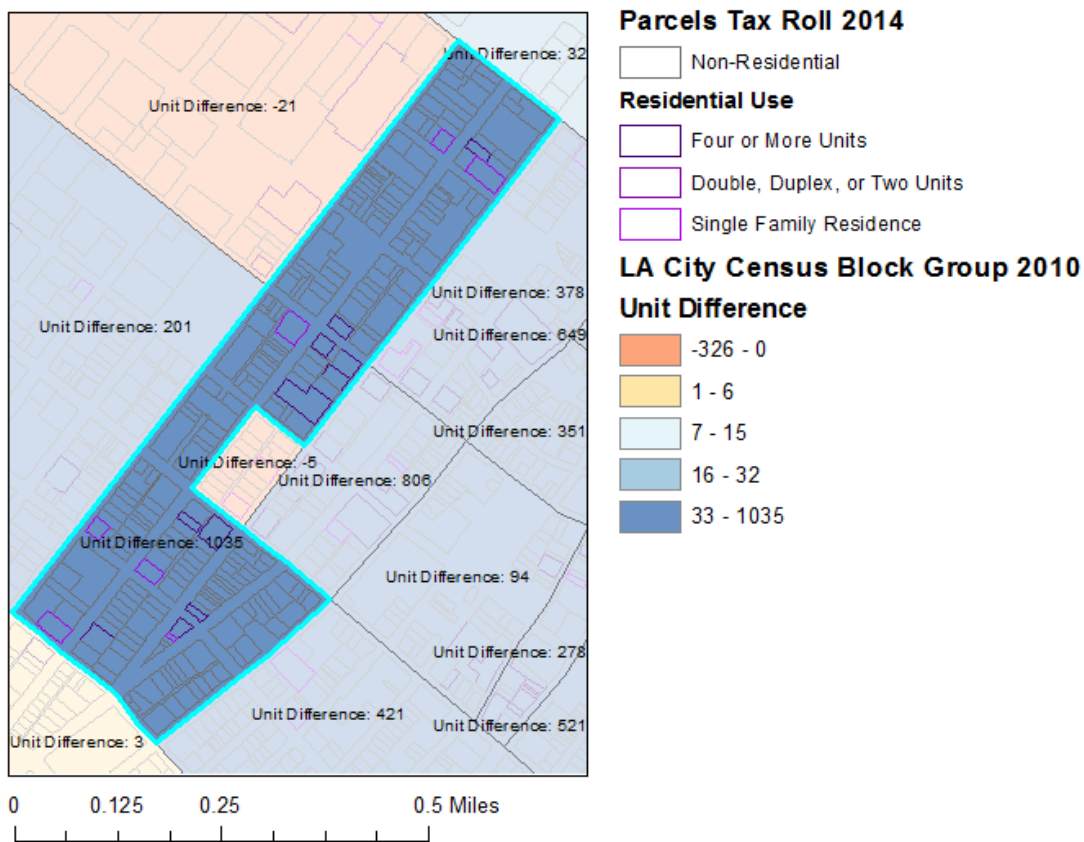
Census count: 377 units (361 occupied; 16 vacant)
 Assessor count: 248 units (248 single family)

Figure 4. Block Group in Northeast Los Angeles with Government-Owned Properties

2) *Parcels with multi-family buildings that predate digitization:*

Older multi-family buildings that have not required building permits since the assessor digitized the records are more likely to have flawed data. Park La Brea housing complex is an

example of how inaccurate the assessor data can be in cases such as these. In the case of Park La Brea, several parcels included a parking structure that was incorrectly listed as multi-family housing, dramatically increasing the total number of units for the entire complex. The assessor data notes the total number of units for the property as over 2,000 more than what the census counted for the property.



Tract 2073.01, Block Group 2

Census count: 3,048 units (2,532 occupied; 516 vacant)
 Assessor count: 2,013 units (0 single family)

Figure 5: Block Group in Downtown Los Angeles with Older Buildings

In some block groups, the Assessor undercounts the number of residential units in older buildings. In Downtown Los Angeles, many block groups include a combination of older and

newer buildings with a variety of uses. Figure 5 shows the block group with the largest positive difference in census and assessor residential unit counts. Fewer than a quarter of the buildings include residential units according to the assessor, and total 2,013 residential units. However, the census counts 3,048 residential units in the same area.

Not all problems in the parcel-census count fall into generalizable categories. There are some cases where it is difficult to identify the reason behind the difference between permitted and total housing units. These differences do not necessarily reflect the presence of informal housing, but data problems. In some cases, this results from housing units attributed to the wrong geographical area. In other cases, this stems from demolition and construction, with more or less units counted during the census than accounted for in the assessor data. A few cases likely result from derelict or vacant buildings appearing in one count but not in the other. However, the issues can also result from data entry issues; in one example, a single-story house in a low-density neighborhood with two to three dwelling units is listed as having 303 units.

Future research examining difference at the household rather than the block group level will provide more insight into both the number of unpermitted units in the city and the extent of the assessor data error. Comparing the average assessor overcount (19 more assessor units per block group) to the average census overcount (29 more census units per block group) suggests a very cautious estimate of unpermitted units in the city is closer to 25,000. However, previous estimates of unpermitted housing and estimates in other cities align more closely with the less cautious estimate of nearly 50,000 unpermitted units. For the purposes of the next section, I focus primarily on block groups where the census counts more residential units than the assessor.

Unpermitted ADUs

The census-assessor methodology enumerates all unpermitted housing in Los Angeles rather than capturing a specific type. In California, research on unpermitted housing is entangled with conversations about accessory dwelling units. I assess whether the measure of unpermitted units I use here might represent unpermitted ADUs by first comparing the results to Mukhija's (2014) findings and then looking at census block group level correlations between the unpermitted units and other housing variables.

According to Mukhija (2014), the three Area Planning Commissions (APCs) with the highest share of single-family home sales with unpermitted ADUs are Central, East LA, and South Valley. In Table 3, I compare the census-assessor method of measuring unpermitted units to the for-sale listings method and to ADUs in Los Angeles. I use the percent of sales with an unpermitted secondary unit, pulled directly from Mukhija (2014), and I calculate the results of the for-sale listing methodology as a percent of SFR parcels in each APC. I compare these to the percent of unpermitted units per SFR according to the census-assessor method and to ADUs as a percent of SFR parcels in the APC. Tallies from the for-sale listings method do not closely mirror tallies from the census-assessor methodology. Central has the largest share of unpermitted units according to both methods, and East LA also has a relatively large share according to both methods. West LA has a high share of unpermitted secondary units, both per SFR parcels overall and as a percent of SFR sales, but according to the census-assessor methodology, it has a smaller share of unpermitted units per SFR parcel than most other APCs. Instead, the census-assessor methodology finds a large share of unpermitted units per SFR parcels in Harbor APC, but this ranks last in the for-sale listing method. Interestingly, the APC with the largest share of ADU permits pulled between 2001 and 2018 was North Valley, closely followed by South Valley and

then Central. Central APC does appear to have a relatively large share of unpermitted secondary units according to the for-sale listings methods, unpermitted units according to the census-assessor method, and permitted ADUs.

Table 3. Unpermitted ADU Comparison by APC

Area Planning Commission (APC)	SFR Parcels, 2010	Unpermitted Secondary Unit (Mukhija, 2014)		Unpermitted Units, 2010 (Census-Assessor)	ADU Permits, 2001-2018 (LADBS)
		Pct. of SFR Sales	Pct. SFR	Pct. SFR	Pct. SFR
Harbor	22,312	3.7%	0.01%	11.8%	0.5%
Central	30,693	7.4%	0.10%	45.7%	1.5%
East LA	42,397	7.0%	0.04%	12.5%	1.1%
West LA	61,493	5.2%	0.05%	8.6%	1.0%
South LA	64,741	3.8%	0.03%	10.4%	1.3%
North Valley	111,437	3.3%	0.01%	7.5%	2.2%
South Valley	121,024	6.5%	0.04%	5.5%	2.0%

Table 4 shows correlations between the share of unpermitted units and ADUs per block group and housing variables at the block group level. ADUs are permitted on parcels with one single-family home, so unsurprisingly, block groups with a low density, more owners and more single-family homes have a larger share of ADUs per household. This also corresponds to a lower share of vacant units and older houses (units built before 2000). Block groups with high rates of unpermitted units are different from block groups with high rates of ADU permits. Block groups with more unpermitted units have a higher share of vacant units and recently built housing (units built between 2000 and 2013) and fewer homeowners and single-family homes. This suggests the majority of unpermitted units are not in the types of neighborhoods where ADUs are built; rather, unpermitted units tend to be in neighborhoods with more multi-family housing, suggesting a large share of the units are subdivided apartments rather than unpermitted ADUs.

Table 4: Correlation with Neighborhood Characteristics

	Pct. of Households with Positive Unpermitted Units (2,066 block groups)	Pct. Households with ADUs (2,066 block groups)
Pct. Vacant Units, 2010 (Census)	0.28***	-0.20***
Density (1000 ppl. per sq. mile), 2010 (Census)	0.07**	-0.29***
Pct. Own, 2013 (ACS)	-0.15***	0.43***
Pct. Built After 2000, 2013 (ACS)	0.15***	-0.12***
Pct. SFR Parcels, 2010 (Assessor)	-0.10***	0.55***

NS = no significance

*** p<0.0005, ** p<0.005, * p<0.05

Discussion: Enumerating Unpermitted Housing

The goal of this method is to enumerate unpermitted housing units across Los Angeles, and to determine whether this number represents unpermitted ADUs. This method has certain advantages compared to other methodologies for assessing unpermitted housing in Los Angeles. The major advantage is that it provides data across a whole city at the block group level. Previous enumeration methods in Southern California have been conducted either at a larger scale (multi-city) or with larger units of analysis (Area Planning Commissions) within the city. Results at the block group level allow for easy comparison with socioeconomic characteristics within the city.

This method also has limitations. While many studies focus on unpermitted ADUs in California, the positive correlation between the share of uncounted units and block groups with fewer homeowners and single-family homes suggests that the method pulls in a significant number of unpermitted subdivided apartments or additions to multi-unit buildings. This approach does not capture all informal housing that exists; rather, it captures the discrepancy that exists between census data and permit-data. Some of the difference can be marked up to measurement

or data error on either side. But the hidden nature of informal housing suggests that a more comprehensive measurement tool—and a broader definition of housing—is necessary for identifying all unpermitted housing. A visual analysis at the neighborhood level, as used by Kinsella (2017) in Hamilton, Ontario, would potentially allow researchers to identify a broader range of more transient units, like tents, RVs and campers, in addition to unpermitted ADUs and subdivided lots—though capturing subdivided multi-family units would be difficult. Measures of unpermitted housing at the block group level, as with the census-assessor method I employ, are not capable of identifying specific forms of informal housing, like unpermitted ADUs rather than multi-family subdivisions.

Given the flaws in the assessor data, similar flaws exist in the resulting enumeration of informal housing. However, this method is a useful stopgap measure for enumerating unpermitted housing units at the block group level across a whole city. Future research could address the flaws in the method and provide more accurate and detailed information about unpermitted housing by procuring access to restricted household-level data from the U.S. Census Bureau. While this data would not rectify problems in the assessor data, it would enable a more thorough examination of those data errors. But a household-level enumeration of unpermitted housing raises privacy concerns for the residents and could result in regulatory enforcement and fines.

Chapter 2: The Effect of Regulatory Changes on ADU Production in Los Angeles

In an effort to meet the ever-growing demand for affordable housing in the state, California implemented new legislation in 2017 to reduce local interference in the accessory dwelling unit (ADU) permitting process. The new legislation enables homeowners of a single-family house to more easily pull a permit to build an accessory dwelling unit (ADU) on their property. With nearly a half million single-family residential (SFR) parcels in Los Angeles, ADUs have the potential to significantly increase housing in the City. ADUs add to the housing supply low-density, single-family neighborhoods without significantly changing the architectural character of a neighborhood.

ADUs offer homeowners the opportunity to earn additional income by renting out part of their property, either as a long-term rental or to short-term tenants. High rental prices in a neighborhood should incentivize property owners to take advantage of those prices by constructing an additional housing unit to rent out. However, homeowner and neighborhood associations are powerful interest groups with the means to block growth, including ADU construction, particularly in middle- and high-income neighborhoods (Glaeser et al., 2005; Poorten & Miller, 2017). Economic theory suggests that reducing regulations that block ADU permitting should result in an increase in ADU permits, particularly in neighborhoods where the current supply of housing does not meet demand and results in high housing prices. Incentivized by those high housing prices, homeowners should take advantage of less stringent regulations by pulling permits to build ADUs on their property.

But ADUs are unlike other types of housing. First, not all homeowners are willing to share their private property with an additional resident, despite the incentive rent provides. And second, some homeowners build an ADU on their property to provide a semi-independent living space to family, friends, or caretakers. Proponents of ADUs frequently tout their role in enabling older homeowners to age in place rather than being forced into a retirement home as they become less capable of living independently (Chapman & Howe, 2001; Cobb & Dvorak, 2000; Lazarowich, 1991). Further, ADUs are not a new phenomenon in Los Angeles. As discussed in the first chapter, upwards of 50,000 unpermitted units already exist in the city, some of which are unpermitted ADUs (Mukhija, 2014). A large number of SFR parcels in Los Angeles already have a second unit on the property, constraining which properties will receive a permit for a new unit, as only one permitted ADU is allowed per parcel.

Current research on ADUs focuses on the many of the regulatory hurdles homeowners face in trying to build ADUs, as well as the potential drivers of ADU construction. The recent shift in regulations in California provides an opportunity to fill two gaps in the literature on ADUs. First, did the ADU regulations prevent homeowners from building ADUs in affluent neighborhoods more than less affluent neighborhoods prior to the regulatory change? Second, do economic incentives drive homeowners to construct ADUs more than non-monetary incentives?

Even with the many roadblocks preventing homeowners from pulling a permit for an ADU, homeowners pulled around 1,200 permits for ADUs between 2001 and 2016. The 2017 regulatory changes ended the stranglehold local neighborhood groups had on ADU construction. After California's new relaxed regulations took effect, the City of Los Angeles saw an increase of 2000% from 2016 to 2017 in the number homeowners that pulled ADU permits. The Los

Angeles Department of Building and Safety (LADBS) issued more than 2,200 in 2017 and over 4,000 in 2018.

This chapter uses the recent regulatory change to examine the motivations driving homeowners to pull permits for ADUs by looking at what neighborhood characteristics are associated with an increase in ADU permitting. I examine whether pre- and post-regulation permits are more strongly associated with high median rent or non-monetary neighborhood characteristics, like household, demographic, and geographic variables. ADUs are only allowed on parcels that have one other single-family residence, so the possible number of possible units varies greatly from block group to block group. I normalize the number of units across Los Angeles by taking pre- and post-regulatory ADU permits as a percentage of available single-family residential (SFR) parcels in a census block group.

I find that the average median household income for block groups with ADU permits rose following the regulatory change, suggesting middle- and high-income neighborhoods were more restrictive than lower-income neighborhoods prior to the regulatory change. However, relatively few homeowners in very high-income neighborhoods pulled permits for ADUs in either time period. And neighborhoods with a high share of ADU permits relative to the total number of SFR parcels are more likely to be lower income.

I find that median rent is less important than other non-monetary factors in determining where ADU permits are pulled. Median rent for block groups with permits rose slightly following the regulatory change; however, median rent in the neighborhood loses significance once non-monetary variables, like the rate of ownership and geographic location, are taken into account. In particular, the percent of households with non-relatives appears to factor into where ADU permits are pulled. In neighborhoods where people already share housing with non-related

individuals, like roommates and boarders, homeowners are more likely to get a permit to build an ADU.

Understanding Permitted and Unpermitted ADUs

The recent legislative changes enabled homeowners in Los Angeles to more easily pull permits to build an ADU on their property. This research explores ADU permitting at the neighborhood level, examining the characteristics associated with an increase in permitting following the regulatory change. Current research on ADUs considers how local land use regulations and building codes affect ADU construction (Anacker & Niedt, 2019; Antoninetti, 2008). ADUs are frequently discussed in the literature as an affordable and flexible housing option (Baer, 1986; Davis, 2018; Wegmann & Chapple, 2012), but some evidence suggests that ADUs built with permits differ in cost from those built without (Brown & Palmeri, 2014; Ramsey-Musolf, 2018). Past literature has examined where unpermitted ADUs are located and what socioeconomic characteristics are associated with their construction (Kinsella, 2017; Mukhija, 2014; Wegmann & Mawhorter, 2017). As yet, there is limited research that examines 1) how reducing regulations affects where ADUs are built within a city and 2) the difference between where permitted and unpermitted ADUs are built.

This review of the literature will first discuss what we know about how regulations affect the construction of ADUs and then cover what we know about the socioeconomic characteristics of neighborhoods that have higher rates of ADU permits.

Regulating ADUs

Land use regulations are neither inherently good nor bad. Land use planning arose out of a desire to discourage incompatible uses in close proximity, like having a noxious use next to a residential neighborhood. In some areas, like places where environmental hazards pose a threat to residents, regulations limit construction for safety reasons. In other areas, regulations correct market failures and provide social benefits (like increasing the amount of land available for roads) (Bertaud & Malpezzi, 2001). However, regulations increase the cost of construction (Glaeser & Gyourko, 2008; Glaeser & Ward, 2009) and act as a barrier to permitted construction. For ADU construction, regulatory hurdles include minimum parking requirements, restrictions in single-family zoning, and minimum lot size requirements, all of which restrict the number of homeowners who are able to build permitted units on their property (Anacker & Niedt, 2019; Antoninetti, 2008; Brinig & Garnett, 2013; Chapple et al., 2011, 2011; Mukhija, 2014; Pfeiffer, 2015; Wegmann, 2015). These regulations occur at the municipal level and frequently respond to fears of declining home values and changing neighborhood character (Infranca, 2014; Liebig et al., 2006). In response to a 2003 statewide effort to reduce local impediments in California, some municipalities responded by implementing ordinances to either limit where an ADU could be built or increase the cost of building one (Antoninetti, 2008; Brinig & Garnett, 2013). As a result, few homeowners built ADUs in these municipalities.

Another type of restriction occurs through NIMBY (not in my backyard) opposition to new housing development. Homeowner and neighborhood associations are powerful interest groups, with the means to block growth in their neighborhood (Glaeser et al., 2005; Poorten & Miller, 2017). During the last four decades in Los Angeles, homeowners implemented an anti-growth planning framework (Whittemore, 2012) and limited the land available for multifamily

housing projects (Morrow, 2013). Because limiting new housing units leads to housing scarcity and a price increase for existing housing, homeowners are incentivized to block new construction in their neighborhood (Monkkonen & Livesley-O’Neill, 2019; Monkkonen & Manville, 2019), including new ADUs. ADUs also stoke fears about the effects of increased density and an influx of renters in the neighborhood, leading some opponents to decry housing they believe would alter the character of the neighborhood (Mukhija, 2014).

Recent changes to California’s regulatory framework effectively shut down local restrictions by making ADU construction a use-by-right rather than conditional use permitting process. This means homeowners have the right to get a permit to build an ADU as long as they are in compliance with the state-wide standards, reducing the time and cost for homeowners who want to build an ADU and resulting in a surge of permits following the change. Even with these changes, there are still some restrictions on homeowners. For instance, minimum off-street parking requirements for single family residences still obstruct some homeowners from converting garages into secondary units on their property (Brown et al., 2017), a more cost-effective means of constructing an ADU than new construction. And regulations still exist to limit the size and position of the unit on the property, as well as to limit construction in environmentally hazardous areas.

Even with the recent regulatory changes, homeowners can spend a substantial amount building an ADU. On average, homeowners spend at least \$50,000 to build a unit, and some spend well over \$200,000.⁴ And as Wegmann (2015) points out, homeowners can have trouble financing ADU construction, as they are unable to borrow against the expected future earnings, and construction loans are difficult to secure for ADUs. A recent survey in Portland found that

⁴ Author’s research derived from Los Angeles Department of Building and Safety (LADBS) permit records in 2019.

45 percent of homeowners used cash savings to partially or fully finance ADU construction, and another 23 percent used a home equity line of credit (Gebhardt et al., 2018). Though permitting an ADU is easier now than prior to the regulatory changes, both permitting and construction are costly, and not all homeowners can afford to undertake this type of project.

The Importance of Unpermitted Housing

The difficulty of constructing permitted ADUs has led a large number of homeowners to construct unpermitted ADUs on their property. Estimates of the number of unpermitted units in Los Angeles range from about 50,000 to 200,000 (Brown et al., 2017; Mukhija, 2014). Research suggests that many unpermitted units are in good condition (Gellen, 1985; Mukhija, 2014), and homeowners might be able to get them up to safety and building codes for the permitting process relatively easily.

Unpermitted housing plays a unique role in the housing market. Goodbrand and Hiller (2018) point out that unpermitted secondary suites offer a type of flexible housing that the formal market is unable to provide. Their research finds that those who rent unpermitted secondary suites are likely to define themselves as in a transitional period in their lives. Renters may be drawn to these units because landlords impose fewer obstacles, like a credit or background check, in the rental process. Unpermitted units offer a flexibility in payment and tenure. Without a formal lease, renters can leave their situation quickly and easily (though they can also be evicted with no notice). Further, some research suggests that unpermitted secondary units are rented out at more affordable rates than permitted ADUs (Brown & Palmeri, 2014; Ramsey-Musolf, 2018). Rents for unpermitted units may be lower than permitted units because they are less likely to meet the quality standards required of permitted units and tenure is far less secure than it would be in a permitted unit. Under California law, a lease to rent an unpermitted unit is

unenforceable, making the rental process far less secure for both landlord and tenant. And any attempt at legal action by either the tenant or the landlord would potentially attract attention that would not benefit either party (a fine to the owner and eviction for the tenant). Baer (1986) notes that the “shadow market” (the informal housing market) produced more low-cost housing units in the 1980s than the formal market had. The unique role that unpermitted ADUs play in the housing market is unlikely to be completely replicated by permitted ADUs.

There are drawbacks for residents of unpermitted housing units. Flexibility for residents also translates to tenure insecurity. While many of the units in Los Angeles may be in good condition, no permit certifies that they were built with basic safety precautions in mind. Permitting these units would ensure the health and safety of its residents. However, little research currently exists on the formalization of unpermitted units in the Global North. A process now exists for property owners in Los Angeles to permit unpermitted units, but the process comes with costs. Property owners would only undergo a permitting process if the benefits of receiving the permits outweigh the costs.

Neighborhood Characteristics for ADUs

The literature suggests two related but different sets of motivations for building ADUs: the need for additional space in a home (Gellen, 1985; Hare, 1991) and the need for additional income for the homeowner (Rudel, 1984; Ruud & Nordvik, 1999). The first argument suggests ADUs are built for additional household space when the traditional housing structures no longer meet household needs. This motivation is exemplified by the work of AARP promoting ADUs as a model for elderly adults to age-in-place or for caretakers or adult children (Brinig & Garnett, 2013; Cobb & Dvorak, 2000; Hare, 1991). ADUs are smaller than most single-family homes, a more suitable size for a single individual or a couple than a large house (Infranca, 2014, 2016).

The second argument suggests that homeowners construct ADUs to supplement their income by renting out the ADU, by moving into the ADU and renting out the main house, or by living off-site and renting out both units (Chapple et al., 2011, 2017; Harris & Kinsella, 2017; Kinsella, 2017).

Given that ADUs are frequently described as an affordable, flexible option for renters (Baer, 1986; Davis, 2018; Wegmann & Chapple, 2012), and a means of increasing income and stabilizing neighborhoods for homeowners (Chapple et al., 2017; Cobb & Dvorak, 2000; Infranca, 2014, 2016), understanding which neighborhoods are most likely to see these benefits is important. Taking this further, advocates of zoning reform suggest that allowing for more diversity in housing could potentially lead to more class, race, and age diversity in neighborhoods (Brinig & Garnett, 2013). In high-income neighborhoods, new residents have access to more educational and job opportunities. But this claim has not been assessed in the literature on ADUs.

Research suggests a few key neighborhood-level socioeconomic and built environment characteristics associated with ADUs and unpermitted housing:

1) Homeownership rates and density:

As ADUs are a form of infill development added to single-family homes or duplexes, low-density neighborhoods generally have higher rates of ADUs. And given that single-family homes have higher rates homeownership, a high prevalence of ADUs should also correspond to high homeownership rates. At the city level in Southern California, informal housing production is associated with high homeownership rates and low density (Wegmann & Mawhorter, 2017). This indicates that the research measures more low-density informal housing, like unpermitted ADUs, than high-density informal housing, like informally subdivided apartments in multi-

family housing. However, informal construction accounted for a higher share of housing additions in higher density cities (Brown et al., 2017; Wegmann & Mawhorter, 2017), suggesting that informal housing production meets demand when formal construction is difficult and costly.

2) Income & rent:

ADUs are most prevalent in low-density neighborhoods with high rates of homeownership—features that are positively correlated with household income. Housing theory suggests that high rental prices incentivize construction of rental properties, like ADUs (DiPasquale & Wheaton, 1995). Areas with high rental prices should have a larger share of permits. However, the relationship between income and ADUs is not clear cut. Local homeowner and neighborhood associations restrict growth in many single-family neighborhoods. Residents in neighborhoods with high property values often resist housing development for fear that it will change the neighborhood character and depress property values (Antoninetti, 2008; Gabbe, 2018; Monkkonen & Manville, 2019; Poorten & Miller, 2017). In Phoenix, homeowners in high income neighborhoods adopted a strategy to preserve their single-family neighborhoods, limiting construction and use of second units; homeowners in low-income neighborhoods with high poverty rates felt threatened by second units, but had fewer ways of preventing growth in their neighborhoods. Homeowners in middle-income neighborhoods were most open to second units (Pfeiffer, 2015).

An increased home value might incentivize homeowners to build an ADU on their property. A Portland study demonstrates that an ADU contributed at least 25% of a property's appraised value (Brown & Watkins, 2012). However, this assertion has not been studied at a larger scale.

The research linking unpermitted units and household income is inconclusive. Some studies suggest that unpermitted secondary units are more likely in lower-income neighborhoods or cities, such as in Calgary (Poorten & Miller, 2017) or in a comparison of Southern California cities (Wegmann & Mawhorter, 2017). Other research finds that ADUs are slightly less likely in low-income areas, as in Los Angeles (Mukhija, 2014). Similarly, research on a sub-region of the East Bay (Wegmann & Chapple, 2012), finds a larger proportion of secondary units in higher-income neighborhoods.

3) Neighborhood diversity:

Ethnicity, race, and immigrant status are closely connected to income in North America, complicating the relationship between ADUs and neighborhood diversity. Single-family suburbs across the United States were frequently built with whites-only covenants (Rothstein, 2017), and segregation persists in many American cities. However, after accounting for this segregation of housing types, neighborhoods with high rates of racial and ethnic diversity respond with more leniency toward land-use and zoning concerns than less diverse neighborhoods, leading to higher rates of unauthorized or secondary units. In Calgary, unauthorized suites are more highly concentrated in immigrant and low-income neighborhoods (Poorten & Miller, 2017). And in a study of zoning regulations in Long Island, more liberal ADU regulations were associated with more diversity (though the causal relationship was unclear) (Anacker & Niedt, 2019).

4) Geography:

Geography shapes where housing is built in a city. The natural environment, with its amenities and constraints, and the built environment, with locational amenities, affect the demand and supply of housing (DiPasquale & Wheaton, 1995). Natural features, like steep-sloped terrain, curtail housing development (Saiz, 2010), and cities limit construction in many

areas due to the threat of environmental hazards. As of 2019, Los Angeles does not permit ADUs on parcels in a Very High Fire Hazard Severity Zone and it severely restricts permits in Hillside Areas (Los Angeles, California, Municipal Code §12.03 & §12.22), where there is an increased risk of fires or landslides.

Access to cultural amenities and employment might affect the presence of ADUs as well. Greater access to these human-made features increases housing prices in a neighborhood, encouraging homeowners to restrict the housing supply (Gabbe, 2018). However, high housing demand and the potential for more rental income incentivizes homeowners to build ADUs, either permitted or unpermitted, for rental purposes. The link between geography and the prevalence of ADUs has not been sufficiently explored in the literature.

5) Household structure:

Proponents of ADUs discuss the benefits of ADUs for non-traditional households (Infranca, 2014, 2016). Changing demographics suggests a need for more micro-unit housing available for a single or two individuals. This household structure includes elderly homeowners who wish to age-in-place or homeowners with elderly relatives (Chapman & Howe, 2001; Cobb & Dvorak, 2000; Lazarowich, 1991; Varady, 1990). ADUs present an opportunity for elderly individuals to live semi-independently with family, friends or caretakers living in close proximity. While many secondary units are used to house family members or friends (City of Beverly Hills, 2014; Wegmann & Chapple, 2012), the literature does not identify household type census characteristics associated with the presence of ADUs.

Little research has been done on where permitted ADUs are relative to unpermitted ADUs. Most research on neighborhood socioeconomic features occurs at the municipal level and looks at what types of cities have more permissive regulations. While the causal effect remains

unclear, generally more diverse, medium-income communities are more likely to have more permissive ADU legislation (Anacker & Niedt, 2019) or more flexible attitudes toward the role that ADUs play in the community (Pfeiffer, 2015). The literature suggests two motivations drive homeowners to build ADUs: the need for additional space (Gellen, 1985; Hare, 1991) or the need for additional income (Rudel, 1984; Ruud & Nordvik, 1999). However, beyond theorizing about these two drivers, little has been done to assess the extent to which these drivers affect rates of permitting.

Methods and Data

Two primary motivations drive homeowners to build ADUs: a desire for additional space and/or additional income. Though high rents incentivize homeowners to construct ADUs as rental properties, local neighborhood and homeowner associations restrict construction in low-density, high income neighborhoods. Recent regulatory changes ended most local control over ADU permitting, enabling homeowners to more easily pull permits for ADUs in California.

Following the recent changes in state-wide regulations, the number of ADU permits tripled in two years over what it had been for the 15 years prior. To understand whether the regulatory change also changed where these permits are in the City, I combine permit data from the City of Los Angeles with census block group data to describe the neighborhoods that have the most permits of each type. I divide the permit data into two categories: pre-regulation permits (permits pulled between 2001 and 2016) and post-regulation permits (permits pulled in 2017 and 2018). In addition to comparing the total number of permits, I examine the permits as a proportion of available SFR parcels in the block group.

Equation 1. GLM model of ADU permits

$$\frac{\text{Permits}_{\text{year1}}}{\text{Available SFR Parcels}} = \alpha + \beta_i \mathbf{Regulations} + \beta_i \text{Ownership} + \beta_i \text{Rent} +$$

$$\beta_i \text{Need for Space} + \beta_i \text{Neighborhood} + \beta_i \text{Geography} + \varepsilon_i$$

≠

$$\frac{\text{Permits}_{\text{year2}}}{\text{Available SFR Parcels}} = \alpha + \beta_i \text{Ownership} + \beta_i \text{Rent} + \beta_i \text{Need for Space} +$$

$$\beta_i \text{Neighborhood} + \beta_i \text{Geography} + \varepsilon_i$$

Scale

Census block groups are the primary unit of observation and a stand-in for neighborhood in this research. Census block groups are subdivisions of census tracts and generally contain between 600 and 3,000 people. While census blocks are the smallest unit of analysis, data from the ACS at the block group level is more reliable, and they are a closer approximation to a neighborhood than Census blocks (Sperling, 2012).

Block groups are statistically defined areas, and the boundaries are arbitrary, so they do not perfectly represent neighborhoods. Nor are they a stand-in for housing sub-markets. However, for the purpose of analyzing the socioeconomic data in a region, block groups offer more precision than larger statistical samples like census tracts, as they offer insight into subregions of a city.

One limitation of analyzing permits at the scale of the block group rather than the household level is that it allows more room for the threat of ecological fallacy. In other words, information generalized to the block group level does not apply to all individuals or households

in the block group. Thus, my findings about block groups are not true for individual households within the block group.

Data

Post-regulation permits (Permits from 2017 – 2018): Los Angeles Department of Building and Safety (LADBS) maintains a record of all building permits in the City of Los Angeles. Starting in 2013, the City began coding building permits for accessory dwelling units (ADUs). This file includes the Assessor Identification Number (AIN) for each parcel. Using the AIN, I match the permits to the geocoded assessor parcel data from 2011, and code it by year the permit was issued. I collapse all the assessor data by block group, and I combine the resulting annual permit totals into pre- and post-regulation variables. The relevant regulatory change occurred at the start of 2017, so totals from 2017 and 2018 are the post-regulation permit variable. This totals 6,256 permits across 1,611 block groups.

Pre-regulation permits (Permits from 2001 – 2016): Prior to the middle of 2013, LADBS did not identify permits for ADUs in the city as such. However, because there were already several regulations in place to ease the permitting process for homeowners who wanted to build an ADU on their property, it is possible to identify many units based on the language used in the permit description. By narrowing the search to records permitted as “1 or 2 Family Dwelling”, it is possible to identify accessory dwelling units through key words and phrases like “conversion”, “garage”, “second unit”, “Accessory”, and “AB 1866”. However, these words can capture more than just accessory dwelling units, so carefully filtering records for those that have multiple key words is important. I also remove records that specify the use type as Accessory Living Quarter (ALQ), as these are not complete units (generally lacking a kitchen). After deduplicating the records, I can link the resulting 1,016 records for permits for ADUs between

2001 and 2013 to the geocoded assessor data using the AIN and follow the same process I use for the 2013 to 2018 data. Once I collapse the data by block group, I combine annual total from 2001 to 2016 into the pre-regulation permit variable. This totals 1,193 units across 692 block groups.

Available Single-Family Residential (SFR) Parcels: Permits for ADUs are limited to those parcels zoned for residential use and have only one existing single-family unit already. I use data from the Los Angeles County Office of the Assessor to capture two variables of interest in creating the number of available SFR parcels in Los Angeles. First, I capture units missing from the Assessor database as an approximation of unpermitted housing units in the city. I base my methodology for locating unpermitted units on a combined methodology, pulling from Wegmann & Mawhorter (2017) and Poorten & Miller (2017). By connecting assessor parcel data to census block groups in ArcGIS, I combine the number of assessor-counted parcels at the block group level. I compare units from the county's Assessor database to the census units at the block group level. According to the Los Angeles County Assessor, the City of Los Angeles has 1.36 million residential parcels across 2,506 block groups. In comparison, the census accords 1.41 million housing units to the region, for a difference of approximately 49,000 units. To contend with the issue of over- and under-counting in the Assessor records, I ignore negative differences, where the census counts fewer units than the Assessor, and I drop block groups with no SFR parcels. In the remaining 1,892 block groups, there are 49,149 uncounted units. Given that many of these units are in majority multi-family residential areas, the tally of uncounted units includes unpermitted units in multi-family buildings in addition to unpermitted ADUs. I account for this by determining the proportion of all housing units (according to the Census) that are uncounted. I then estimate the number of available SFR parcels per block group by multiplying the proportion

with the total number of SFR parcels in each block group. The resulting number is an approximate number of available SFR parcels per block group.

To account for the number of available parcels in the measurement of ADU growth, I create two new permit variables: the proportion of pre-regulation permits in available SFR parcels, and the proportion of post-regulation permits in available SFR parcels.

Equation 2. Available SFR Parcels

$$\text{Available SFR Parcels} = \text{SFR Parcels}_{\text{Ass.2011}} * \frac{(\text{Total HH}_{\text{Cen.2010}} - \text{Res Parcels}_{\text{Ass.2011}})}{\text{Total HH}_{\text{Cen.2010}}}$$

Neighborhood variables: I examine ADU permits in relation to neighborhood level characteristics based on the literature. These include density variables, economic variables, household variables, demographic variables, and geographic variables. I combine variables from the 2010 decennial census and the 2013 5-year estimates from the American Community Survey (ACS) for socioeconomic and housing characteristics at the block group level. The 2009-2013 data was the first 5-year dataset available from the ACS; I use this data rather than more recent ACS data because the permits were pulled over an 18-year period and this data falls in the middle of that time span. In Table 5, I record the expected relationship between the socioeconomic and geographic variables and the ADU permits.

Previous studies have looked at homeownership and ADUs, so I include percent homeownership as a variable. In Los Angeles, the percentage of housing occupied by homeowners is highly positively correlated with the proportion of SFR parcels in a block group. I expect a similar positive relationship between ADU permits and percent ownership in the block group.

To approximate the need for more space as a driver of ADU construction, I use two household variables: percent of households with non-relatives and percent of the population aged over 65. Households with non-relatives includes both family and non-family households that include a boarder, roommate, unmarried partners, and foster children. I expect a positive relationship between ADU permits and one or the other household variable if the need for more space is a driver of ADU construction. To approximate a need to generate income, I include median rent for the block group. High rents incentivize homeowners to build rental units, so I expect a positive relationship between median rent and post-regulation ADU permits. ADU construction also requires financial resources, so I include median household income. I expect a negative or no relationship with pre-regulation permits, but a positive relationship with post-regulation ADU permits.

High racial and ethnic diversity in a neighborhood is sometimes associated with more lenient housing policies in the neighborhood. To consider neighborhood leniency, I include two demographic variables: percent Hispanic and percent Black. I expect a positive relationship with one or both variables and pre-regulation permits. However, post-regulation permits no longer have local regulatory hurdles to overcome, so I do not expect a positive relationship between racial/ethnic variables and post-regulation permits.

Geography shapes where people build in a city, so I include several geographic features in this analysis. ADU construction is restricted in Hillside Zones, so I note block groups in these areas. Because ADUs are restricted in these areas, I expect a negative relationship with ADU permits. Further, I consider the block group's proximity to downtown and to the ocean.

Table 5. Expected Relationship Between Variables

Category of Determinant	Variable	Expected Relationship with Pre-Regulation ADU Permits	Expected Relationship with Post-Regulation ADU Permits
Ownership	Pct. Owner	Positive	Positive
Economic	Median HH Income	Ambiguous	Positive
	Median Rent		
Household	Pct. Households with Non-Relatives	Positive	Positive
	Pct. Population over 65		
Demographic	Pct. Black	Positive	Ambiguous
	Pct. Hispanic		
Geographic	Distance to Downtown	Negative	Negative
	Distance to Coast		
	Hillside Zone		

Table 6 shows the descriptive statistics for each variable at the block group level. Of the 2,522 block groups in Los Angeles, 2,377 have SFR parcels. Because ADUs can only be built on single-family parcels, I drop block groups with no SFR parcels. Not all variables have data available for all block groups. For instance, both percent ownership and percent population over 65 only have data available for 2,372 block groups. For median rent, I pulled some variables from the tract rather than the block group level, as data is not available for all block groups. Both median income and median rent are described in terms of \$1,000 to more closely align the values with other variables. Thus, rather than ranging from \$5,000 to \$250,000 dollars, median income ranges from \$5 to \$250.

Table 6. Descriptive Statistics

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
Pre-Regulation ADU Permits 2001-2016 (LADBS)	2,377	1	0	1	0	11
Post-Regulation ADU Permits 2017-2018 (LADBS)	2,377	3	2	3	0	23
Pct. Available SFR Parcels with Pre-Regulation Permits (%) (LADBS/Census 2010/Assessor 2011)	2,377	0	0	1	0	15
Pct. Available SFR Parcels with Post-Regulation Permits (%) (LADBS/Census 2010/Assessor 2011)	2,377	1	1	2	0	33
Pct. Owners (%), 2013 (ACS 2009-2013)	2,372	43	39	28	0	100
Med. Household Income (\$1,000), 2013 (ACS 2009-2013)	2,377	59	50	35	5	250
Med. Rent (\$1,000), 2013 (ACS 2009-2013)	2,377	1	1	0	0	2
Pct. Households with Non-Relatives (%), 2010 (Census)	2,377	19	19	6	0	69
Pct. Population over 65 (%), 2013 (ACS 2009-2013)	2,372	19	17	11	0	100
Pct. Black (%), 2013 (ACS 2009-2013)	2,373	10	3	17	0	97
Pct. Hispanic (%), 2013 (ACS 2009-2013)	2,373	47	46	30	0	100
Distance to Downtown (miles)	2,377	11	9	7	0	26
Distance to Coast (miles)	2,377	11	11	5	0	21
Hillside Zone	2,377	0	0	0	0	1

Sources: Los Angeles Department of Building and Safety (LADBS); author's research derived from U.S. Census Bureau, 2010 and the Los Angeles County Office of the Assessor; American Community Survey, 2009-2013; author's research derived from City of Los Angeles GIS shapefiles

Methods

ADUs are restricted to single-family residential (SFR) parcels with only one existing single-family housing unit on the property. I first analyze total permits per block group, differentiating between pre-regulation permits and post-regulation permits by examining the difference in means between the two groups with z-tests. However, ADUs are restricted to SFR parcels and the attributes reflect the attributes of SFR parcels more generally. Thus, I also analyze where ADU permits are taken out relative to the number of SFR parcels available for

permitting. I examine ADU permits as a percentage of available SFR permits at the Census block group level. Following Papke & Wooldridge (1996) and Baum (2008), I run a generalized linear model with a logit link and a binomial family for the proportional dependent variable. This method captures proportion data that includes zero and one as values. For the purpose of this research, block groups with zero ADUs per SFR parcel are just as important to understanding permitting patterns as block groups with permits. To standardize the results, I report the results as exponential coefficients. I run two models on both dependent variables, with and without controls approximating the need for space.

Los Angeles as a Case Study

The City of Los Angeles is an important case study for examining how the recent regulatory changes affect the permitting of ADUs for several reasons. First, several studies have tried to enumerate the number of unpermitted units in Southern California and in Los Angeles specifically. These offer a good base of comparison for this research project. Second, Los Angeles is a large city, with over 3.5 million inhabitants, and has diverse socioeconomic neighborhoods within its boundaries, but it also has nearly one half million single-unit, SFR parcels eligible for an ADU. The City is unique in the number of parcels eligible for an ADU, but also reflects a low-density built environment emblematic of many American cities. It has also seen a huge increase in the number of permits, rising from fewer than 200 in 2016 to over 2,000 in 2017.

Results

For this research, I examine pre-regulation permits and post-regulation permits as two separate categories and consider each in relation to socioeconomic and geographic characteristics

at the block group level. I first look at the difference between the two groups of permits as a whole before I consider the permits as a proportion of available SFR parcels.

Pre-Regulation vs Post-Regulation Permits

Following the recent changes in state-wide regulations, the number of ADU permits tripled in two years over what it had been for the 15 years prior. To understand whether the regulatory change also changed where these permits are in the City, I compare permits from 2001 to 2016 (pre-regulation permits) to permits from 2017 and 2018 (post-regulation permits) at the block group level.

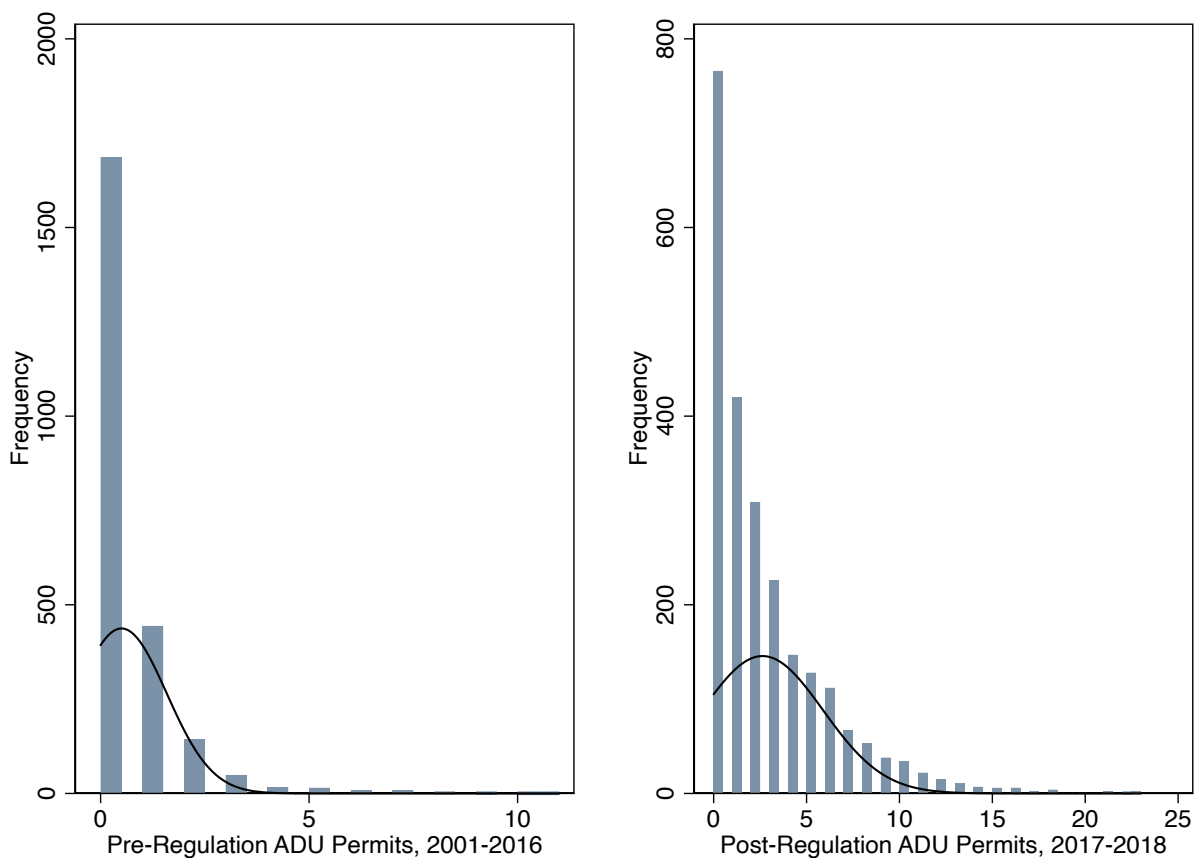


Figure 6. Histogram of ADU Permits in Los Angeles

Between 2001 and 2018, nearly 7,500 permits were pulled for ADUs. Figure 6 shows a histogram of ADU permits for each time period. Only 692 block groups have one or more of the 1,193 pre-regulation permits, and most block groups with pre-regulation permits have only one permit. Only a third of block groups with a pre-regulation permit have two or more permits. The 6,256 post-regulation permits are spread across 1,612 block groups and have a large share of block groups with two or more units.

Figure 7 shows a map of ADU permits at the block group level divided by year the permit was taken out, and block groups with a large share of permits are cross-hatched. The majority of block groups are green, designating permits taken out just in 2017 and 2018, but a sizable share of block groups contain both types of permits, as shown in blue. Far fewer block groups are orange, the color identifying block groups with only pre-regulation permits. While the pre-regulation permit block groups are scattered across the city, a slightly larger share are close to Downtown Los Angeles. Block groups without any permits are shown in white. The largest share of these block groups are concentrated in Downtown Los Angeles, an area with relatively few SFR parcels.

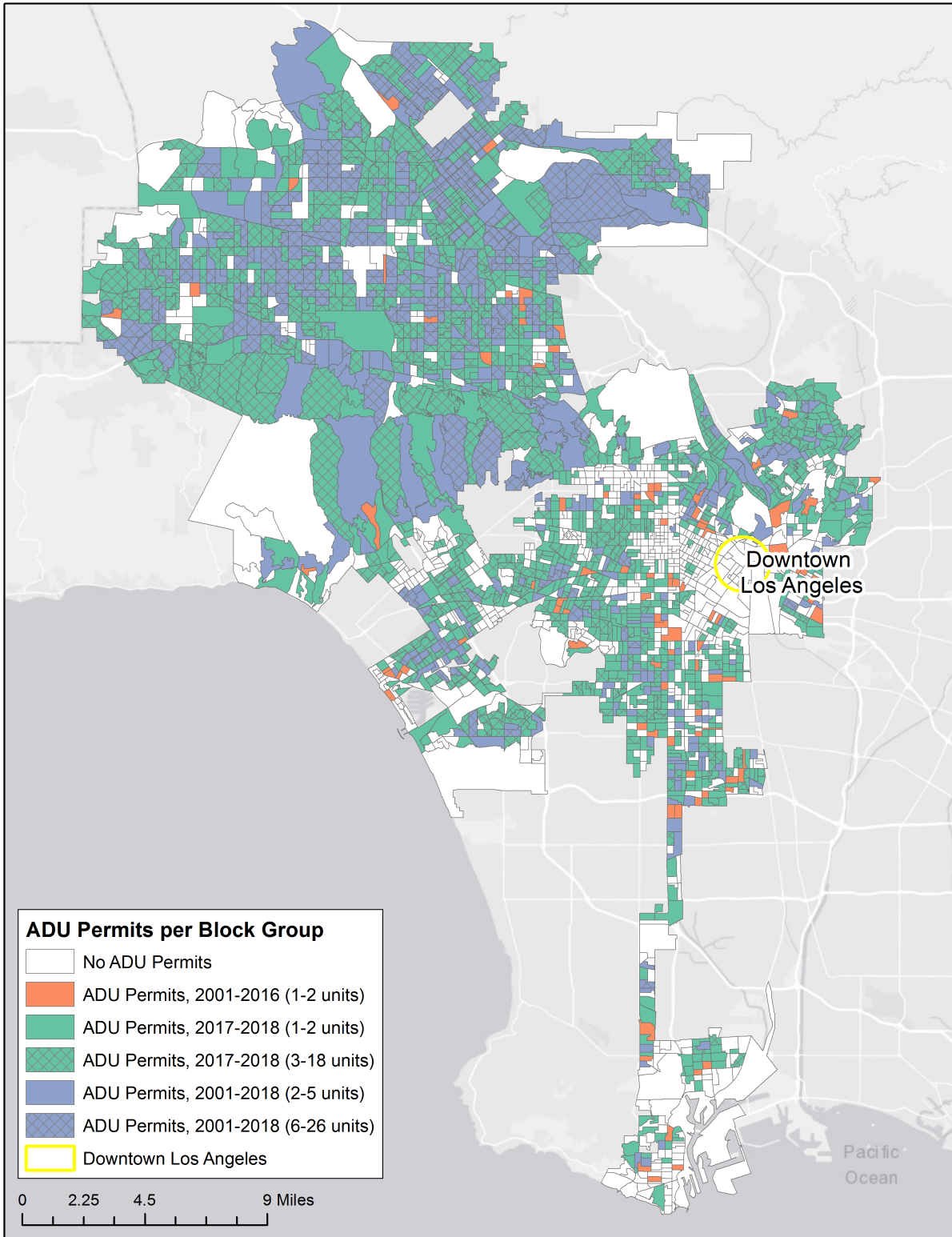


Figure 7. Block Groups by Permit Year and Number of Units

As seen in Table 7, there is significant overlap between the two groups: a quarter of all block groups in the City of Los Angeles have both pre-regulation and post-regulation permits, and almost 90% of the pre-regulation permits are in these block groups. But less than half of all post-regulation permits are in the block groups (though they account for just under half of the post-regulation permits). With 587 SFR parcels per block group, these block groups have more SFR parcels on average than block groups with only pre-regulation or only post-regulation permits.

There is a wider distribution of post-regulation permits, with over half of all post-regulation permits spread across 1,025 block groups without pre-regulation permits. On average, these block groups have fewer SFR parcels, with only 227 per block group. There are far fewer block groups with only pre-regulation permits (105 block groups), and these block groups have fewer SFR parcels on average as well (107 per block group).

Table 7. Block Groups by Presence of ADU Permits

	No permits	Pre- & post-regulation permits (2001-2018)	Pre-regulation permits only (2001-2016)	Post-regulation permits only (2017-2018)
Block groups	661	587	105	1,025
Number of permits	0	3,999	121	3,329
Total SFR parcels	57,696	162,955	11,210	232,170
Available SFR parcels	49,920	149,831	9,482	218,171
Average SFR parcels per block group	87	587	107	227

A dissimilarity index is commonly used to assess the level of demographic segregation in cities. The higher the dissimilarity score, the more segregation in the city. I measure the dissimilarity of pre-regulation permits and post-regulation permits to SFR parcels at the block group level. Pre-regulation permits and SFR parcels have a high dissimilarity score of 0.653,

whereas post-regulation permits and SFR parcels have a moderate score of 0.362. The dissimilarity scores show that post-regulation permits are far more evenly distributed across the city than pre-regulation permits. The large difference between dissimilarity scores results in part from a difference in sample sizes, as far more block groups have post-regulation permits than pre-regulation permits. However, the low score for post-regulation permits suggests they are distributed similarly to SFR parcels generally. In comparison, the dissimilarity score is much higher for both sets of permits relative to multi-family residential parcels. Pre-regulation permits and multi-family parcels have a high dissimilarity score of 0.789 and post-regulation and multi-family parcels have only a slightly lower score of 0.682. ADU permits are far less frequent in block groups with high rates of multi-family housing than block groups with single-family housing.

Table 8. Difference in Means Between Pre-Regulation and Post-Regulation Permits at Block Group Level (Weighted by ADU permits)

	Blocks groups with pre-regulation permits <i>N</i> =692		Block groups with post-regulation permits <i>N</i> =1,612		Z test	Effect size
	Mean	SD	Mean	SD		
Pct. Owners (%)	51.87	24.76	57.29	23.68	-4.87***	0.22
Med. Household Income (\$1,000)	60.27	32.06	65.44	31.88	-3.55***	0.16
Med. Rent (\$1,000)	1.34	0.36	1.40	0.38	-3.50***	0.16
Pct. Households with Non-Relatives (%)	19.57	5.36	17.82	5.20	7.18***	0.33
Pct. Population over 65 (%)	18.87	10.08	20.49	9.98	-3.55***	0.16
Pct. Black (%)	6.51	11.75	7.37	14.14	NS	0.07
Pct. Hispanic (%)	55.48	29.34	44.67	28.63	8.16***	0.37
Distance to Downtown (miles)	13.97	5.97	13.75	6.01	NS	0.04
Distance to Coast (miles)	12.48	4.46	11.76	4.46	3.56***	0.16

NS = no significance

*** $p < 0.0005$, ** $p < 0.005$, * $p < 0.05$

Table 8 shows the difference in means of the selected socioeconomic variables between pre-regulation permits and post-regulation permits. On average, block groups with pre-regulation ADU permits have lower rates of ownership and lower median household income and median rent than block groups with post-regulation permits. The percent of households with non-relatives is higher for block groups with pre-regulation permits than for block groups with post-regulation permits, but the average percent of the population over 65 is lower for pre-regulation permits than post-regulation permits. Although there is no significant difference in the percent of the population that is Black between the two groups of permits, the average percent Hispanic is higher for pre-regulation permits than post-regulation permits. Finally, while distance to downtown does not differ significantly between pre- and post-regulation permits, pre-regulation permits tend to be further from the Coast on average than post-regulation permits.

While the mean median household income for ADU permits rose following the regulatory changes, the highest-income block groups do not have the largest share of post-regulation permits. Figure 8 shows the share of pre- and post-regulation permits by income quantile. Quantile three, with median household incomes between \$41,941 and \$56,910, has the largest share of pre-regulation permits at 30% of the total. The largest share of post-regulation permits is in quantile four, with median household incomes of between \$56,911 and \$79,199. This quantile also saw the largest change between pre- and post-regulation permits, with just 23% of pre-regulation permits in this quantile, compared to 30% of post-regulation permits. Quantile five, with median incomes between \$79,200 and \$250,000+, saw an increase in the share of permits following the regulatory change, and accounted for 24% of post-regulation permits.

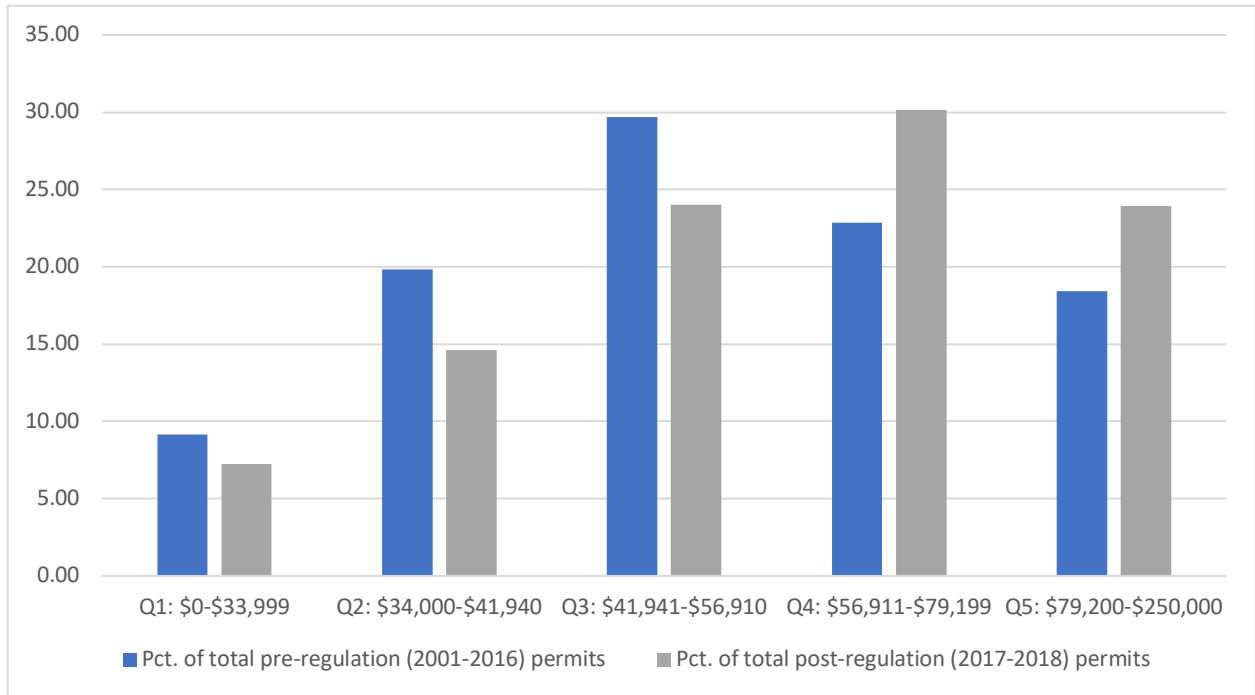


Figure 8. Share of Pre- and Post-Regulation Permits by Income Quantile

Accounting for SFR Parcels

To receive a permit to build an accessory dwelling unit on a property in Los Angeles, a homeowner must have a parcel zoned for single- or multi-family dwellings with only one other unit on the property. This suggests a low-density urban form, with few housing units per block group. Unsurprisingly, there are more ADUs in block groups with high numbers of single-family residential (SFR) parcels—the type of residential parcel where ADUs are allowed. The attributes of the block groups where homeowners have pulled ADU permits reflect the attributes of SFR parcels overall. In order to see neighborhood characteristics of ADU permits beyond the attributes of SFR parcels, I examine the number of permits relative to the number of available SFR parcels in the block group. But not all SFR parcels are available for a new permit. If a parcel already has one ADU (permitted or unpermitted), the homeowner does not satisfy the requirements for an additional ADU. As of May 2017, a process exists for homeowners to permit

a previously built unpermitted unit in Los Angeles, but few landlords appear to have taken advantage of the ordinance so far.

Table 9 reports the results of a generalized linear model with a logit link and a binomial family for both pre-regulation and post-regulation permits as a proportion of available SFR parcels. I run two regression models for each dependent variable. The first two models only have economic variables, and the second two models include all variables (ownership, economic, household, demographic, and geographic variables).

Table 9. Results of GLM Reported as Exponential Coefficients

	(1)	(2)	(3)	(4)
	Economic Variables		All Variables	
	Pre-Regulation Permits (2001-2016)	Post-Regulation Permits (2017-2018)	Pre-Regulation Permits (2001-2016)	Post-Regulation Permits (2017-2018)
Pct. Owner (%)			0.33***	1.68**
			(-3.85)	(2.92)
Median HH Income (\$1,000)	0.98***	0.99***	1.00	1.00**
	(-5.38)	(-6.67)	(0.23)	(-3.15)
Median Rent (\$1,000)	1.47	1.46***	1.38	1.01
	(1.78)	(4.05)	(1.57)	(0.08)
Pct. HH with Non-Relatives (%)			35.17**	22.91***
			(3.17)	(3.90)
Pct. Over 65 (%)			0.90	0.70
			(-0.16)	(-1.18)
Pct. Black (%)			1.74	0.74
			(1.51)	(-1.73)
Pct. Hispanic (%)			3.58***	0.65***
			(5.64)	(-3.41)
Distance to Coast (miles)			1.07***	1.05***
			(6.24)	(9.07)
Distance to Downtown (miles)			1.04***	1.02**
			(5.37)	(3.17)
Hillside Zone			0.52***	0.42***
			(-3.98)	(-9.02)
Observations	2,377	2,377	2,370	2,370

Exponentiated coefficients; t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Income and Rent

Block groups with a large share of either pre-regulation or post-regulation ADU permits per available SFR parcel tend to have low median household incomes (as shown in models 1 and 2). This contrasts with findings for ADUs as whole, as demonstrated in Figure 8: a large number of both pre-regulation and post-regulation permits are in block groups with middle to high income households. But these block groups also have a much larger number of available SFR parcels than block groups with low median household incomes. After factoring in additional variables in models 3 and 4, median household income is not a significant factor for block groups with pre-regulation permits, and there is only a slight negative relationship with post-regulation permits.

The first two models demonstrate a change in the relationship between median rent and ADU permits following the regulation change. Holding median household income constant, block groups with a large share of post-regulation permits are more likely to have high median rents; the same is not true for pre-regulation permits, which have no significant relationship with rent. However, the relationship between rent and post-regulation permits disappears once other variables are included. Models 3 and 4 demonstrate that when holding ownership, household, demographic and geographic variables constant, there is no significant relationship between median rent and the share of either pre-regulation or post-regulation permits.

Ownership

The regulatory changes resulted in a shift in the share of homeowners in the block groups where ADUs are pulled at above average rates, as models 3 and 4 demonstrate. The percent of owners in the block group is negatively associated with pre-regulation permits, but positively

associated with post-regulation permits. Pre-regulation permits tend to be in block groups with fewer homeowners relative to the number of SFR permits than post-regulation permits. There are two potential reasons for this. Prior to the regulatory changes, neighborhoods with a higher percent of homeowners may have been more forceful in their opposition to ADUs, regardless of the neighborhood's income level. And property owners in areas with high rates of renters might see more reason to increase the number of available units in the neighborhood than property owners in areas where renting is less common.

Household and Demographics

The percent of the population over 65 has no relationship with either pre-regulation or post-regulation permits. ADUs are not more likely to be built in neighborhoods that have large populations over 65 than any other neighborhood. Homeowners might build ADUs in order to age-in-place or to house family members or friends as they age-in-place, but this is no less likely in neighborhoods with a large share of individuals over 65 than in neighborhoods with few individuals over 65. The increase in ADUs, if they do house elderly individuals, may result in a slight change in the future neighborhood-level data on population over 65, but these demographics are not visible in historic data.

ADUs from both time periods are far more likely to be built in neighborhoods that have a high rate of households with non-relatives (including boarders, roommates, unmarried partners, foster children, etc.). Homeowners in areas where sharing a household with non-relatives is more common are also more willing to build an ADU. The ADU might be for a current resident in the household, or these homeowners might be more willing to share their property with more individuals.

Race/ethnicity has an ambiguous relationship with ADU permits. Los Angeles has a sizable Hispanic population relative to other US cities, but a relatively small Black population. And neither pre- nor post-regulation block groups have a significant relationship with the size of the Black population. Interestingly, block groups with a large share of pre-regulation permits do have a large Hispanic population; but block groups with a large share of post-regulation permits have a low Hispanic population.

Geography

Both pre-regulation and post-regulation permits are more likely in block groups further from downtown and the coast and outside of Hillside Areas. The San Fernando Valley, the northern portion of Los Angeles, is far from both Downtown Los Angeles and the beach, and it has a large share of SFR parcels. Even after controlling for the number of SFR parcels, permits appear to be more prevalent in the Valley than elsewhere in Los Angeles.

Discussion: The Effects of Recent Legislative Changes on ADU Permits

This research examines where homeowners pull permits for ADUs in Los Angeles in light of recent state-wide regulatory changes easing restrictions on ADU permits. Housing scholarship suggests that high rents incentivize homeowners to construct ADUs as rental properties. However, local neighborhood and homeowner associations restrict construction in low-density, high income neighborhoods (Glaeser et al., 2005; Poorten & Miller, 2017), potentially reducing the number of ADUs permitted in those areas. The 2017 state-wide legislation to ease ADU permitting nullified most local restrictions on permitting, including any neighborhood and homeowner association constraints. Further, if using the ADU as a rental property is the primary driver of new ADU construction, homeowners should have pulled more

permits in neighborhoods with high rental prices following the regulations than prior to the regulations. However, non-monetary reasons, like the need for a semi-independent living space to accommodate family, friends, or caregivers, affect this relationship.

I find that in middle- and high-income neighborhoods, homeowners were less likely to build ADUs prior to the regulatory change than after the change. From 2017-2018, a larger share of homeowners in middle- and high-income neighborhoods were able to pull permits for an ADU on their property. The mean median household income in block groups where homeowners pull permits rose following the regulatory changes, as did the mean median rent (though only slightly). Another shift came in the demographic makeup of the neighborhoods with permits: fewer post-regulation permits were in majority Hispanic neighborhoods than pre-regulation permits. However, homeowners in very high-income block groups pulled fewer permits than homeowners in middle- to high-middle income block groups (despite having a larger share of SFR parcels). While high-income neighborhoods tend to be restrictive, they seem less motivated to build ADUs than homeowners in middle- to high-income block groups.

High neighborhood rental prices should incentivize homeowners to take advantage of the 2017 regulatory change by building an ADU to rent out. This suggests that holding all else constant, post-regulation permits should be strongly positively correlated with average rent. However, non-monetary factors also motivate homeowners to build ADUs, suggesting that high rents in a neighborhood might be a less important determinant of post-regulation permits than other household characteristics.

ADU permits broadly reflect the characteristics of single-family housing. Permits for ADUs in Los Angeles are more frequently pulled in neighborhoods with above average rates of homeownership and high rates of single-family parcels—largely because these are the types of

neighborhoods where ADUs are allowed. And single-family neighborhoods with high rates of homeownership tend to be higher income and less diverse than more densely built neighborhoods.

Controlling for the number of available single-family residential parcels in the neighborhood shifts the relationship between ADU permits and the socioeconomic variables. Unexpectedly, high rental prices in a neighborhood are not a determining factor of ADU permits after controlling for other variables. This suggests that homeowners are not primarily motivated to build ADUs as rental properties, or that homeowners are motivated by the opportunity to have a rental property, but neighborhood rental prices do not factor into that decision. As I discuss in the next chapter, not all homeowners wish to become resident landlords with strangers on their property.

Both pre- and post-regulation permits are much more likely in neighborhoods with a high percent of households with non-relatives. In neighborhoods where people already share housing with non-related individuals, like roommates and boarders, homeowners are more likely to get a permit to build an ADU. This suggests that homeowners must be comfortable sharing household space with non-relatives before they build an ADU for this purpose. It is possible that homeowners who already have roommates or boarders living in their house will build an ADU to house that person or more people, or homeowners are more accepting because they see other people in their neighborhood with boarders or roommates.

Chapter 3: Transforming Homeowners into Landlords

California legislators passed new laws, effective 2017, to relax regulations around accessory dwelling unit (ADU) construction and enable homeowners to more easily permit new units on their property. The goal, in part, was to increase the availability of affordable rental housing across the state, and particularly in cities suffering from a serious housing shortfall.

ADUs can increase in low-cost housing in two ways: directly and indirectly.

Homeowners can offer ADUs as low-cost rental units directly. Proponents of ADUs argue that ADUs are low-cost housing (Brinig & Garnett, 2013; Davis, 2018). Given that ADUs tend to be built in neighborhoods with high rates of single-family housing, ADUs are more affordable than the single-family homes in the neighborhood. However, research suggests that ADUs do not significantly differ in price from other rental units in a neighborhood after controlling for the homeowner's relationship to the tenant and the size of ADUs relative to other rental housing (Brinig & Garnett, 2013; Ramsey-Musolf, 2018; J. Wegmann & Chapple, 2012).

Indirectly, ADUs lower costs by increasing the number of housing units on the market. By increasing housing supply, housing prices should stabilize and become more affordable. However, the case of ADUs complicates this assumption because ADUs differ from other rental units in two important ways. First, not all homeowners wish to use their ADU as a rental unit, so construction does not imply entry into the housing market. In turning their ADU (or main house) into a rental property, homeowners transform into landlords with new obligations to their tenants. And while ADUs have their own entrance, kitchen, and bathroom, homeowners still sacrifice some measure of privacy on their private property. Further, non-monetary factors can motivate homeowners to build an ADU on their property, like a desire for a semi-independent, flexible living space.

Second, if monetary reasons motivate a homeowner to build an ADU, then short-term rental housing can offer a more flexible—and potentially a more lucrative—means of capitalizing on the property investment. Los Angeles recently implemented restrictions on using newly constructed ADUs as short-term rental properties; however, the effectiveness of these measures is yet to be determined.

This chapter investigates the promise of ADUs as low-cost housing through a survey of homeowners who pulled a permit to build an ADU in the City of Los Angeles between 2013 and 2019. Of the 6,500 homeowners with a permit, close to 5% completed the survey. Participants responded to a range of questions about ADU use, construction and financing, as well as several socioeconomic questions. I combine responses to questions about usage with responses to socioeconomic questions to understand what characteristics are associated with use as a long-term residential unit rather than a short-term rental or a non-residential property. Further, I examine the rents homeowners charge to understand how ADUs compare to other rental properties in the same neighborhood after accounting for size and relationship to the tenant.

Results of the survey suggest that the recent surge in ADU permits will marginally add to the supply of low-cost, long-term housing in Los Angeles. ADUs are a unique form of housing, as they are not always used as a separate housing unit. Not all homeowners express a willingness to share their private space with a stranger, and high-income homeowners are more likely to use the ADU as an office or guest room rather than as a residence of any kind. While homeowners are incentivized to build an ADU for a variety of reasons, they are primarily driven to share their private space by economic need or a familial relationship.

Resident Landlords and ADUs

The growing body of literature on ADUs focuses primarily on four aspects: the informal construction of ADUs (Gellen, 1985; Kinsella, 2017; Mukhija, 2014); local resistance to ADUs, particularly through legislation (Anacker & Niedt, 2019; Liebig et al., 2006; Pfeiffer, 2015); the importance of ADUs given a shift in household demographics and for an aging population (Antoninetti, 2008; Infranca, 2014, 2016; Liebig et al., 2006); and the importance of ADUs as a form of infill development to densify low-density, single-family neighborhoods (Infranca, 2014; Wegmann & Nemirow, 2011) while providing low-cost rental housing (Brown & Palmeri, 2014; Chapple et al., 2011; Ramsey-Musolf, 2018; Rudel, 1984).

Of interest here is the issue of ADUs as a source of low-cost housing. In addition to examining the ADU literature on the drivers of ADU construction and the rental costs relative to the general rental market, I examine theories on the hurdles people face in sharing private space. Despite policymakers' claims that easing regulations on ADUs will increase the availability of affordable housing, the literature is murky on how useful ADUs will be in filling in the affordable housing gap.

The Drivers of ADU Construction

Researchers generally attribute the construction of ADUs to either 1) the need for additional housing capacity in the face of demographic change (Gellen, 1985; Hare, 1989) or 2) a desire for additional income by single-family homeowners (Ruud & Nordvik, 1999; Rudel, 1984). The two drivers suggest homeowners have different uses for their ADUs:

1) Demographic change:

Single-family housing is modeled on the concept of the traditional family: a nuclear family with two parents and children (Gellen, 1985; Oliveri, 2016). However, the traditional

family is a dated concept. Since 1960, the average household size has declined from 3.3 people to 2.5 people, and more adults are living alone (US Census Bureau, 2016). Further, homeowners are an aging population, with more householders over 65 than under 30 and approximately 14 million adults over 65 living alone. The demographic change suggests a need for housing types like ADUs, as they are better suited to these smaller households (Infranca, 2014, 2016). ADUs are smaller than the typical single-family home, but they provide individuals with a semi-independent living space. This is ideally suited for homeowners who wish to live near family, friends, or caregivers but do not want to sacrifice privacy in their kitchen, bathroom, or living space. Homeowners driven by demographic change are more likely to use their ADU for non-monetary purposes.

2) Income:

Since the 1970s, economic growth in the United States has slowed and for households in lower- and middle-income brackets, income growth slowed significantly (Stone et al., 2020). Simultaneously, housing prices have risen, and in the Los Angeles-Long Beach-Anaheim metro region, over 40 percent of all households are cost-burdened, spending over 30% of their income on housing costs. For homeowners struggling financially, an ADU provides an opportunity to supplement their income with rental income. Income is a strong incentive. Ruud & Nordvik (1999) find that people are more likely to rent out space in their house for financial reasons than simply because they have extra space. Rudel (1984) finds that accessory apartments are more common in homes with a lower than average income and a smaller than average household. And according to housing theory high rental prices should incentivize homeowners to rent out that space.

For homeowners driven by economic need, ADUs function as either a long-term rental (of over a one-month stay) or a short-term rental (of less than a one-month stay). The Southern California Association of Governments estimates Los Angeles currently needs over 320,000 housing units, and it will need another 130,000 units in the next fifteen years. But for homeowners, using their space as a short-term rental presents an appealing and flexible alternative to long-term rentals. Short-term rentals, as propagated through platforms like Airbnb and VRBO, have surged in popularity in the past ten years. However, units used as short-term rentals do not meet the demand for long-term housing; these units function instead as hotel rooms (Lee, 2016). A recent survey in Portland found that 32 percent of ADUs were being used as a short-term (less than 1-month occupancy) rental (Gebhardt et al, 2018). Because short-term renting offers a flexibility of use and could potentially bring in more income, this could be an attractive option for homeowners in Los Angeles. However, the Los Angeles City Council passed the Home Sharing Ordinance (CF 14-1635-S2), effective as of 2019, to limit homeowners from using ADUs built after 2017 primarily as short-term rentals.

These drivers are not contradictory. For instance, advocates of ADUs for aging in place suggest that both changing demographics and a need for income drive elderly adults living on a fixed income to construct an ADU (Cobb & Dvorak, 2000); elderly homeowners can live in the new unit sized for an individual or couple rather than a family, and rent out their primary residence.

Not all uses stem specifically from demographic change or economic need. Some homeowners use their ADU as a flexible space, like a home office and guest bedroom. Pfeiffer (2015) finds that in high-income communities trying to preserve their single-family home identity, homeowners are less likely to use their ADU as long-term housing and more frequently

refer to the unit as a guesthouse. Wegmann and Chapple (2012) found in the survey of homeowners in the East Bay that a majority of the secondary units were used as long term housing. Though the demographic differences between homeowners with secondary units and those without were slight, their survey did suggest that households with secondary units are more likely to be smaller, have lower incomes, and have fewer white adults.

Sharing Private Space

The drivers of ADU construction suggest a willingness amongst homeowners to share their private home or backyard with family members, friends, or strangers. However, this assumption should be questioned—particularly as it regards strangers. Though these units have a separate entrance, kitchen, bathroom, and living space, they still share some space with the primary unit, including the yard or garden. Research suggests that privacy concerns inhibit construction of ADUs (Liebig et al., 2006).

The rise of homeownership is tied to a rise of privatism, or a withdrawal from public sphere of work into the private sphere of the family (Ronald, 2008). The division between the public sphere and the private sphere⁵ was an essential part of establishing a cultural identity for the middle-class in the nineteenth century (Davidoff & Hall, 1987; Ronald, 2008). By the 1950s, suburban and urban single-family detached homes were accessible to a larger share of the population. Designed for an idealized model of the nuclear family, single family homes provided more homeowners access to a new level of privacy, including private parks (a.k.a. backyards) and swimming pools for themselves and their children. Homeownership is more than an

⁵ Scholarship on the public and private spheres is indelibly linked to discussions of gender relations and gender equity, as the private sphere symbolized the domestic sphere to which women and women's work were relegated; the public sphere symbolized men's work and space. Feminist scholars have rightfully critiqued this distinction over the past fifty years (see Kerber, 1988).

investment or status symbol; a person's political and social identity are rooted in a person's position as a homeowner (McCormack, 2014). Sacrificing the privacy, control, and security that homeownership affords potentially challenge that identity.

The theories of separate spheres and hostile worlds focus on the how the division between public and private activities translate into economic relationships. These theories suggest that mixing economic and intimate spheres is taboo (Bandelj et al., 2015), and that people will purposely avoid any economic activity that combines the two unless absolutely necessary. Thus, renting out an ADU located in an intimate space—like in the backyard of or attached to a home—would be taboo. But recent scholarship shows that the relationship between economics and intimacy is complex, and people combine economic and private relationships frequently (Zelizer, 2007). An alternative theory suggests that intimate relationships are fully explainable through economic, and that mixing intimate relationship and economics is nothing but another form of market activity (Bandelj et al., 2015; Zelizer, 2007). In the 'nothing but' perspective, homeownership is nothing but a market relationship, so homeowners should feel no reluctance to use their home as a rental. Zelizer (2007) argues that both theories are overly simplistic. She proposes the "connected lives" framework, which assumes that intimate relationships mix with economic relationships in myriad and complex ways, and research conducted through this framework examines when and where intimacy and economics co-exist. More research is needed to understand the complexities of economic and intimate relationships.

ADUs as Low-Cost Housing

Data on the affordability of ADUs on the rental market is still limited, despite frequent assertions in both the literature on ADUs and current legislation that ADUs are a form of low-cost housing (Rudel, 1984; Chapple et al, 2011). The claim that ADUs are a form of low-cost

housing is pervasive. Senate Bill 1069 explicitly lists ADUs as a form of low-cost housing, declaring that “accessory dwelling units offer lower cost housing to meet the needs of existing and future residents within existing neighborhoods, while respecting architectural character” (S.B. 1069). The literature suggests ADUs are a low-cost alternative to the average rental unit for four reasons:

1) Tenant-landlord relationship

ADUs housing family and friends of the landlord are rented at prices lower than similar rental units in the area. Surveys from Beverly Hills (City of Beverly Hills, 2014) and Portland (Gebhardt et al., 2018) suggest friends and family frequently live in ADUs at a low or no cost. In Portland, over a third of homeowners said they used the ADU to house family or friends in the past. In Beverly Hills, nearly half of the occupied units housed someone related to the primary homeowner. Ruud and Nordvik (1999) found that landlords are more likely to charge family and friends 14 percent less on average than non-related tenants.

2) Resident landlords

Resident landlords, or landlords who live at the same property as their tenants, are less likely to be driven purely by financial motivations (Harris & Kinsella, 2017; Patterson & Harris, 2017) (Harris and Kinsella). Resident landlords are more likely to allow tenants to provide non-monetary services, like baby-sitting or household maintenance, and reduce the rental price than absentee landlords (Brinig & Garnett, 2013; Harris & Kinsella, 2017; Patterson & Harris, 2017; Wegmann & Chapple, 2012). However, the relationship between resident landlords and low rents is complicated by the fact that resident landlords are also more likely to house family and friends (at a reduced price) than absentee landlords.

3) Average ADU Size

ADUs are smaller on average than other rental units. Not only does the small size reduce the cost of construction (Talen, 2013), it leads to lower rental rates than large rental units. Wegmann and Chapple's (2012) study found secondary units in the East Bay to be cheaper than the average rental unit in the area, except when factoring in the price per square foot. Because the units are on average 20 percent smaller than other types of housing, they offer a more affordable housing package than other rental housing.

4) Permit status:

Many studies focus predominantly on unpermitted accessory units rather than permitted units. As noted by Brown & Palmeri (2014) and Ramsey-Musolf (2018), whether or not a unit has a permit could make a difference in how much rent is charged. A survey of homeowners with permitted ADUs in Portland suggests these units have higher rents than comparable multi-family units (Brown & Palmeri, 2014), unlike the survey of mostly unpermitted secondary units in the East Bay, where rents are generally lower. Baer (1986) suggests that the "shadow market" or informal housing market produced more low-cost housing units for renters and owner-occupants in the 1980s than the formal market had. Goodbrand & Hiller's (2018) interviews of renters living in secondary suites in Calgary suggest that the unpermitted nature of these units frequently afford them a flexibility in rent or utilities that they would be less likely to have in other rental housing. The role a permit plays in a unit's rental price remains unclear, however.

The question of affordability remains unclear. Because ADUs are frequently rented at low rates to family and friends and are smaller on average than other rental units, they tend to have lower rents than other units in the neighborhood. And in neighborhoods dominated by single-family homes, duplexes, and small multi-family apartment buildings, ADUs offer an affordable alternative. However, they are not "Affordable Housing"—and not even always low-

cost housing. Rudel (1984) finds accessory units in Babylon, NY were typically more expensive than publicly subsidized housing, and inhabitants generally earned more than those in public housing. Ramsey-Musolf (2018) notes that while potential ADUs often get counted as low-income housing in California, in reality, they rarely function that way.

Data and Methodology

This study examines how homeowners use ADUs. Specifically, I examine how homeowners with permitted ADUs in the City use or intend to use the additional space, and I compare rental prices to those of nearby rental units. Though there are as many as 50,000 unpermitted units in Los Angeles, as well as a number of units permitted prior to 2013, my study focuses on those homeowners who received permits to construct ADUs between 2013 and 2018. This time period neatly bookends the legislative changes. To gather information about ADU usage, I surveyed over 6,783 homeowners who received a permit to build an ADU during this time period, obtaining 321 valid responses. I compare information from the survey to geographical and statistical information for Los Angeles grouped by the city's Community Plan Area.

Survey Participant Identification

In addition to the recent changes to state-wide legislation, there has been an increased interest in ADUs in Los Angeles, particularly in the past decade. Beginning in 2013, the City of Los Angeles began collecting data on ADU permits. The Los Angeles Department of Building and Safety (LADBS) publishes all building permits through the City's Open Data Portal. These data include basic information about the property and permit, like the permit type, status, and address, and the Assessor Identification Number (AIN) associated with the parcel.

The initial dataset for the 2013 to 2018 time period included over 10,000 entries of potential ADUs. After deduplicating this dataset and removing all entries where permits had not been issued for various reasons or had been revoked, there were just under 7,000 entries. Because ADUs are frequently permitted under a new address instead of the address of the primary residence on the property, I used the AIN to identify the address for the primary residence according to the Assessor and removed the few that did not match or geocode.

Survey Participant Recruitment

I employed a mixed mode approach to survey homeowners with permits for ADUs. This included two pilot surveys using two forms of data collection and a larger study including all housing units. In total, I collected 321 valid survey responses.

Pilot 1: Following the methodology employed by Gebhardt et al. (2018) in a recent survey of homeowners with ADU permits in Portland and Wegmann & Chapple (2012) in a survey of homeowners in the East Bay, I mailed a postcard to the primary address associated with each permit taken out for an ADU. The postcard had a shortened URL and a QR code to direct the homeowner to an online survey, hosted by Qualtrics. To test the strength of the postcard notification method, I piloted this method with a random sample of 500 participants across Los Angeles. I conducted this pilot in March of 2019, and I received 10 attempted responses to the pilot in the following three months, or a 2% response rate.

This is a low response rate, but the quality of the responses was high. Though most of the questions were optional (with a few key exceptions), the participants completed them. There were a few exceptions, like when the participant said that they neither lived in nor had an ADU on the property; this triggered the end of the survey without capturing additional information about why an ADU was permitted for that address.

Pilot 2: Unsatisfied with the low response rate, I began a second approach to data collection. With a small team of undergraduate students from UCLA, I conducted a door-to-door survey between May and July of 2019. After geocoding the ADU data by neighborhood using the Los Angeles Times neighborhood boundaries, I randomly selected ten neighborhoods in Los Angeles for this part of the survey. After identifying the number of permits per neighborhood, I used Excel to randomly assign a number to each neighborhood and pulled the first ten. The neighborhoods were spread across the city, had a range of median income levels, and differing numbers of ADU permits. Together, the ten neighborhoods included 617 houses where the homeowner was issued a permit to build an ADU.

Over six weeks, the survey team knocked on 420 of these houses. We went out two to three weekday evenings per week and Saturday at mid-day. Residents who were home and willing were taken through a variation of the original survey with questions slightly reformulated to suit in-person interviews. We collected phone numbers for those who preferred a telephone interview, and we left flyers at houses where no one answered the door or where a resident was unable to take the survey at that moment or by phone. The team left flyers at 286 houses and conducted interviews with 50 individuals, by phone or in person. Another 18 houses were under construction, 17 were either for sale or lease or otherwise vacant, and 12 were inaccessible to the survey team. A further 29 individuals chose not to participate in the survey and eight units did not fit the profile of a main house with an ADU. This method elicited a much higher response rate than the first pilot had, with 12% of potential participants responding.

While the response rate was much higher than through the postcard method, there was a serious limitation: the quality of the response was not as good. Often, the person who answered the door was not the most knowledgeable about the ADU, the permitting and construction

process, or the goals for the unit. There were several occasions where the adult children in the household, aged 18 to 25, responded to the survey, but were unable to provide answers to several important questions.

Population Survey: To encourage a higher response rate, I sent a postcard with instructions to take the survey to 6,488 addresses where permits were taken out with the added incentive of a \$5 gift card for a complete response to the survey online. Incentives can bias responses if it leads socioeconomically disadvantaged individuals to participate (Teisl, Roe, & Vayda, 2006). I am less concerned about this problem given the universe is homeowners building ADUs. Nonetheless, I take socioeconomic conditions into account in the analysis to contend with this potential problem. The first round of the postcards elicited 181 responses within the first month, or a 3% response rate. The low response rate is a limitation of this method; but overall, the responses were of fairly high quality, and there were 166 fully completed and 15 partially completed surveys. The second round of postcards elicited 91 responses within a month, 86 of which were fully completed. A total of 264 responses were fully completed and 3 were mostly completed.

Rental Statistics

Data on current rental prices is variable. I consider three estimates of average listed rental data by neighborhood. Zillow Research provides a neighborhood level estimate of rents based on both current rents pulled from their website and culled from other sources, and then weighted by the housing type in the area. Because this data includes single-family homes in the universe, rents from this estimate are significantly higher than other rental estimates. Though Zillow Research breaks this data down further by number of bedrooms, it does this for just a small portion of the neighborhoods in Los Angeles. Rentcafe publishes rental data by neighborhood in

Los Angeles from the asset management company Yardi Matrix; but Yardi Matrix bases their averages on listed rental prices for units in multifamily buildings. This data is correlated with Zillow data, but one significant difference is that average rent from Zillow Research is on average 24% higher than average rent from Rentcafe by neighborhood. Zumper is the third rental listing site that publishes data at the neighborhood level in Los Angeles. Zumper publishes monthly reports and limits data to units that are available through the website or third-party sites that month.

Neighborhood Data

I pull 2018 census block group, tract, and city-wide data from the American Community Survey; I use both the ACS 5-Year Estimates (2014-2018) and the ACS 1-Year Estimates (2018) for comparison with neighborhood and city-wide characteristics.

Results

The goal of this chapter is to determine the extent to which ADUs in Los Angeles will function as low-cost, long-term housing. I address this question by examining the responses to questions about how survey participants use their ADU and how much those using it as a long-term residence charge. Of the 321 responses to the over 6,500 addresses with permitted ADUs, the majority (306 responses) were homeowners living in the main house on the property. An additional 13 responses came from homeowners living in the ADU on the property and 11 responses came from renters of either the ADU or main house. In this paper, I focus on homeowners, the largest response group and the primary target of the survey.

Survey participants skew higher income than the city population. Participants' average annual household income of \$146,760 is significantly higher than the median income in the

region. As seen in Table 10, the median household income for the City of Los Angeles is \$62,474, though for owner-occupied households, the median income is higher at \$101,149 (ACS 1-Year Estimates, 2018). For block groups with ADUs in Los Angeles (weighted by the number of ADUs), the mean median household income is \$64,653.

Participants also come from slightly higher income neighborhoods than non-participant homeowners with permits. The median household income of block groups with survey takers is \$77,615, and the median household income for survey takers is significantly higher and twice the area median income. However, constructing an ADU is expensive: on average, participants spent over \$100,000 on their ADU, and that figure includes homeowners who reduced costs by using free labor (their own or someone else’s). In order to be able to afford an ADU, a homeowner must have some financial security, suggesting that even in low income neighborhoods, homeowners with ADUs might be higher income than the median.

Table 10. Statistics for LA City, ADU Permit, and Survey Takers

	Los Angeles 2,506 block groups	ADUs 1,717 block groups	Survey Takers 267 block groups
Median Household Income (\$), 2018 (ACS)	62,474	64,653	77,615
Median Rent (\$), 2018 (ACS)	1,474	1,395	1,600
Pct. White, Non-Hispanic (%), 2018 (ACS)	27.3	24.4	38.3
Pct. Single-Family Housing (%), 2018 (ACS)	37.8	52.7	54.0

Participants are much whiter than the population of Los Angeles (27.3%) or even block groups with survey takers (38.3%). Of the homeowners who chose to identify their ethnicity, 64% identify as white or Caucasian, 19% identify as Hispanic, Latino, or of Spanish origin, 14% identify as Asian or Asian American, and 2% identify as Black or African American. Most homeowner participants live with their spouse or domestic partner (68%), but a substantial group are single (21%). Eleven percent are widowed, divorced, or separated. And more participants

identify as female (54%) than as male (45%). As just a small sample of a much larger population, it is unclear how closely participants' attributes resemble attributes for the larger population of homeowners with permits.

ADU Uses

ADUs present homeowners with several different usage options: they commonly function as a long-term rental unit, a long-term residence for family, friends, or caretakers, a short-term rental unit, a guest room, a business space, and a recreation room. Understanding how the survey participants in Los Angeles use their ADU offers insight into the effect of the recent surge in ADU permitting on housing availability in Los Angeles.

Survey participants responded to questions about how they use the ADU currently, in the past, and what their future plans are for the property. Most homeowners (76%) report they are currently using the ADU as a residence of some kind (see Figure 9). In addition to the 16 homeowners residing in the ADU, another 68 have either a family member (67 participants) or caregiver (1 participant) living in the ADU. There are 122 participants using their ADU as a rental property, of whom 90 currently have a long-term tenant and 13 have a short-term tenant (18 were did not have a tenant at the time of the survey). A much smaller group is using the property as a guest room (38 participants), a business space (17 participants), or in some other way (7 participants). A further 31 participants were still in the process of building their ADU when they completed the survey.

Several participants wrote in their response rather than selecting an option. Three people wrote that they primarily use the ADU as a guest room, but also sometimes have short-term renters stay. These were coded as "Guest Room", but it suggests that homeowners enjoy the

flexibility ADUs offer, switching between several uses. Three participants wrote that they are as yet undecided about what to do with the property.

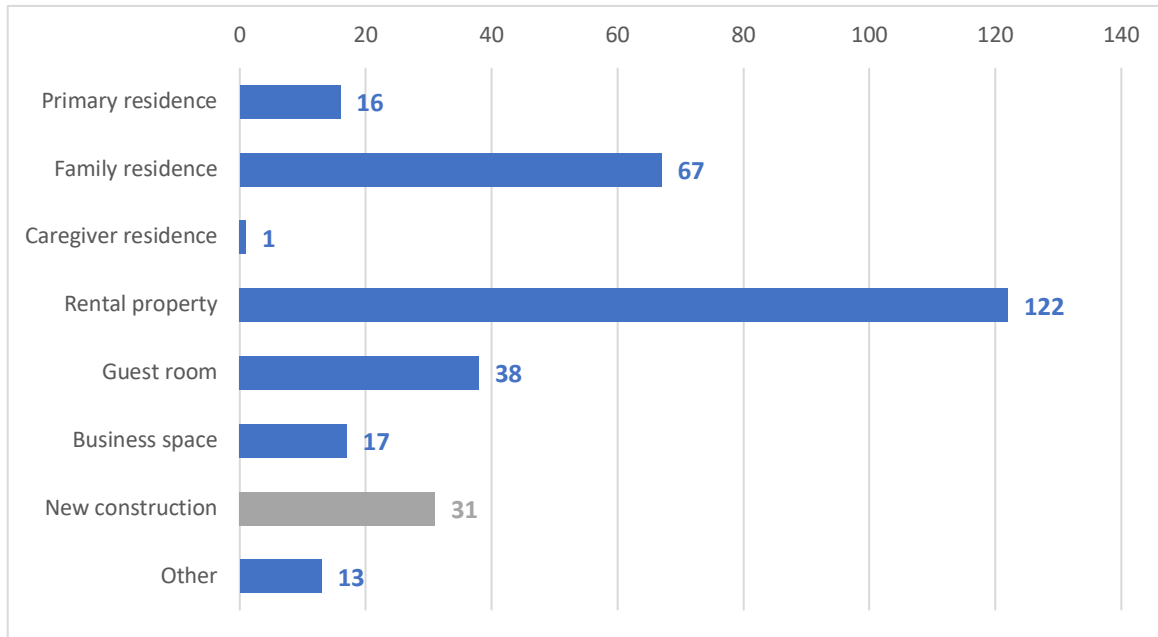


Figure 9. How Homeowners Currently Use their ADU

Question: "How are you using your ADU (second unit, garage unit, granny flat) most right now?" N=305

I compare how people use the ADU and various self-reported and block group level socioeconomic factors. Those in the highest income bracket are the group most likely to use their ADU for a non-residential purpose: one-third of these participants use their ADU as a guest room or business space (and 80% of homeowners who use their unit for a non-residential purpose have a household income of over \$150,000) ($\chi^2(8, N=229) = 24.23, p < .005$, Fisher's exact = $p < .005$). Only one very low-income household (with a household income between \$30,000 and \$45,000) uses their ADU for non-residential purposes (as a guest room). On average, homeowners who use their ADUs for non-residential purposes live in block groups with a higher median household income (\$87,192) than homeowners who use their ADUs for a residential purpose (\$73,583). Non-residential ADUs are also in block groups with a higher average monthly rent (\$1,848) than residential ADUs (\$1,651).

Future Uses: Long-Term Residence

In response to question about future uses of the ADU, homeowners selected from a set of seven multiple choice options and they could write in another use under 'other'. Because there were no time limits set on the 'future' in question, 76 participants selected multiple options and a few selected most or all of the available options. As one participant wrote in (after selecting all responses), "Owning property allows me to use my house how ever [sic] I want - that's why I own and don't rent."

Many homeowners plan to use the space as a long-term residence of some kind. A majority of participants, 246 of 301, said that they would use the ADU as their primary residence, a residence for a family member or friend, a residence for a caregiver, and/or a residence for a long-term renter (and 179 do not plan to use it any other way). Figure 10 shows that the most popular response overall was 'long-term rental,' which 56% of the participants selected. Over a third of the participants plan to use the space as a residence for friends or family, and 11% of participants will use it as their primary residence (which was the most popular response for participants already living in the ADU). Relatively few people (6%) plan to use the space for a caregiver.

Several participants wrote in that they are motivated by the housing crisis to use the ADU as a long-term residence. One participant wrote, "There is a housing shortage and we built this unit to contribute to the housing stock not as a short term rental." Another participant wrote that they feel guilty about using it as a short-term rental rather than as a long-term housing.

Other participants stressed the role of the Home-Sharing Ordinance (limiting use of recently constructed ADUs as short-term rentals) in determining their decision to use the ADU for long-term rentals rather than short-term rentals.

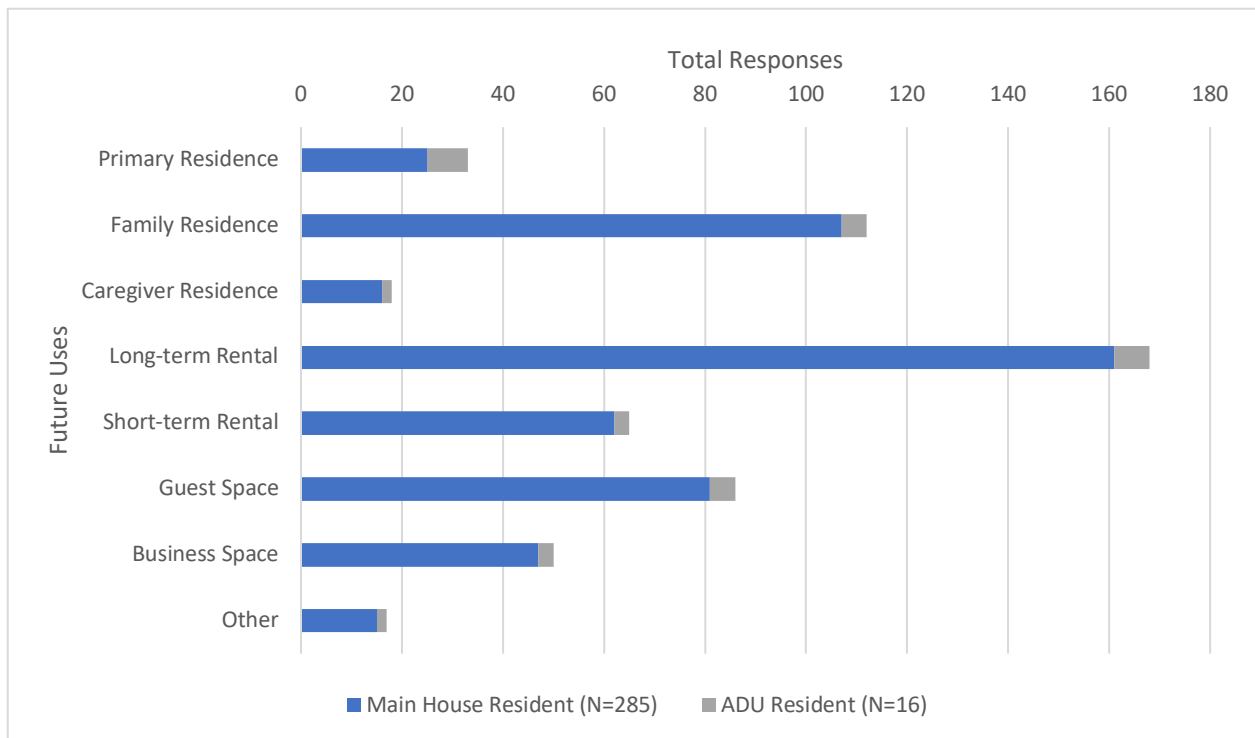


Figure 10. How Homeowners Expect to Use their ADU in the Future
 Question: “How are you planning to use your ADU in the future?” N=301

Future Uses: Short-Term Rental

Using the ADU as a short-term rental is not nearly as popular as using it as a long-term rental; only a fifth of the participants plan to use it that way (whereas over half plan to use it as a long-term rental). And as was made clear from the question about current uses, most homeowners who plan to use the space as a short-term rental also plan to use the space in other ways. A benefit of short-term renting is the flexibility that it offers homeowners who might want to use the space for multiple reasons, like as a guestroom, home office, and rental space. Of the 65 participants who plan to use the ADU for short-term rentals, and only seven never plan to use the space as anything other than a short-term rental. Twenty-five participants also plan to use the ADU as a long-term rental.

Flexibility was the primary motivating factor participants cited for using their ADU as a short-term rental, but other factors also entice homeowners to use the ADU this way. For

instance, some participants prefer using the ADU as a short-term rental because they fear committing to a long-term tenant. Three participants alluded to the idea that long-term tenants have rights that make eviction difficult, and two participants suggested tenants might squat in the unit permanently.

A third factor driving homeowners to use ADUs as a short-term rather than long-term rental was that the short-term rental brings in more income. On average, participants charge \$120 per night for their ADU. If they have short-term renters for just half a year, the unit could bring in over \$20,000 (before fees and taxes)—and still provide the renter with the flexibility of using the unit in other ways during the rest of the year. A full year's rent at the median monthly rental price for non-relatives (\$22,272) earns the homeowner only \$2,000 more than a half year of short-term renting. One caveat to this calculation is that a short-term renting requires more time and money to maintain than long-term rental units. Units are cleaned regularly between guests and any amenities the host provides must be stocked frequently. The biggest drawback participants with short-term rentals cited is the frequent cleaning required.

Future Uses: Rental vs. Non-Rental

The number of participants willing to rent out the unit (sharing with a stranger) is only slightly higher than the number of participants who are not interested in sharing space with a stranger. Slightly over a third of the participants (112 of 301) plan to use the ADU as either a long-term or short-term rental. A third of participants (101 of 301) have no plans to rent out the unit at all. Instead, they will use the ADU as either a long-term residence for themselves, family, friends, or caregivers, or as a non-residential space (such as a business or guesthouse). Of those participants who will not rent out the unit, half (53 of 101) plan to use the ADU only as a non-rental long-term residence.

Other than the rental income that the homeowner charged the tenant (as I discuss in more detail below), no significant differences appear to exist between the two groups, either in terms of related socioeconomic characteristics or in terms of their experience renting out the unit. While one homeowner wrote in that a lack of privacy is a concern, privacy was actually a more serious concern for the small group of renters who participated in the survey. Of the 15 renter-participants, three mentioned a lack of privacy as a major drawback of their living situation.

Future Uses: Non-Residential Use

A small group of participants constructed the ADU for reasons other than earning additional income or to house a family member or friend. Around 16% of the participants have no plans to use the ADU as long-term housing, but are keeping it as an occasional guest space, business space, or family space. In fact, using the space as a guest room was the third most popular response to the question about future use, as 28% of participants included this option. Most participants explain they do not use the space as a residence because they use it either as a business space or as a guest room. However, a third of the participants who have no plans to use the space as long-term housing noted that they do not want to share their space with strangers. This potentially represents a smaller proportion of participants than truly feel this way, as social desirability bias may prevent participants from noting an unwillingness to share their space with strangers. Again, the vast majority of participants planning to use the ADU solely for non-residential purposes were very well off, with two-thirds earning over \$150,000. Only 40% of those planning to use their ADU solely as a long-term residence had an annual household income over \$150,000. One participant wrote in simply that they “don’t need [the] income.”

This group of participants has no plans to generate income through long-term or short-term renting; however, two participants mentioned the possibility of improving their home equity

by increasing the house's value. An ADU is a long-term investment in their property with more immediate benefits of providing the homeowner with a flexible use space on their property.

ADU Rental Income

To determine whether ADUs are a source of low-cost housing in Los Angeles, the survey covers several topics related to rental price, the landlord-tenant relationship, and the size of the ADU. Homeowners who have or plan to have a long-term tenant (including a long-term renter, a family member or friend, or a caregiver) living in the ADU answered a short set of questions about rental income for the property. Eighteen homeowners had vacant ADUs at the time of taking the survey and were therefore not receiving rent from those units.

Of those with a tenant, 93 were receiving rent and 74 were not. Figure 11 shows a breakdown of rents received by participants by homeowner-tenant relationship. The majority of participants receive between \$1,000 and \$1,999 on average per month. For those participants receiving rent, the median rent is \$1,767 per month. While the median gross rent for all units in the City of Los Angeles, at \$1,474 per month (ACS 1-Year Survey, 2018), is lower than the survey figure, estimates of average listed rental prices suggests the median for ADUs is commensurate with or even lower than the average newly listed rental properties in the region. These figures range from around \$1,900 per month according to Zumper to around \$2,800 per month according to Zillow. However, I consider three additional factors that affect the rental

price the landlord asks: the landlord-tenant relationship, the size of the property, and the location of the property.

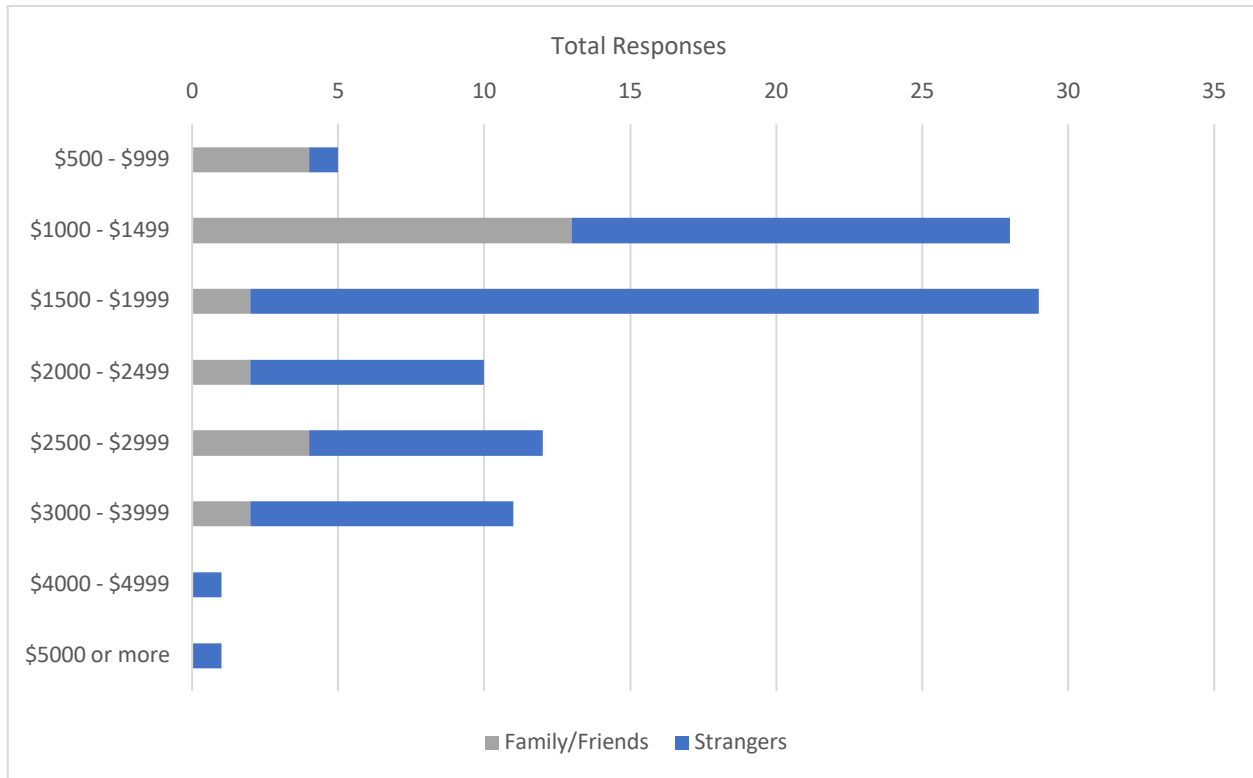


Figure 11. Rental income received by homeowners
 Question: "On average, how much rent do you charge per month?" N=97

Relationship to Tenant

Research suggests that the tenant-landlord relationship factors into how much landlords charge their tenants (City of Beverly Hills, 2014; Gebhardt et al., 2018; Ruud & Nordvik, 1999). In the survey, homeowners categorize the relationship to their tenant prior to the tenant moving in as either family, friend, acquaintance, or stranger. Table 11 breaks down the landlord-tenant relationship by rental income. Only homeowners with family members in their ADU (or vacant units) are not collecting rent from their tenant. Eight homeowners with family members in the ADU collect rent from their tenant, but the vast majority do not. Relatively few homeowners list the tenant as a friend or acquaintance (18 participants), but those who do also receive rent from

the tenant. Most homeowners (62 participants) have a previously unknown tenant in their ADU, and all of those individuals pay rent.

Table 11. Landlord-Tenant Relationship and Rent

	Family	Friend/ Acquaintance	No Relation	Vacant
Rental Income	8	18	62	0
No Rental Income	29	0	0	19

Question 1: “Are you currently receiving rent from your ADU?”

Question 2: “Which of the following options best describes your relationship to the current occupant when they first moved into the ADU?” N=136

Homeowners with long-term renters evaluated the rental price of the unit relative to the market value for the rental property. Participants described the rent as “above market value”, “at market value”, or “below market value”. Of the 81 participants, 53 charge market value rent for their property. Another 24 said that they charge below market value rent, and 10 charge above market value rent. Table 12 shows how homeowners responded to the question segmented by the landlord-tenant relationship. Homeowners who do not charge rent did not respond to this question, reducing the number of family members in the sample. Homeowners with family members and friends/acquaintances in their ADU are far more likely to set the rent for the property at what they consider below market value. But homeowners who rent to non-related tenants are more likely to rent the ADU at market rate ($\chi^2(4, N=87) = 10.54, p < .005$, Fisher’s exact = $p < .005$).

Table 12. Self-Assessed Market Value of Unit and Rent by Landlord-Tenant Relationship

Self-Assessed Rental Value	Family	Friend/ Acquaintance	No Relation
Above market value	1	1	8
At market value	1	8	44
Below market value	6	9	9

Question 1: “How much rent do you currently receive from your ADU?”

Question 2: “Which of the following options best describes your relationship to the current occupant when they first moved into the ADU? N: 87

In addition to assessing the market value of the rent, participants recorded the rent that they charge for the unit. The majority of family and friends who do pay rent for the unit pay less than \$1,500 per month in rent, and the median for the two groups is \$1,365 per month. This is \$100 less than the median rent in Los Angeles. The majority of non-related tenants pay over \$1,500 per month in rent and the median rent is \$1,856 per month. A close landlord-tenant relationship clearly affects the rental price of the unit. Homeowners with a non-related tenant are far more likely to charge a rental price similar to the city’s average listed price than homeowners with family or friends living in their ADU.

Size of the ADU

A second factor to consider when comparing ADU rental prices to those of other rental units is the size of the unit. ADUs are small on average, as the maximum size for a by-right permit is 1,200 square feet. Most of the ADUs in the survey are studio or one-bedroom units; combined, these two sizes account for 82% of ADUs in the survey. In comparison, studio and one-bedroom units account for just 51% of rental units in the City of Los Angeles (ACS 1-Year Survey, 2018). A much smaller share of ADUs have two bedrooms, and a very small group have three or more bedrooms. Since most ADUs are small, the relatively high rent for an ADU is important.

Table 13 breaks down the number of units and average rental prices by the number of bedrooms in the ADU and the tenant-landlord relationship. It also shows average rental prices in the City of Los Angeles (ACS 1-Year Survey, 2018). Average rental prices rise with the number

of bedrooms in the unit, ranging from the smallest ADUs (studio units) at \$1,588 per month to the largest ADUs (3 or more bedrooms) at \$3,125 per month. Focusing specifically on ADUs housing tenants with no relation to the landlord, the average prices rise further. Tenants in this group pay on average between \$1,667 for a studio to \$3,917 for an ADU with 3 or more bedrooms. In comparison, average rental prices in Los Angeles as a whole range from \$1,130 for a studio unit to 1,560 for unit with 3 or more bedrooms. Rental rates for ADUs are higher on average than rental housing across the city.

Table 13. Units and Rental Price by ADU Size and Tenant-Landlord Relationship

		Studio	1-Bedroom	2-Bedroom	3 or More
All tenants	Pct. of ADUs (%)	45	36	14	4
	Avg. Rent (\$)	1,588	1,921	2,696	3,125
Non-related tenants	Pct. of ADUs (%)	38	40	17	5
	Avg. Rent (\$)	1,667	2,020	2,975	3,917
Los Angeles, 2018 (ACS)	Pct. of Units (%)	16	35	35	15
	Avg. Rent (\$)	1,130	1,291	1,492	1,560

One important caveat to this comparison is that gross rent includes a wide range of units that are different from the recently built, recently inhabited ADUs. Tenants with a long residence in a unit generally have lower rental rates than new tenants moving in, and newly constructed units have a significantly higher gross median rent than older units. In 2018, the gross median rent for a unit constructed since 2014 was \$2,548 (ACS 1-Year Survey, 2018). Average listed rents (or the rents that new residents are asked to pay) are also much higher than mean gross rents.

Neighborhood

Finally, rental prices vary by neighborhood, and the average rent in a neighborhood factors into what landlords charge their tenants. I break the survey rental prices for non-related

tenants down by Los Angeles Community Plan Area (CPA)⁶ and compare this data to mean gross rent and mean listed rent for a one-bedroom unit (the most common ADU size for non-related tenants) in the same area. Table 14 shows mean rents from the survey are between \$300 and \$1,200 higher than mean gross rents for a one-bedroom unit in the same CPA. But the gap between mean rents from the survey and mean listed rents is wider, ranging from a difference of -\$300 to \$1,200. On the whole, rents for ADUs are higher than the nearby rental prices for a one-bedroom unit.

Table 14. Average Rent by Los Angeles Community Plan Area

Community Plan Area	Non-related Tenants (N)	Non-related Tenants' Rent (\$)	ACS 1-BR Rent, 2018 (\$)	Zillow 1-BR Rent, 2019 (\$)
Arleta – Pacoima	2	1,500	1,135	<i>Unavailable</i>
<i>Canoga Park – Winnetka – Woodland Hills – West Hills</i>	6	1,667	950	1,580
Granada Hills – Knollwood	3	1,583	1,250	<i>Unavailable</i>
North Hollywood – <i>Valley Village</i>	4	1,750	1,014	1,795
Northeast Los Angeles (<i>Highland Park</i>)	6	2,583	1,077	1,795
<i>Palms – Mar Vista – Del Rey</i>	11	2,205	1,300	2,330
<i>Reseda – West Van Nuys</i>	2	1,500	891	1,625
<i>Sherman Oaks – Studio City – Toluca Lake – Cahuenga Pass</i>	4	2,438	1,542	1,860
<i>Van Nuys – North Sherman Oaks</i>	4	2,000	1,181	1,596
West Adams – Baldwin Hills – Leimert (<i>Crenshaw</i>)	5	1,750	1,061	1,595
West Los Angeles (<i>Sawtelle</i>)	2	3,500	1,250	2,295
Westchester – <i>Playa del Rey</i>	4	2,125	1,578	2,540

Zillow rental data for italicized neighborhood.

Sources: ACS 5-Year Survey 2014-2018; Zillow, July 2019

⁶ Community Plan Areas are an official municipal designation for an area that combines several neighborhoods into a single region for the purpose of creating and implementing targeted policy and land-use goals. Of the 35 Community Plan Areas, only 24 had survey participants with long-term renters and only 12 had at least two participants with non-related tenants.

Discussion: ADUs as Rental Housing

This chapter examines the potential contribution ADUs make toward the supply of affordable housing in Los Angeles. Given that ADUs are unlike traditional rental units with absentee landlords, I focus on the three aspects of ADUs that might limit their effect on the rental market.

Do homeowners use their ADU as a rental property? A home is more than just a commodity or investment asset. It functions as status symbol and forms part of a homeowner's identity. It can be a safe haven: a private space where a homeowner can retreat from the public sphere. In transforming part of that space into a rental property, a homeowner will lose some of the privacy and security that a single-family home affords.

While a majority of participants (67%) currently use their ADU as housing of some kind, a fifth of participants do not. And 16% of participants have no plans to use the ADU as a long-term residence. Instead, these homeowners use their ADU as a home office, a guest room, or as an extension of their primary residence. For those in the top household income bracket, non-residential use is extremely popular. A third of those with incomes of over \$150,000 use the ADU as a non-residential extension of their house.

Many participants use their ADU as a residential unit, but not all are willing to house strangers in that space. Just over a third of the participants plan to use the ADU as a rental unit only—though another third of participants include using it as a rental as one of many options they will consider. Another third of the participants plan to use the ADU to house family members, friends, or caregivers, and have no plans to rent the property out. Altogether, 36% of participants have no plans to use the ADU as a rental unit for strangers. For participants who do not use their ADU as a residence, the most common reason for not renting it out (after using it as

a business or guesthouse) was that they do not want to share the space with strangers. This suggests that if the family member, friend, or caregiver moves out of the unit, it will not automatically join the rental market.

Do homeowners prefer to use their ADU as short-term rather than long-term housing?

For homeowners interested in capitalizing on their investment in a new ADU, short-term renting can be both more flexible and profitable than long-term renting. The vast majority of homeowners who use the ADU as a rental property are using it as a long-term rather than as a short-term rental. However, over a fifth of participants plan to use the ADU as a short-term rental at some point in the future. The recent Home-Share Ordinance restricting use of ADUs as short-term housing has diminished some of the enthusiasm for short-term rentals, but homeowners still like the flexibility short-term renting allows.

Do ADUs add directly to the supply of low-cost housing? Past research suggests that ADUs are a low-cost rental package compared to other nearby rental housing. However, ADUs contribute to long-term housing for two groups that require separate consideration: strangers versus family and friends. On average, family members and friends pay less than non-related tenants, and the median rental price for family members and friends is less than the median rental price in Los Angeles. In fact, most family members do not pay rent at all. This survey did not ask about non-monetary payments for the ADU. But tenants with resident landlords frequently provide services for the homeowner (like babysitting, yardwork, housework, or healthcare) in lieu of full payment for the unit. Family members and friends are more likely to provide these services than non-related tenants.

The median rent for ADUs with non-related tenants is higher than the median rental price for the whole of Los Angeles, but it is comparable to or even lower than the average listed price

found through rental listing websites like Zillow and Zumper—and it is lower than the median rental price for recently constructed units.

ADUs are smaller on average than rental units in the city. Due to their small size, ADUs are best suited for a single individual or a couple rather than a larger family or multiple roommates. A small unit also has fewer people splitting the rent. While ADUs might present a more affordable housing package than rental units as a whole, they are less affordable after taking the number of bedrooms into account. Prices for ADUs rented to non-related tenants are similar in price to or more expensive than one-bedroom rental units in the same neighborhood.

After factoring in the tenant-homeowner relationship and the size of the unit, ADUs do not appear to be a low-cost alternative to other rental units. A caveat to this finding is that ADUs are a form of infill housing in low-density neighborhoods that have comparatively few other rental options. For individuals or couples interested in the amenities of a single-family neighborhood, ADUs are a low-cost alternative to a single-family home.

Conclusion

California legislators face a dilemma: how do they increase affordable housing without antagonizing homeowners, a powerful political force in the state? The affordable housing shortage is decades in the making, so resolving the housing crisis will not be easy. To contend with demand for more housing, California legislators changed housing regulations (effective 2017) to enable more homeowners to permit accessory dwelling units (ADUs) on single-family parcels. This legislation attempts to strike a balance between increasing housing across the state and appeasing homeowners. The policy change doubles the allowable parcel density in single-family neighborhoods without changing the architectural character of the neighborhood—or seriously challenging the firmly entrenched “not in my backyard” (NIMBY) mentality. Even low-scale attempts to increase housing density in high-income neighborhoods, like enabling ADU construction, prompt homeowner concerns about decreased home values and increased congestion.

The City of Los Angeles has around a half a million single-family homes, so at face value, the legislation change has the potential to significantly increase the number of housing units in the city. And easing regulations led to a sharp increase in the number of permits homeowners pulled to build ADUs in Los Angeles; from 2016 to 2017, the number of permits pulled rose 2000%. With an increase in the housing supply, housing prices should stabilize, increasing affordability. But ADUs are unlike other types of housing, and there are two reasons why the recent increase in permits might not result in more affordable housing on the market: first, a home is more than investment asset, and some homeowners may prefer to maintain the home as a private space; second, using an ADU as a short-term rental offers a more flexible and potentially more lucrative way of making money. The future potential of ADUs is further limited

due to an estimated 50,000 to 200,000 unpermitted ADUs already on single-family parcels in Los Angeles.

Research on ADUs frequently focuses on the important role ADUs could provide to homeowners and renters if regulations were less severe. Underlying this research is an assumption that ADUs are like other housing: easing regulations will result in a widespread increase in ADU production and those ADUs will contribute to the long-term rental housing supply. My findings dispute the assumption that ADUs are like other types of rental housing.

In chapter 1, I determine where unpermitted housing units are in the city. Unpermitted ADUs are a potential supply constraint for future permits (only one ADU is allowed on a parcel currently). Unfortunately, existing measures do not capture unpermitted ADUs in Los Angeles at a granular scale. Using a variation on existing methodologies, I enumerate unpermitted housing units at the census block group level by comparing housing totals from the decennial census and the Los Angeles County Office of the Assessor. While the figures represent a difference in units with permits and total housing units, the method has one serious limitation: it measures all unpermitted housing units rather than specifically capturing unpermitted ADUs. Future research on unpermitted ADUs would better identify this form of unpermitted housing by using this measurement tool at the household level.

High rents incentivize property owners to construct more rental units, but prior to the regulatory changes, high-income neighborhoods were more likely to restrict construction. In chapter 2, I examine pre- and post-regulation ADU in relation to geographic, socioeconomic, and demographic variables at the block group level to determine whether pre-regulation permits were blocked in middle- and high-income neighborhoods, and whether post-regulation permits are more strongly associated with high median rent or non-monetary neighborhood characteristics.

Post-regulation permits were on average in slightly higher-income, whiter block groups than pre-regulation permits, suggesting that homeowners in middle- to high-income neighborhoods were constrained by local regulations. Interestingly, high rents in a neighborhood are less important in determining where ADUs are permitted than the percent of households in the neighborhood with non-related people.

The 2017 regulatory change was made in part to add low-cost housing to the housing supply. However, not all homeowners treat their house primarily as an investment asset that they can use to supplement their income. Rather, a house is also a private space, and for some homeowners, additional income is not enough of an incentive to lose privacy and control over their home by sharing it with a stranger. Chapter 3 presents the results of a survey of homeowners with ADUs, specifically focusing on how homeowners use their ADU, and for those who rent it out, what they charge in rent. While homeowners overwhelmingly use their ADU as a long-term residence, about a third of homeowners have no interest in sharing that space with someone other than a family member or friend. This is particularly true for homeowners with very high household incomes. The survey results indicate that approximately two-thirds of ADUs will be used as long-term at some point, but homeowners with family members or friends living in the space may not be willing to turn their unit into a rental unit should the family member or friend move out.

Proponents of ADUs argue that ADUs provide a low-cost housing option in single-family neighborhoods. For homeowners renting their space to family and friends, this is certainly true. Most homeowners renting their property out to family do not charge rent for the unit. And even those homeowners who charge family and friends, rental prices are generally below market rates.

This is not true for homeowners renting to strangers: homeowners charge non-related tenants slightly higher rents than similarly sized units in their neighborhood.

Housing policy in Los Angeles is a hot political topic, and many survey participants expressed strong opinions on the topic of ADU usage—either on the survey or in phone calls to me. A few homeowners stressed that their ADU is part of their private property, and that using it as a short-term rental should be a personal choice rather than subject to municipal ordinances. Another group of homeowners framed the use of their ADU as a long-term rental as a public good in the face of a housing crisis. Regardless of how homeowners frame their use of the property, the use of the property is still a decision that homeowners make on a household by household basis. And properties held by resident landlords do not follow the same economic patterns as other rental properties—ADUs do not automatically join the rental market. Some homeowners view ADUs as an economic opportunity. Renting out a unit can supplement the income. Or by renting to family members or friends, homeowners can also share responsibilities, like childcare or home maintenance. But for those households not driven by economic necessity to add their ADU to the rental market, the flexibility the space provides is in of itself an incentive. It can meet whatever need arises, functioning as a guesthouse, office space, occasional rental unit, or long-term residence for family members, friends, or caretakers. And ADUs have the added benefit of potentially increasing the house’s value in the future.

Homeowners also benefit from being put in charge of decisions about the future of housing in their neighborhood and city. ADUs keep homeowners in control over who moves into the neighborhood to access local amenities. Not all homeowners are willing to cede their private property to long-term residents, particularly if they have no financial or familial obligations to do

so. Homeowners hold the position of gatekeeper, determining when to construct an ADU, whether to use the ADU as housing, and who gets to live in the unit.

ADUs offer benefits to renters. ADUs, while not more affordable than similarly sized units, are generally more affordable than single-family homes. Renters who are otherwise unable to afford housing in middle- to high-income single-family neighborhoods can access the amenities those neighborhoods provide by renting an ADU. For an aging population, ADUs provide a semi-independent living space in close proximity to family, friends, or caretakers—a more attractive option than retirement or nursing homes for many.

For cities, ADUs increase parcel density in areas zoned for single-family housing. And given the difficulty of increasing density in these areas in cities like Los Angeles, adding ADUs is a step toward eventually meeting the demand for housing in the city.

For California legislators, focusing on ADUs as a source of new housing gives them the appearance of working to increase housing across the state, and without antagonizing their homeowner constituents in the process. However, realistically, ADUs have a rather limited ability to improve housing conditions in cities like Los Angeles. Given that of the half million SFR parcels, a substantial number likely already have an unpermitted secondary unit, the actual number of SFR parcels available for an ADU is anywhere between 300,000 and 450,000. If every homeowner with an available SFR parcel built an ADU, a significant amount of the demand for housing in the City would be met. However, not all these homeowners would choose to use their ADU as a long-term residence, further limiting the potential number of new ADUs on the market. This is not to say that increasing the number of ADUs has a negative effect on the city's housing; simply, the benefits are not commensurate with the level of attention they receive.

One potential way in which ADUs could potentially detract from achieving future housing goals is that homeowners may more vehemently oppose other regulations to increase density in low-density neighborhoods. For instance, some homeowners might take the position that renting out their ADU means that they are already doing their part to resolve the housing crisis. However, NIMY opposition to new housing is already quite strong in high-income neighborhoods, leaving little room for more opposition.

This research brings several new questions to mind for future research on ADUs. For example, do ADUs increase race and age integration in single-family neighborhoods? Some proponents of ADUs suggest that this housing type will lead to more integration of mostly white, single-family neighborhoods. However, this assumes that homeowners will look for tenants outside of the social milieu. But homeowners expressed serious concerns about bad tenants taking advantage of lenient rental rules and squatting in the ADU. Given this concern, homeowners are more likely to be extremely discriminating in choosing a tenant, and middle- to high-income white professionals are more likely to benefit from this selectiveness.

Another research question focuses on the results of the 2008 foreclosures, which led to more investment firms buying up single-family housing to use as rental properties. In the door-to-door survey, a few participants mentioned that both the main house and the ADU were renter-occupied and that the property owner lived elsewhere. Future research needs to explore whether houses with ADUs account for a significant portion of the investment-backed rental market, and what the implications are for renters and the city overall.

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