

Exploring the Changing Faces of Housing Development and Demand in California: Millennials,
Casitas, and Reducing VMT

By

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ABSTRACT

Changes are coming to housing development and demand in California. The state’s sprawling development patterns have come under increasing scrutiny as the state struggles to reduce its greenhouse gas emissions, abate a decades-long housing supply and affordability crisis, and meet the needs of the largest generation in American history – the millennials (Generation Y). In this dissertation, I explore three ways in which residential development and demand in California could change going forward.

In my first study (Chapter 2 of this dissertation), I investigate how an upcoming change in California’s project-level environmental review law (the California Environmental Quality Act or CEQA) could affect the approval process for urban development. The state recently mandated that local, regional, and state agencies must replace “level of service” (LOS) with vehicle miles traveled (VMT) as the primary measure – and basis for mitigation – of transportation impacts under CEQA by July 1, 2020. I use a historical counterfactual approach to assess how replacing LOS with VMT could have impacted the approval process for 153 land development projects over 16 years in the City of Los Angeles. I find that most projects could have qualified for at least some environmental review streamlining under the VMT-based framework recommended by the state, including over 75 percent of residential-containing projects. My results suggest that swapping LOS for VMT could reduce the environmental review burden for development in urban areas and provide some of the approval process streamlining necessary to increase housing production in California. And because the streamlined development would be in areas characterized by lower VMT per capita than the regional average, it would likely contribute to reducing VMT per capita in line with state targets.

In my second study (Chapter 3 of this dissertation), I look at accessory dwelling units (ADUs). How much ADUs can help with California's housing supply and affordability crises depends on the homeowners who do not yet own one – their willingness and ability to build an ADU will determine the ceiling for ADU construction. I use a survey of 502 single-family homeowners in the Sacramento metropolitan area to investigate homeowners' willingness to consider building an ADU, and the motivations and barriers they face. I find that as many as 54.1% of Sacramento city single-family detached homeowners could either have an ADU or be open to creating one. Familiarity with ADUs has the strongest association with openness to building an ADU in my logistic regression model. And homeowners' top-ranked motivation for creating an ADU is housing family or friends. Cost-related concerns ranked as the biggest obstacles to creating an ADU, followed by permitting and regulatory issues. My findings suggest that ADUs have significant potential to help California close its housing supply gap.

In my third study (Chapter 4 of this dissertation), I explore how millennials – people born between 1982 and 2000 – choose where to live. Surveys suggest that millennials have a stronger preference than previous generations for urban amenities. But studies also indicate that most millennials will eventually settle in a suburb. That raises big questions for urban planners and policymakers, as well as for the future of sustainable urbanism. If most millennials will end up suburbanizing, what happens to their erstwhile preferences for urban amenities? Do they seek out suburban neighborhoods with urban amenities? Do their preferences simply change with time and major life events? I use in-depth interviews of 20 households who recently purchased homes in the San Francisco Bay Area to explore how millennials choose where to live when they reach the life cycle stages typically associated with bigger homes in suburban areas. I find that life cycle effects emerged in different ways for the households I interviewed. As they partnered and

began having or thinking about having children, most households suburbanized or planned to suburbanize in the future. The households still *valued* urban amenities, but they generally did not *prioritize* urban amenities when searching for their suburban homes, with one exception – proximity to commuter transit.

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1. INTRODUCTION

Since World War II, achieving the “American Dream” has become nearly synonymous with owning a single-family house with a big yard in a nice suburb, with a car or two parked in the garage (Muller, 2004; Myers & Gearin, 2001). That dream has powerfully shaped development across the United States. The stock of single-family houses in U.S. metropolitan areas began skyrocketing after World War II, fueled by governmental policies promoting homeownership – from exclusionary zoning to the GI Bill to the mortgage interest tax deduction (McCabe, 2016). Detached single-family homes now constitute over 61% of the nation’s housing units (U.S. Census Bureau, 2018a).

The boom in single-family home construction and the concomitant rise in the nation’s homeownership rate have allowed millions of Americans to build household wealth through housing (McCabe, 2016). But the benefits have not been shared equally amongst racial, ethnic, and income groups – indeed, through redlining and other means, Blacks, Hispanics, and other racial and ethnic groups have been actively excluded from the benefits of homeownership in many cases (Dougherty, 2020; McCabe, 2016; Rothstein, 2017). Beyond the racial inequities of homeownership in America, suburbanization has also had significant negative consequences. The lateral spread and preferential regulatory treatment of single-family homes have exacerbated global warming and aggravated the housing supply and affordability crises facing numerous metropolitan areas across the U.S. (Busch, Lew, & Distefano, 2015; California Air Resources Board, 2016; Dougherty, 2020; Manville, Monkkonen, & Lens, 2020; McCabe, 2016; Monkkonen, Lens, & Manville, 2020; Office of Planning and Research, 2017; UC Davis Policy Institute for Energy Environment and the Economy, 2015; Volker, Lee, & Fitch, 2019). These negative effects have been particularly pronounced in California.

With respect to global warming, 41% of California's anthropogenic greenhouse gas emissions (GHGs) come from the transportation sector (California Air Resources Board, 2019). Technology will play a big part in reducing transportation-related GHG emissions via alternative vehicles and fuels. But without also reducing vehicle miles traveled (VMT), California will likely not achieve its GHG emissions reduction goals (Busch, Lew, & Distefano, 2015; California Air Resources Board, 2016; Office of Planning and Research, 2017; UC Davis Institute for Policy, Environment and the Economy, 2015). And one of the primary drivers of increased VMT is automobile-centric land development patterns, especially in the U.S. (Muller, 2004; Salon, 2014). Studies show that residents of denser, mixed-use and transit-rich areas drive less than their suburban and rural counterparts (Arrington & Cervero, 2008; Ewing & Cervero, 2010; Haas, Morse, Becker, Young, & Esling, 2013; Stevens, 2017; Transportation Research Board, 2009). But densifying is difficult, particularly in California, where urban land is expensive, zoning can be restrictive, and not-in-my-backyard (NIMBY) opposition to developing in single-family neighborhoods runs deep (Dougherty, 2017, 2020).

Those same impediments to developing housing beyond single-family detached homes are a major reason for California's epic housing supply and affordability crisis. The state ranked 49th in the U.S. in housing units per capita in 2018 (U.S. Census Bureau, 2018b). That same year, only 27 percent of California households could afford to purchase a median-priced single-family home (California Association of Realtors, 2018). And there are not enough rental units to affordably house those households that cannot afford to purchase a house. The state needs 1.3 million more affordable rental units to meet demand, according to one estimate (California Housing Partnership, 2020). And Governor Newsom has a goal of adding 3.5 million housing units total by 2025 (Dillon, 2019b; Woetzel, Mischke, Peloquin, & Weisfield, 2016). But

exclusionary zoning, expensive and time-consuming development approval processes, and neighborhood opposition to new development continue to stymie efforts to achieve those goals (Gyourko & Molloy, 2014; Monkkonen et al., 2020; O’Neill, Gualco-Nelson, & Biber, 2018; Volker, Lee, et al., 2019).

It is thus no surprise that California’s sprawling development patterns have come under increasing scrutiny as the state struggles to reduce its greenhouse gas emissions, abate its decades-long housing supply and affordability crisis, and meet the needs of the largest generation in American history – the millennials (Generation Y). But questions remain as to whether (1) governmental policies will go far enough to enable a significant increase in housing development in lower-VMT urban areas, (2) existing homeowners will accept densification of single-family neighborhoods, and (3) prospective homebuyers – especially millennials – want to live in the prototypical suburb of the American Dream or something more urban. I explore these three questions in this dissertation.

In my first study, I investigate a recent change in the state’s project-level environmental review law, and how that change could affect the approval process for urban development. The change involves the way in which local governments analyze the transportation impacts of land use developments. For over 50 years, “level of service” (LOS) – a measure of automobile traffic congestion – has dominated transportation impact analysis under the California Environmental Quality Act (CEQA). In that role, LOS has exacerbated the state’s notoriously tortuous development approval processes, particularly in urban areas. But LOS is on its way out. The state recently replaced LOS with VMT as the primary measure – and basis for mitigation – of transportation impacts under CEQA. Local governments must make the switch by July 1, 2020. My co-authors and I use a historical counterfactual approach to assess how replacing LOS with

VMT impacted the approval process for 153 land development projects over 16 years in the City of Los Angeles.

We find that most projects could have qualified for at least some environmental review streamlining under the VMT-based framework recommended by the state, including over 75 percent of residential-containing projects. Our results suggest that swapping LOS for VMT could reduce the environmental review burden for development in urban areas and provide at least some of the approval process streamlining necessary to increase housing production in California. And because the streamlined development would be in areas characterized by lower VMT per capita than the regional average, it would likely contribute to reducing VMT per capita in line with state targets (California Air Resources Board, 2018).

The manuscript for my first study comprises Chapter 2 of this dissertation. My co-authors – Amy E. Lee and Dillon T. Fitch – and I published a substantially similar version of the manuscript in the *Journal of the American Planning Association*, volume 85, issue 2 (Volker, Lee, et al., 2019).

In my second study (Chapter 3 of this dissertation), I look at accessory dwelling units (ADUs). ADUs have been an integral part of the urban fabric of cities across the United States for over 100 years, providing relatively affordable housing and facilitating multigenerational living. ADUs largely dropped off the policymaking and media radar around World War II as cities suburbanized and used zoning to exclude ADUs from single-family neighborhoods. But ADUs are once again a hot topic, as planners, policymakers, and advocates seek solutions to housing shortages, rising housing costs, and other problems. How much ADUs can help with these societal and environmental problems depends on the homeowners who do not yet own one – their willingness and ability to build an ADU will determine the ceiling for ADU construction.

I use a survey of 502 single-family homeowners in the Sacramento metropolitan area to investigate homeowners' willingness to consider building an ADU, and the motivations and barriers they face.

I find that as many as 54.1% of Sacramento city single-family detached homeowners either have an ADU already or are open to creating one. My logistic regression model indicates that familiarity with ADUs has the strongest association with openness to building an ADU. My exploratory analysis shows that homeowners' top-ranked motivation for creating an ADU is housing themselves, their family or their friends in the future. Cost-related concerns ranked as the biggest obstacles to creating an ADU, followed by permitting and regulatory issues. My findings suggest that ADUs have significant potential to help California close its housing supply gap. California's recent relaxation of ADU regulations should reduce many of the barriers reported by homeowners, particularly if combined with educational programs and permit process streamlining. Similar results could potentially also occur from similar actions in jurisdictions outside of California. However, construction costs and obtaining financing will likely continue to be major impediments to widespread ADU production without changes in lending practices. Those financial barriers also highlight the inequalities of homeowner access to ADUs, and underscore a need for programs to provide ADU funding assistance to low-income households.

In my third study (Chapter 4 of this dissertation), I explore how millennials choose where to live. Millennials – people born between 1982 and 2000 – will drive the California and United States housing markets for years to come. The question is how. Surveys suggest that millennials have a stronger preference than previous generations for urban amenities, like neighborhood walkability, shorter commutes, transportation alternatives, and proximity to shops, restaurants, and other activities. But studies also indicate that suburban populations will continue to grow –

even many of the millennials who currently live near urban cores could eventually decamp to the suburbs when they get married, have children, or simply achieve sufficient financial stability to purchase a home. That raises big questions for urban planners and policymakers, as well as for the future of sustainable urbanism. If most millennials will end up suburbanizing, what happens to their erstwhile preferences for urban amenities? And how do millennial households balance any such urban preferences against other household needs, dreams, or expectations? Do they seek out suburban neighborhoods with urban amenities? Do their preferences simply change with time and major life events? I use in-depth interviews of 20 households who recently purchased homes in the San Francisco Bay Area to explore how millennials choose where to live when they reach the life cycle stages typically associated with bigger homes in suburban areas.

I find that life cycle effects emerged in different ways for the households I interviewed. As they partnered and began having or thinking about having children, most households suburbanized or planned to suburbanize in the future. The households still valued urban amenities, but they generally did not prioritize urban amenities when searching for their suburban homes, with one exception – proximity to commuter transit. The widespread importance of transit access amongst the suburbanizing households highlights the inextricable link between transportation and land use, as well as the potential for millennials to age and suburbanize while minimizing increases in vehicle miles traveled. However, millennials' preference for transit access could very well subside in the wake of the COVID-19 pandemic.

2. STREAMLINING THE DEVELOPMENT APPROVAL PROESS IN A POST- LEVEL OF SERVICE LOS ANGELES

2.1 ABSTRACT

Local governments across the United States have for decades relied on the auto-centric “level of service” (LOS) metric to analyze and impose exactions for the transportation impacts of land use developments. In California, LOS has dominated transportation impact analysis under the state’s project-level environmental review law. In that role, LOS has exacerbated the state’s notoriously tortuous development approval processes, particularly in urban areas. But LOS is on its way out. The state recently replaced LOS with vehicle miles traveled (VMT) as the primary measure – and basis for mitigation – of transportation impacts under the California Environmental Quality Act. Local governments must make the switch by July 1, 2020. We used a historical counterfactual approach to assess how replacing LOS with VMT could have impacted the approval process for 153 land development projects over 16 years in the City of Los Angeles. We found that most projects could have benefited from at least some environmental review streamlining under the VMT-based framework recommended by the state, including over 75 percent of residential-containing projects. Our results suggest that swapping LOS for VMT could reduce the environmental review burden for development in low-VMT urban areas and provide at least some of the approval process streamlining necessary to increase housing production in California. Similar impacts from an LOS-to-VMT switch could also potentially accrue outside of California under the right conditions, but more research is needed.

2.2 INTRODUCTION

Auto-centric suburbanization in the United States erupted after World War II (Muller, 2004). The interdependent explosion of automobiles and low-density development necessitated new methods for measuring transportation impacts and planning for the infrastructure needed to accommodate automobility. Many public agencies turned to transportation impact studies based on automobile “level of service” (LOS), a measure of vehicular congestion introduced in the 1965 Highway Capacity Manual (DeRobertis, Eeels, Kott, & Lee, 2014; Roess & Prassas, 2014). LOS has dominated transportation impact analysis ever since, with broad impacts (DeRobertis et al., 2014).

Transportation impact studies now pervade land use planning and development in the U.S. They are engrained in project-level environmental reviews in states like California, New York, Minnesota and Washington (New York Department of Environmental Conservation, 2012; Larson & Perrus, 2010; Washington Department of Ecology, n.d.). And thousands of communities across the U.S. require developers to provide or otherwise pay for infrastructure improvements – such as additional roadway capacity – based on proportional impact studies using LOS (Burge, Nelson, & Matthews, 2007; Been, 2005; Rappa, 2002; Fulton & Shigley, 2018).

With such widespread use in the land use planning and development processes, LOS impacts where development occurs, how much it costs, how it changes the built environment, and how people travel – an example of the “inextricable link” between land use and transportation (Handy, 2005). When “moving rubber-tired vehicles” is a “primary objective” (Institute of Transportation Engineers, 2010, p. 70), developers often must fund traffic flow improvement measures, or even lower the density of proposed developments to reduce auto

loading on the road network (Fulton & Shigley, 2018; Rappa, 2002). That, in turn, increases per-unit development cost (Been, 2005). It also incentivizes development at the urban fringe, rather than in denser urban areas, because there is cheaper land and less baseline congestion (Lee & Handy, in press; Barbour, 2015; UC Davis, 2015; Milam, 2012; Henderson, 2011). In addition, the sprawling development patterns and expanded roadway capacity combine to increase vehicle miles traveled (VMT) (Hymel, 2019; Duranton & Turner, 2011; Cervero & Hansen, 2002), and hamper transit and active transportation (DeRobertis et al., 2014).

Encouraging sprawl, making urban development harder and costlier, and increasing VMT are antithetical to the burgeoning shift towards planning for multi-modal accessibility and global warming resiliency (Lee & Handy, in press; Busch, Lew, & Distefano, 2015). They also exacerbate housing supply and affordability deficits (Taylor, 2015; Reid, Galante, & Weinstein-Carnes, 2017). As those consequences have become more apparent, the automobility zeitgeist has started to wane. Planners are looking for alternatives to LOS for guiding land use development.

California is particularly well primed for testing LOS alternatives, for two reasons. First, the state faces major policy challenges stemming in part from decades of planning for automobility. For one, substantial VMT reductions are likely needed to meet the state's ambitious decarbonization targets (Busch et al., 2015; California Air Resources Board, 2018). In addition, the state is mired in a historic housing supply and affordability crisis. It ranked 49th in the U.S. in housing units per capita as of 2014 (McKinsey Global Institute, 2016). Only 27 percent of California households could afford to purchase a median-priced single-family home in the third quarter of 2018, compared to 53 percent across the U.S. (California Association of Realtors, 2018). And between 2000 and 2014, the median rent increased 24 percent, while

median renter income dropped seven percent (California Housing Partnership Corporation, 2016).

Second, California is the first state to mandate a statewide shift away from using LOS to measure and direct mitigation for the transportation impacts of land use development.

California's legislature passed Senate Bill (SB) 743 in 2013 to more "appropriately balance the needs of congestion management with statewide goals related to infill development," active transportation, and "reduction of greenhouse gas emissions" (SB 743 §1 [b] [2]). SB 743 directed the Governor's Office of Planning and Research (OPR) to replace LOS as the primary measure of transportation impacts under California's project-level environmental review law, the California Environmental Quality Act (CEQA). OPR chose a metric based on VMT.

This study investigates how replacing LOS with VMT could affect one of the most frequently cited impacts of both auto-centric planning and CEQA – a longer, costlier and riskier approval process for urban development. We assess whether the switch could help streamline the environmental review and approval process for urban development and increase housing production in the state.

In the rest of the paper, we provide a primer on CEQA, examine the roles of CEQA, LOS, and SB 743 in California's development entitlement process, describe the historical counterfactual approach we used to study the effects on the approval process of swapping LOS for VMT in CEQA analyses, then present the implications.

In short, we applied OPR's recommended VMT-based screening tests to a 16-year sample of land development projects in Los Angeles (n=153), and compared the results to the LOS-based analyses and mitigation actually required for the projects. We also reviewed CEQA lawsuits filed against some of the projects. We found that nearly 63 percent of the studied

projects could have benefited from at least some environmental review streamlining under the proposed VMT-based framework, including nearly 40,000 proposed housing units. But we found no evidence that switching to VMT could have reduced litigation against the projects. Our findings suggest that the LOS-to-VMT switch could streamline the approval process for urban development in California. Similar impacts could also potentially result in other states or communities who decide to replace LOS with VMT as the primary measure of and basis for mitigating the transportation impacts of land use development.

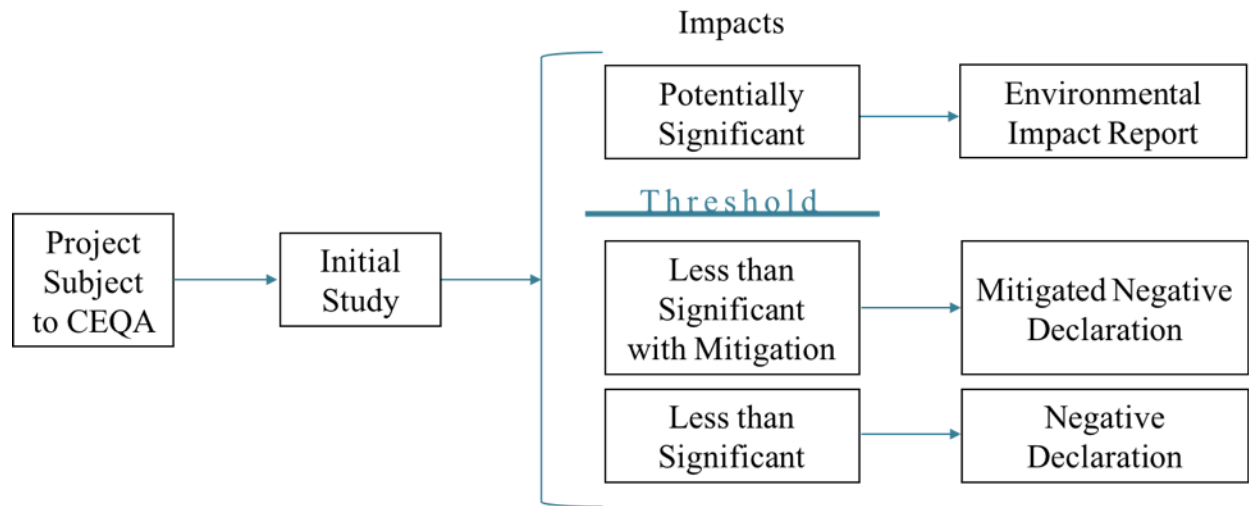
2.3 CEQA PROCESS PRIMER

CEQA is California’s version of the National Environmental Policy Act. It requires assessment and (unlike its federal counterpart) mitigation of the environmental impacts of a wide range of projects proposed to be undertaken, funded, or approved by public agencies within the state (Public Resources Code §21065). It is one of only a few state-adopted environmental review laws that apply to local government planning and development permitting actions (Ma, Becker, & Kilgore, 2009; Pendall, 1998).

CEQA applies to the thousands of land development projects that require discretionary approvals like conditional use permits, zoning changes, or general plan amendments, unless the project is otherwise exempted (Public Resources Code §21080 [a]; Olshansky, 1996a). CEQA does not apply to projects that only require “ministerial” approvals, like a building permit. And single-family residences, other small structures, some adaptive re-use projects, and even some larger infill projects meeting specific standards are exempt. But most large land development projects are subject to at least some level of CEQA review.

Figure 2.1 outlines the CEQA review process.

FIGURE 2.1 - California's Environmental Review Process



Once the “lead” permitting agency determines that a project does not qualify for an exemption and is subject to CEQA, it prepares an “initial study” to determine whether the project would have potentially “significant” environmental impacts, including transportation system impacts (14 California Code of Regulations [CEQA Guidelines] § 15063; CEQA Guidelines, Appendix G). Lead agencies have discretion to choose their own impact measures and “thresholds” beyond which impacts are significant. For transportation impacts, though, agencies almost uniformly use the LOS metric.

If the lead agency determines from the initial study that the project would have no significant environmental impacts, it may prepare a “negative declaration” (Public Resources Code § 21080). The agency may prepare a “mitigated negative declaration” if it determines that any potentially significant impact will be mitigated to a less-than-significant level (Public Resources Code § 21080). The agency must prepare a full “environmental impact report” (EIR) if the project might have a significant environmental impact. And it must mitigate or avoid that impact if feasible (Public Resources Code § 21002.1).

The CEQA process often ends once the lead agency approves the project. But not always. CEQA authorizes citizens to file lawsuits to enforce agency compliance with the law (Public Resources Code §§ 21168, 21168.5). If a court concludes the agency violated CEQA, which happens in nearly 50 percent of cases that reach the court of appeal, the court will usually set aside the project approvals until the agency undergoes additional CEQA review (Hernandez, 2018).

Table 2.1 provides a glossary of some of the key CEQA-related terms we use throughout the article.

TABLE 2.1 – Glossary of CEQA Terms

Term	Source
CEQA Guidelines	Administrative guidelines developed by OPR and the Natural Resources Agency that interpret CEQA and related court decisions.
CEQA Petition	The main document – a petition for writ of administrative mandamus – that commences a CEQA lawsuit.
Environmental Impact Report (EIR)	The most detailed analysis of environmental impacts potentially required under CEQA. Required where the initial study identifies “substantial evidence” that the studied project may have a “significant” environmental impact. The agency must then avoid or mitigate those impacts to the extent feasible.
Exemption	An exemption from CEQA (and its impact analysis and mitigation requirements) for a class of projects generally determined to not have significant environmental impacts (“categorical” exemption) or a specific project or type of project exempted by the legislature for any reason (“statutory” exemption).
Impact Significance Threshold	The level at which a project impact will be deemed “significant,” thus triggering the requirement for further analysis in an EIR or mitigative negative declaration, and associated impact mitigation. For transportation impacts, the primary significance threshold has historically been a minimum LOS “grade” for a given roadway segment or intersection.
Lead Agency	The agency with the greatest permitting authority over a proposed project, and which has primary responsibility for complying with CEQA.
Mitigated Negative Declaration	A written statement prepared by the lead agency describing why the studied project will not have a “significant” environmental impact after mitigation. Prepared in cases where the initial study identifies potentially significant project impacts, but the project proponent revises the project to mitigate the impacts to a less-than-significant level.
Negative Declaration	A written statement prepared by the lead agency describing why the studied project will not have a “significant” environmental impact. No environmental impact mitigation is required.
Office of Planning and Research (OPR)	Works with the Natural Resources Agency to develop the CEQA “Guidelines.” Maintains the State Clearinghouse, which maintains a database of CEQA documents and coordinates state-level CEQA review.
Screened Project	For purposes of this article: a project meeting one or more of OPR’s suggested VMT screening thresholds.
VMT Screening Threshold	VMT-based thresholds suggested by OPR below which a project would generally be presumed to not have a significant transportation impact, and thus not require a transportation impact analysis or related mitigation under CEQA. See Table 2.2 for specific thresholds.

2.4 CEQA AS AN IMPEDIMENT TO DEVELOPMENT

Because CEQA applies so broadly to local government planning and permitting actions, and because it requires mitigating impacts in addition to analyzing them, CEQA has arguably had “as much influence on land use patterns in California as any planning law” (Fulton & Shigley, 2018, p. 169). Olshansky (1996a, p. 313), one of the few researchers to empirically analyze CEQA practice, opined that CEQA might be the “most important law governing land-use planning in California.”

Opinions vary on what *kind* of impact CEQA has had. Some hail CEQA as a model of informed good government and a necessary environmental safeguard. On the flip side, the costs and uncertainties of CEQA compliance are frequently cited as impeding development, especially urban and affordable housing (Hernandez, 2018; Hernandez, Friedman, & DeHerrera, 2015; Reid et al., 2017).

The empirical jury is still out on whether CEQA contributes significantly to California’s housing crisis. Like other researchers, we found no studies that quantify the full cost and development impacts of CEQA compliance (Smith-Heimer et al., 2016; O’Neill et al., 2019). But CEQA compliance can unquestionably be costly.

The CEQA review process can take several months to several years, and frequently costs hundreds of thousands if not millions of dollars (excluding mitigation), which costs are primarily borne by the developer (Smith-Heimer et al., 2016; Barbour & Teitz, 2005; Landis et al., 1995; Hernandez, 2018; Rothman, 2011; Thomas, 1993). Those impact assessment costs might constitute only a minor portion of total costs for many projects (Smith-Heimer et al., 2016; Olshansky, 1996a). For example, Smith-Heimer et al. (2016) found that the environmental review costs ranged from 0.025 to 0.5 percent of total project costs across four case study

projects. But the range of CEQA process costs is wide, which creates risk. Reflecting that range in cost and burden, 32.9 percent of the 362 city and county planning departments surveyed by Olshansky (1996a) agreed that “EIRs cost too much, and are a burden to project applicants,” while 39.5 percent disagreed with the statement.

Impact assessment is also only one of many CEQA-related costs. Impact mitigation can increase development costs substantially. And the delays and overall uncertainty associated with the CEQA process – and risk of subsequent litigation – can be an even greater development deterrent (Hernandez, 2018; Reynolds, 2015; Rothman, 2011; Barbour & Teitz, 2005; Olshansky, 1996b).

With respect to CEQA lawsuits, the actual litigation rate appears to be fairly low. Two statewide studies (Olshansky, 1996b; Smith-Heimer et al., 2016) and one study of San Francisco (California Department of Justice, 2012) all found that lawsuits were filed against less than 1 percent of projects considered under CEQA. But when they happen, lawsuits can threaten project viability (Rothman, 2011).

Lawsuits can take years to resolve. And they subject developers to not only the cost of their own legal representation, but also sometimes the petitioners’ attorneys’ fees (Code of Civil Procedure § 1021.5). In addition, when a project opponent wins, courts will usually set aside the project approvals. Lawsuits can be so debilitating that the mere *risk* of litigation can stall projects before they are approved (Hernandez, 2018).

CEQA compliance can be especially time-consuming and expensive for urban development. Reynolds (2015) interviewed urban development practitioners about CEQA’s role in “infill development.” The respondents agreed that urban infill development is “harder than greenfield development,” due in part to CEQA-related delay, cost, and uncertainty (Reynolds,

2015, p. vi). One reported barrier to infill development was the use of LOS to measure transportation impact significance.

2.5 THE ROLE OF LOS IN IMPEDING DEVELOPMENT

LOS has been the principal measure of transportation impact significance under CEQA for nearly 50 years (OPR, 2013; *City of Orange v. Valenti*, 1974). In that role, LOS has increased the cost and frequency of CEQA review and mitigation, particularly for urban development.

For starters, projects causing congestion impacts are more likely to require EIRs, the most onerous form of CEQA review (Barbour & Teitz, 2005). Traffic is also the most frequently studied impact in EIRs, according to a 2002 analysis of 30 EIRs for land development projects in Alameda County (Jones, 2002), a 1975 review of 185 EIRs for projects across the state, and a 2018 three-EIR case study (Lee & Handy, in press). In addition, LOS impacts are sometimes the *only* significant impacts requiring EIR preparation (Henderson, 2011; Jaffe, 2014).

Studies also indicate that traffic-related mitigation measures are one of the most common types of mitigation imposed as part of an EIR or mitigated negative declaration (Barbour & Teitz, 2005). Jones (2002) found that on average nearly seven traffic-related mitigation measures were required for each of the 30 studied projects, nearly double the average for the next most numerous category of mitigation measures. Traffic impacts are also one of the most commonly litigated CEQA issues (Barbour & Teitz, 2005; Hernandez et al., 2015).

Urban development has been hit particularly hard by LOS-related costs and delays. LOS impacts are more common in urban areas – particularly urban cores – because roadways there are generally more congested at baseline than at the urban fringe or in rural areas (Milam, 2012; Ojuri, 2015; Reynolds, 2015). Congestion is also generally more expensive to mitigate in urban

areas, due to more constricted rights-of-way (Milam, 2012; UC Davis, 2015; Ojuri, 2015). And urban congestion affects more people, increasing the chance of project opposition (UC Davis, 2015). Henderson (2011, p. 1143) gives one example where the CEQA review for a San Francisco housing development plan took nearly four years and was “largely delayed because of LOS.”

2.6 PREVIOUS STREAMLINING EFFORTS

To help alleviate California’s housing crisis and achieve the state’s greenhouse gas emission reduction goals, practitioners have long advocated for CEQA streamlining for urban development (Smith-Heimer & Hitchcock, 2019; Barbour & Teitz, 2005; Landis, 2004). Over 60 percent of a sample of city and county planning directors surveyed in 2011 considered “CEQA streamlining for infill development” to be “very important” to support the state’s climate change goals, more than for any other policy measure (Barbour & Deakin, 2012, p. 82). Yet observers commonly regard the available streamlining options as unable to “substantially alter business as usual” (Barbour & Deakin, 2012, p. 83).

Research indicates that developers can be hesitant to request, and planners can be reluctant to apply, existing CEQA streamlining provisions for urban development (Reynolds, 2015; Elkind & Stone, 2006). Some fear stoking neighborhood opposition by skirting CEQA review, while others may just be unaware of all the streamlining options (Elkind & Stone, 2006).

But likely the biggest impediment to CEQA streamlining for urban development is that it is difficult for projects to qualify, especially larger projects (Hernandez, 2018; Stahl, 2018; Reynolds, 2015; Rose et al., 2011; Carlin & Farabee, 2011; Elkind & Stone, 2006). Many streamlining provisions are so loaded with “eligibility restrictions [that] they apply only to a

‘mythical’ project” (Reid et al., 2017, p. 243) or to smaller developments (Smith-Heimer & Hitchcock, 2019).¹ Streamlining provisions need to be “more black and white,” as one attorney interviewed by Reynolds (2015, p. 81) put it.

Swapping LOS for VMT as CEQA’s primary transportation impact metric could help.

2.7 SB 743: REPLACING LOS WITH VMT

Senate Bill 743, and the recently promulgated regulations and guidance that implement it,² replace LOS with VMT as the “most appropriate metric to evaluate a project’s transportation impacts” (OPR, 2018, p. 1). They require lead agencies to adopt a VMT-based transportation impact threshold for CEQA review by July 1, 2020. Lead agencies have discretion to choose their own thresholds of VMT impact significance, but many local governments are likely to use the approach recommended by the Office of Planning and Research, at least as a starting point.³

OPR recommends two levels of review for land development projects (OPR, 2018). The lead agency would first conduct a “screening analysis.” If the project meets the “screening thresholds,” its transportation impacts would generally be considered less than significant, and a detailed transportation impact analysis would likely not be required. If the project could not be “screened,” the agency would conduct a more detailed analysis to determine whether the transportation impacts would be significant and require mitigation.

The LOS-to-VMT switch holds potential to streamline the urban development approval process for two reasons. First, urban development is less likely to cause significant VMT impacts than significant LOS impacts. Second, OPR’s recommended screening thresholds are relatively easy to apply, in contrast to the more time-intensive LOS analysis previously required for

determining transportation impact significance, and the more complicated or ambiguous requirements of many existing streamlining options.

We report and apply the screening criteria only – and not the thresholds recommend by the Office of Planning and Research for non-screened projects – because they are the type of black-and-white thresholds that legal commentators have opined are necessary to make CEQA review easier, quicker and cheaper (Mackey, 2014; Reynolds, 2015; Thomas, 1993). Table 2.2 details OPR’s recommended screening thresholds for residential, office and retail development projects.

TABLE 2.2 – OPR’s Recommended Screening Thresholds for Land Development Projects

Screening Type	Screening Threshold
Small Project	Projects generating <110 vehicle trips per day (OPR, 2018)
Low-VMT Area - Office	Office projects located in areas with low VMT, and that incorporate similar features to their surrounding area (density, mix of uses, transit accessibility). Low-VMT areas are areas, like transportation analysis zones (TAZs), with an average VMT per employee below 85% of the existing regional VMT per employee (OPR, 2018).
Low-VMT Area - Residential	Residential projects located in areas with low VMT, and that incorporate similar features to their surrounding area (density, mix of uses, transit accessibility). Low-VMT areas are areas, like TAZs, with an average VMT per capita below 85% of the existing regional VMT per capita (OPR, 2018).
Small Retail	Retail development without any stores larger than 50,000 square feet in size (OPR, 2018).
Projects Near Transit	Residential, retail and office projects – and projects with a mix of those uses – “proposed within ½ mile of an existing major transit stop or an existing stop along a high quality transit corridor” unless project- or “location-specific information indicates that the project would still generate significant levels of VMT” (OPR, 2018, pp. 13-14).
Affordable Infill Housing	100-percent affordable residential projects in infill areas (OPR, 2018).

For mixed-use projects, the Office of Planning and Research advises lead agencies to either “evaluate each component of [the] project independently and apply the significance

threshold for each project type included,” or “consider only the project’s dominant use” (OPR, 2018, p. 17).

Four jurisdictions have already adopted VMT-based thresholds: Pasadena, San Francisco, Oakland and, most recently, San Jose.⁴ A few others, like the City of Los Angeles (Los Angeles), are poised to adopt VMT-based thresholds soon (Los Angeles, 2019).

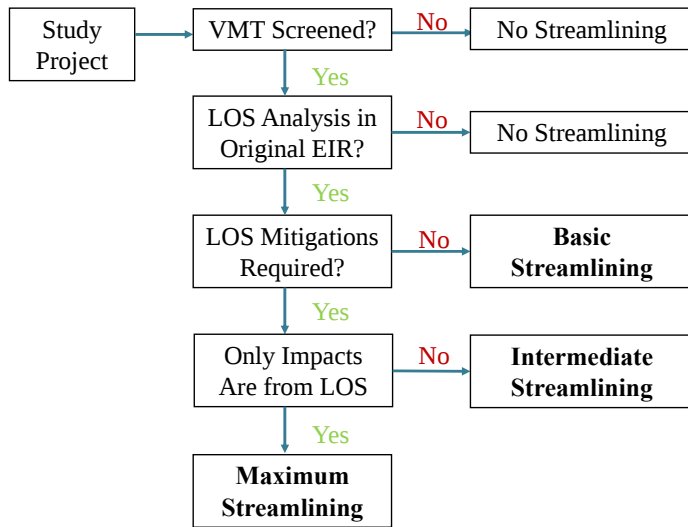
2.8 OUR HISTORICAL COUNTERFACTUAL APPROACH

Because most local governments still use LOS to measure transportation impacts in their CEQA analyses, little data exists on how a VMT metric has been used in practice, let alone how it has affected land development. So, we used a “counterfactual history” approach to assess the potential impacts on the development approval process of replacing LOS with VMT.

We first collected published EIRs for a sample of land development projects in Los Angeles. That allowed us to document the actual environmental analyses done and mitigation required for the projects. We then applied OPR’s VMT screening methods to the projects to gauge, counterfactually, whether CEQA transportation impact analyses would have been required for the projects using a VMT-based impact measure. “Screened projects” are projects that could have met the screening thresholds and thus avoided a CEQA transportation impact analysis.

To determine whether swapping LOS for VMT could have streamlined the environmental review for the screened projects, we reviewed the LOS-based analysis and mitigation actually required for the projects. “Streamlined projects” are screened projects that in reality required an LOS impact analysis, and thus could have avoided that analysis – and potentially more – in a post-LOS world. We discern three levels of streamlining, as the flowchart in Figure 2.2 shows.

FIGURE 2.2 – Environmental Review Streamlining Levels



“Basic” streamlined projects are screened projects that required an LOS impact analysis, but whose traffic impacts were not significant enough to require mitigation. “Intermediate” streamlined projects are screened projects that required – and thus could have avoided – both an LOS impact analysis *and* LOS-related mitigation. “Maximum” streamlined projects are screened projects that could have avoided the *entire* EIR process, because the only significant and unavoidable impacts reported in their EIRs were related to LOS. Table 2.3 summarizes the streamlining levels.

TABLE 2.3 – Levels of Project Streamlining

Streamlining Level	LOS Analysis Performed	Approval Process Impediment Avoided under a VMT-based Framework
None	None	None
Basic	LOS impacts analyzed, but impacts not significant enough to require mitigation	LOS impact analysis
Intermediate	LOS impacts analyzed, and substantive measures imposed to mitigate significant LOS impacts	LOS impact analysis and LOS-related mitigation measures
Maximum	LOS impacts analyzed, and substantive measures imposed to mitigate significant LOS impacts	LOS impact analysis, LOS-related mitigation measures and entire EIR process (because LOS impacts were the only potentially significant environmental impact identified)

We also collected and reviewed CEQA “petitions” filed in court during a portion of our study period (a “petition” initiates the CEQA lawsuit). That allowed us to determine if any of the studied projects could potentially have been further streamlined in a post-LOS world by avoiding post-approval litigation based on LOS impacts.

2.8.1 Study Setting

We selected as our target sample land development projects in Los Angeles for which draft EIRs were prepared between 2001 and 2016.

Los Angeles is a natural setting for this study. It is California’s most populous city, and also one of its densest urban areas (Ewing & Hamidi, 2014; Laidley, 2016).⁵ In addition, the state’s housing crisis is particularly pronounced in major metropolitan areas and coastal communities, like Los Angeles (O’Neill et al., 2019; Taylor, 2015). Between 2013 and 2015, the wider Los Angeles region also had the most CEQA lawsuits of any region, and accounted for 38 percent of CEQA lawsuits statewide (Hernandez, 2018).

The 16-year timeframe allowed a more representative assessment of SB 743's counterfactual impacts than a shorter-timeframe snapshot would have. It increased our project sample size (n=153), and also ensured a diversity of project types and contexts. Our sample includes projects proposed before, during and after the 2007-2010 subprime mortgage crisis.

2.8.2 Project Selection and Snapshot

Our study sample includes all residential, office and retail development projects in Los Angeles for which (1) a draft EIR was prepared between 2001 and 2016, and (2) we were able to obtain a copy of the draft EIR. While they could have also benefited from VMT screening, we did not include projects that only required mitigated negative declarations because there is no similarly complete database of those projects. We also omitted land use plans that did not include specific development proposals (e.g. general plan amendments, community plans, and most specific and master plans). We also omitted transportation projects and public utilities projects that did not include a residential, retail or office development component.

To determine which projects required EIRs, we started by reviewing the state's online "CEQAnet" database. CEQAnet provides summary information on all CEQA documents submitted to the state since 1990. CEQA does not require that all EIRs themselves be submitted to the state. But lead agencies must submit a notice of EIR preparation whenever they determine an EIR is required for a project (CEQA Guidelines § 15082 [a]). CEQAnet thus contains a record of every project for which the lead agency at least planned to prepare an EIR.

Between 2001 and 2016, lead agencies filed 325 notices of EIR preparation for projects in Los Angeles. About 215 of those notices pertained to development projects with a residential,

office, and/or retail component. We were able to locate the actual EIRs for 153 of those projects, either online or at the State Library in Sacramento.

Table 2.4 shows the project type breakdown for our final sample (n=153).

TABLE 2.4 – Breakdown of Project Sample by Land Use Type

Land Use Type	Number of Projects	Percentage of Total
Residential-Containing	99	65%
Residential	30	20%
Residential and Office	3	2%
Residential and Retail	36	23%
Residential, Office and Retail	30	20%
Non-Residential	54	35%
Office	27	17%
Retail	18	12%
Retail and Office	9	6%
Total	153	100%

From each project EIR, we culled pertinent project information, including name, assessor’s parcel number, land uses, square footage by use, residential units, daily vehicle trips generated (or attracted), type of significant environmental impacts (as categorized in the EIRs), and type of transportation-related mitigation measures imposed.

2.8.3 Screening for VMT; Searching for Streamlining

To gauge, counterfactually, whether CEQA transportation impact analyses would have been required for the 153 study projects using a VMT-based impact measure, we applied the relevant small-project, small-retail, map-based (office and residential) and affordable infill housing screening thresholds recommended by the Office of Planning and Research. We deemed mixed-use projects “screened” if they could have met at least one of the applicable screening thresholds.

Due to the ambiguous nature of the exceptions to the projects-near-transit screening threshold, which make objective application difficult, we did not apply it here (Rose, 2011;

Thomas, 1993). This might have caused a slight underestimation of how many projects could have been screened (and, for some, streamlined).

We used data on daily vehicle trips generated (or where applicable, attracted) from the project EIRs to determine whether the projects could have qualified for small-project screening. We used the total retail square footage reported in the EIRs as a conservative proxy to determine whether projects could have qualified for small-retail screening. We used the EIR-reported percentages of affordable housing units in residential-containing projects to determine whether the projects could have qualified for the affordable-infill-housing screening.

To apply the Office of Planning and Research's map-based screening thresholds to the study projects, we used modeled VMT data for 2010 from the California State Travel Demand Model Version 2.0 (Caltrans, 2015), which is one of the options OPR has recommended (OPR, 2016). We used the 2010 data rather than future year forecasts because they are the base year data for the state travel demand model, calibrated with data from the 2012 state household travel survey and the 2010 United States Census (Caltrans, 2014). Also, 2010 is close to the midway point of our study timeframe.

The state travel demand model provides modeled VMT data for home-based trips and home-based work trips aggregated to the statewide transportation analysis zone (TAZ) scale (mean TAZ population of 6,830). We used the TAZ shapefile from version 2.0 of the state travel demand model, the assessor's parcel numbers from the project EIRs, and the 2015 parcels shapefile from the County Office of the Assessor (Los Angeles County, 2015) to map the projects and associate them with the relevant TAZ polygons and VMT data. We assigned each residential-containing project the home-based VMT per capita for the TAZ in which it was located. We assigned each office-containing project the home-based work VMT per employee

for the TAZ in which it was located. Where a project spanned two or more TAZs, we used the higher average VMT.

We then established screening thresholds based on the Office of Planning and Research's recommendations. We first calculated regional VMT averages by aggregating the VMT data from the state travel demand model across all TAZs in the six-county region of the Southern California Association of Governments. For residential projects, we set the screening thresholds at 85 percent of the home-based VMT per capita for the region, as recommended by OPR (OPR, 2018). For office projects, we set the screening thresholds at 85 percent of the home-based work VMT per employee in the region, as likewise suggested by OPR. Table 2.5 shows the regional averages and our map-based screening thresholds.

TABLE 2.5 – Map-based VMT Screening Thresholds for Residential and Office Projects

	Home-based VMT per Capita (Residential Projects)	Home-based Work VMT per Capita (Office Projects)
Regional Average	13.2	15.7
Screening Threshold (85% of regional average)	11.2	13.3

Source: Caltrans (2015)

To determine whether the projects with residential or office components might have qualified for map-based screening, we compared the local VMT assigned to each project to the relevant thresholds in Table 2.5. After applying the VMT screening tests, we compared the results to the LOS-based analysis and mitigation actually required for the projects to determine whether swapping LOS for VMT could have streamlined – or lengthened – the development approval process.

2.8.4 Picking up the Litigation Trail

CEQA lawsuits against projects for which an EIR was prepared must generally be filed within 30 days after project approval, and in the trial (“superior”) court of the county in which the project would be located (Public Resources Code § 21167 [c]). Because EIR preparation precedes project approval, none of our studied projects would have been approved before 2001. CEQA petitions challenging any of the 153 projects would have thus been filed in 2001 or later in Los Angeles County Superior Court.

All CEQA petitions must be submitted to the California Attorney General’s Office, so we submitted a Public Records Act request to the office for electronic copies of all petitions filed in Los Angeles County Superior Court from 2001 onward (Public Resources Code § 21167.7). But the office could only provide a complete electronic set of petitions filed between January 1, 2013 and December 31, 2017 (N=292).

Our petition dataset should cover lawsuits filed against any of the 153 studied projects that were approved between December 2012 through November 2017. While we do not have approval data for all 153 projects, the December 2012-November 2017 approval timeline would conservatively include most of the studied projects whose draft EIRs were published between 2013 and 2016 (n=46), as well as earlier projects that underwent additional rounds of CEQA review or were otherwise stalled (n≥7).⁶ Our petition dataset allowed us to determine which of those projects were challenged in court on congestion-related CEQA grounds, and whether in a post-LOS world they could potentially have avoided litigation based on LOS-related impacts.

Our dataset also includes dozens of CEQA petitions unrelated to the 153 projects in our study, including challenges to land use plans, infrastructure projects, and agency actions

unrelated to land development, as well as challenges to projects for which EIRs were not prepared. We do not analyze those petitions in this paper.

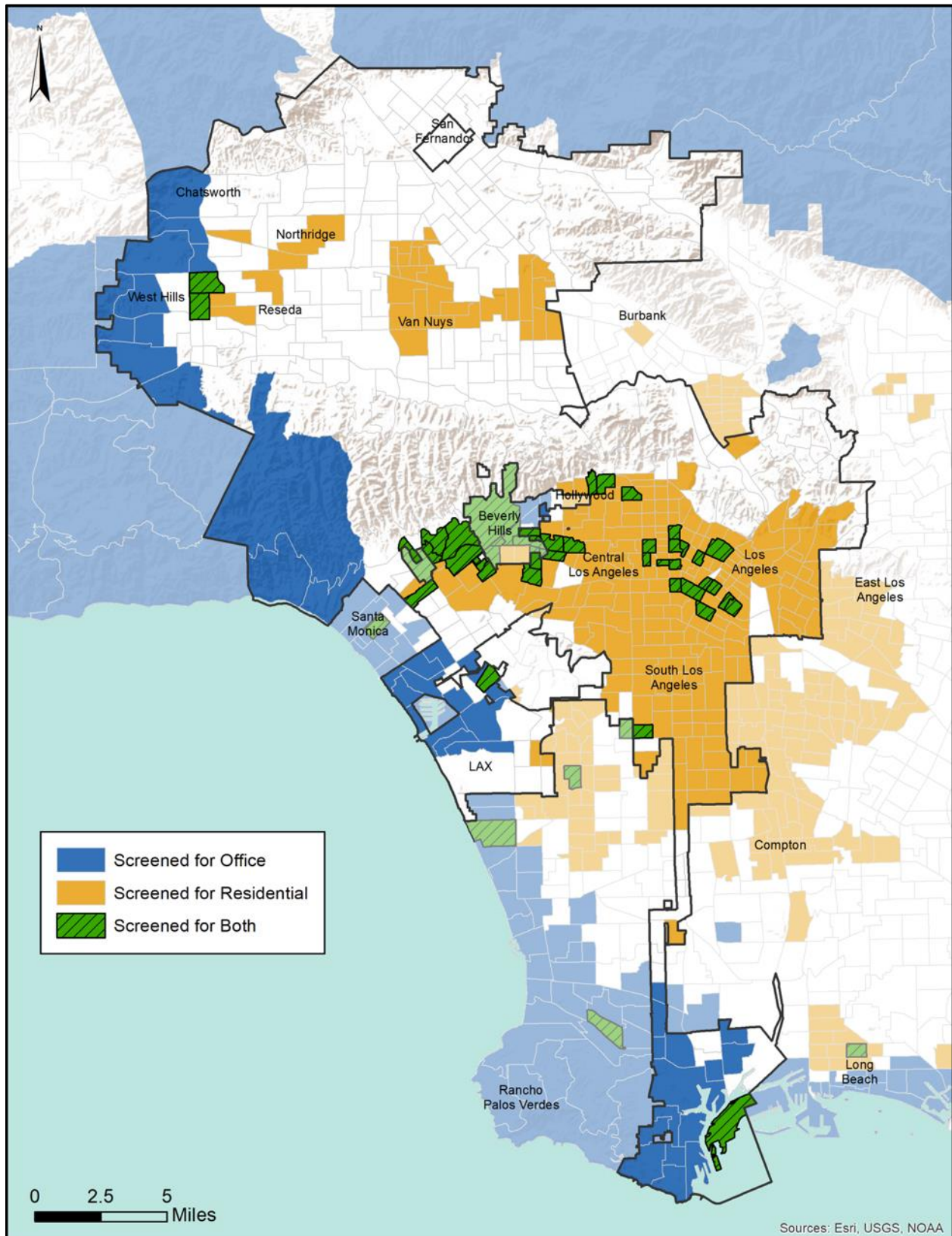
2.8.5 Limitations

Our counterfactual study is, by its nature, hypothetical. We cannot predict with certainty how replacing LOS with VMT will ultimately affect development within the state. Much depends on what type of VMT-based metrics local governments adopt pursuant to SB 743 (e.g. OPR’s suggested approach, or something else) and whether local governments continue to require LOS analysis and related exactions *outside of CEQA* or to placate project opponents. Nor can our specific findings be generalized outside of California because, by design, we are assessing the potential impacts of a California-specific policy change on the development approval process in the state. We also do not attempt to quantify or compare the costs – or the effects on built environment form – of LOS-related versus VMT-based mitigation measures. We suggest future research to fill these gaps at the end of the article.

2.9 MAPPING THE VMT SCREENING GEOGRAPHIES FOR RESIDENTIAL AND OFFICE PROJECTS

Figure 2.3 shows the TAZs within Los Angeles that would meet the Office of Planning and Research’s recommended map-based VMT screening thresholds – the low-VMT zones that allow residential or office projects to be “screened.” We found that residential screening zones would cover 25 percent of Los Angeles’ land area, and office screening zones would cover 21 percent. Combined, the two zones would comprise 43 percent of the city’s 500-plus square miles.

FIGURE 2.3 – Low-VMT Transportation Analysis Zones Meeting Map-based Screening Thresholds for Office and Residential Projects



2.10 APPLYING THE SCREENING THRESHOLDS TO THE PROJECTS

We applied the relevant small-project, small-retail, affordable-infill-housing and map-based screening thresholds to each of the 153 studied projects. We found that 99 (nearly 65 percent) of the 153 projects could have been screened, meaning their transportation impacts would likely have been considered less than significant under a VMT-based framework. For those 99 screened projects, the lead agencies could have avoided preparing – and the developers could have avoided paying for – CEQA transportation impact analyses. Table 2.6 breaks down the screening by project type.

TABLE 2.6 – Projects by Land Use Type and Screening

Land Use Type	Number Screened^(a)	Percent Screened
Residential-Containing (n=99)	76	77%
Residential (n=30)	13	45%
Residential and Office (n=3)	2	67%
Residential and Retail (n=36)	33	89%
Residential, Office and Retail (n=30)	28	93%
Non-Residential (n=54)	23	43%
Office (n=27)	9	33%
Retail (n=18)	8	44%
Retail and Office (n=9)	6	67%
Total (n=153)	99	65%

(a) “Screened projects” are projects that could have met OPR’s screening thresholds and thus avoided a CEQA transportation impact analysis.

We also compared the screening potential of the 99 residential-containing projects to that of the 54 non-residential projects. Table 2.7 shows that it is much more likely that the residential-containing projects would have been screened than the wholly non-residential projects.

TABLE 2.7 – Chi-squared Test for Difference in Screening Potential of Residential Projects Relative to Other Types of Projects

	Total Projects	Number Screened^(a)	Number Not Screened	Percent Screened
Residential-containing Projects	99	76	23	77%
Non-residential Projects	54	23	31	43%
$X^2 = 16.404$ (p-value < 0.000)				

(a) “Screened projects” are projects that could have met OPR’s screening thresholds and thus avoided a CEQA transportation impact analysis.

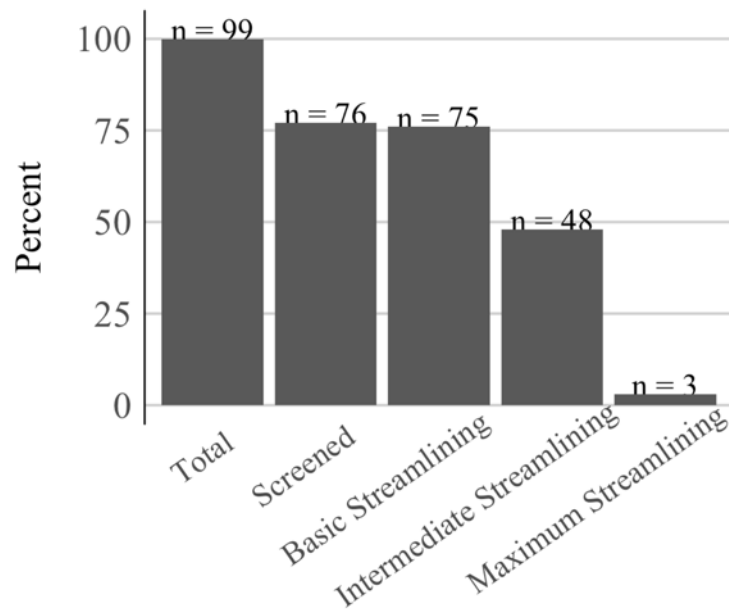
2.11 WHAT ABOUT STREAMLINING?

To determine whether swapping LOS for VMT could have *streamlined* the environmental review and approval process for the 99 screened projects, or lengthened the process for the 54 non-screened projects, we reviewed the LOS-based analysis and mitigation actually required for the projects.

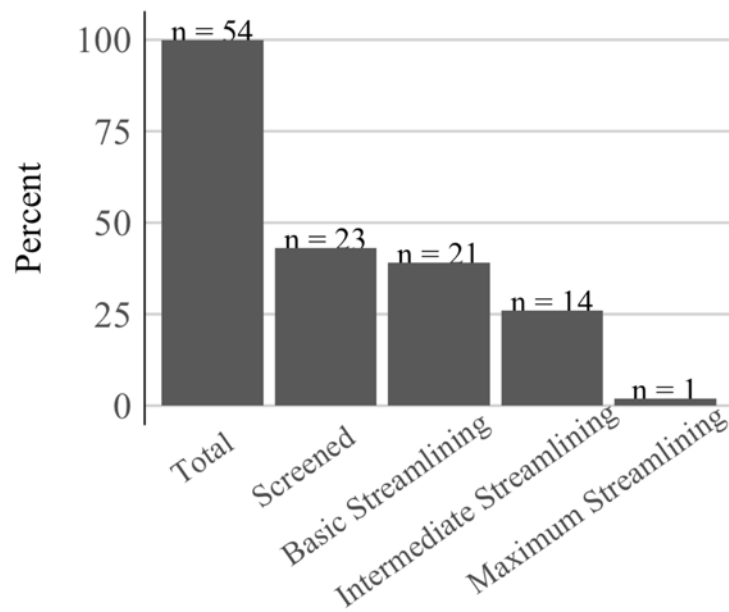
Figure 2.4 shows that 96 of the 99 screened projects (75 residential and 21 non-residential projects) could have benefited from at least basic streamlining under a VMT-based framework by avoiding CEQA analysis of LOS-related impacts. And 62 of the 96 streamlined projects (48 residential and 14 non-residential projects) could potentially have benefited from even greater (intermediate) streamlining because they could have avoided LOS impact analysis *and* the related LOS impact mitigations. The LOS-related mitigation measures imposed on those 62 projects ranged from through-lane additions and transportation demand management programs, to signalization and restriping.

Figure 2.4 also reveals that four of the 96 streamlined projects (three residential projects and one non-residential project) might have achieved maximum streamlining under a VMT-based framework by avoiding the EIR requirement entirely, along with the associated analytical costs, mitigation costs, and time delays. That is because the only significant and unavoidable impacts reported for those four projects were related to LOS. For projects with no potentially significant environmental impacts, the lead agency may prepare a negative declaration or mitigated negative declaration instead of an EIR.

FIGURE 2.4 – CEQA Screening and Streamlining Potential for Residential-containing Projects (top) Versus Non-residential Projects (bottom)



Residential-containing Projects



Non-residential Projects

Table 2.8 shows that the four maximum streamlined projects – the projects potentially avoiding an EIR entirely – totaled 1,347 residential units, 424,053 square feet of retail space, and 255,815 square feet of office space, as reported in their EIRs.

TABLE 2.8 – Characteristics of Projects Potentially Avoiding an EIR

Project Name	Project Type	DEIR Publication Date	Residential Units	Retail Square Footage	Office Square Footage	Project Ultimately Built
Museum of Tolerance Addition	Retail	2008	0	20,809	0	Yes
MGA Mixed-Use Campus Project	Residential, Office, Retail	2014	700	14,000	255,815	Under construction
Paseo Plaza Hollywood Project (now the Sears project)	Residential, Retail	2006	437	377,900	0	Not yet – delayed by lawsuit and project sale
Sunset & Everett Mixed-Use Development Project	Residential, Retail	2016	210	11,344	0	Approved, but not yet under construction
Total	-	-	1,347	424,053	255,815	-

Focusing on housing projects, Figure 2.4 shows that nearly 76 percent of residential-containing projects (75 of 99 total projects) could have been streamlined, compared to about 39 percent of non-residential projects (21 of 54 projects). Table 2.9 sums by level of streamlining the residential units reported in the project EIRs. Under a VMT-based framework, nearly 40,000 residential units in Los Angeles might have benefited from at least basic streamlining over the 16-year study period, an average of 2,500 units per year. That equals 28 percent of the average annual housing unit production in Los Angeles between 2001 and 2016 (U.S. Department of Housing and Urban Development, 2018). It is also more than three percent of the average annual

production in the entire state over the past 10 years – approximately 80,000 units (California Department of Housing and Community Development, 2018).

TABLE 2.9 – Characteristics of Residential-containing Projects by Level of Streamlining

	Number^(a)	Residential Units^(b)	Percentage of LA Housing Unit Production (2001-2016) ^(c)
Basic Streamlining	75	39,606	28%
Intermediate Streamlining	48	33,834	24%
Maximum Streamlining	3	1,347	1%

(a) These numbers are not additive across streamlining type. All projects that could have avoided an EIR (maximum streamlining) would have also avoided mitigation (intermediate streamlining). And all intermediate streamlined projects would have also benefited from basic streamlining (avoiding CEQA-required LOS impact analysis).

(b) Data from the EIRs for the streamlined project.

(c) Source: U.S. Department of Housing and Urban Development (2018).

Overall, our results indicate that 96 – nearly 63 percent – of the 153 studied projects might have benefited from at least basic streamlining under a VMT-based framework. By contrast, we found that only two of the studied projects might have required more transportation analysis using a VMT-based measure than was actually prepared in real life. The EIRs for those two projects – a single family residence and a high school redevelopment – neither identified any significant LOS-related impacts, nor contained a transportation impact study. Yet, the projects likely would not have qualified for VMT impact screening, meaning they likely would have required at least some transportation impact analysis rather than none.

An important caveat to the streamlining benefits discussed here is that LOS analysis and related exactions might still have been required *outside of CEQA* – by a local ordinance or plan, like Los Angeles County’s congestion management programs – for some of the 96 CEQA-streamlined projects. That said, going forward, the non-CEQA LOS analysis and mitigation

requirements may well change when jurisdictions adopt VMT-based impact standards for CEQA review, as will likely be the case in Los Angeles (Los Angeles, 2016).

2.12 WOULD SWAPPING LOS FOR VMT HAVE REDUCED THE LITIGATION BURDEN, TOO?

LOS-related impacts are some of the most commonly litigated CEQA issues. So, removing LOS impacts as a trigger for CEQA analysis and mitigation could potentially reduce CEQA litigation against congestion-inducing urban development projects. But our review of the available CEQA petitions challenging the studied projects indicates that switching from LOS to VMT might not have an appreciable impact on CEQA litigation.

The petition dataset likely does not cover every CEQA lawsuit filed against the 153 studied projects, as discussed above. But it should conservatively include any CEQA petitions filed against a sizeable subset of the projects ($n \geq 53$). In total, our dataset contains 28 petitions challenging 20 studied projects (some lawsuits challenged the same project), including 11 streamlined projects.

The petitions against 17 of the 20 total challenged projects include claims based on traffic-related impacts. But none of the lawsuits were based solely on LOS-related claims. They all included other CEQA claims, and most also included claims under different laws entirely. That indicates the lawsuits would likely have been filed anyway, even in a post-LOS world.

The results are not too surprising. Plaintiff-side land use attorneys frequently file “kitchen sink” petitions to maximize the chance of winning on at least one claim. Removing one arrow from their quiver of legal claims is not likely to change their calculus and cause them to

recommend against litigation. More likely, plaintiffs’ attorneys will find creative ways to challenge the projects on VMT instead of LOS grounds.

2.13 CASTING SB 743 INTO THE BROADER DEVELOPMENT PERMITTING DEBATE IN CALIFORNIA AND BEYOND

The automobility zeitgeist has begun to wane, as evidence mounts on the consequences of planning for automobility. But planners have not yet settled on an alternative to LOS for guiding land use development. One option is a VMT-based metric, as California is now experimenting with. Per SB 743, California’s local governments must soon swap LOS for VMT as the primary measure of transportation impacts under CEQA. The LOS-to-VMT shift could have wide-ranging impacts on land use development and form (Lee & Handy, in press). One of the most frequently cited impacts of both auto-centric planning and CEQA is that they make the approval process for urban development longer, costlier, and riskier.

We used a historical counterfactual approach to assess how replacing LOS with VMT could have impacted the approval process for 153 land development projects over 16 years in the City of Los Angeles. We found no evidence that switching to VMT could have reduced litigation against the projects. But we did find that nearly 63 percent of the studied projects could have benefited from at least some CEQA streamlining under the state’s suggested VMT-based framework, including over 75 percent of residential-containing projects. That means nearly 40,000 residential units – 28 percent of Los Angeles’ total housing production over the 16-year study period – potentially could have been streamlined through environmental review.

The results suggest that switching to VMT could reduce the environmental review burden for urban development and provide at least some of the approval process streamlining commonly

regarded as necessary to increase housing production in California (Reid et al., 2017; Stahl, 2018; Taylor, 2015). And our results could be conservative, for at least three reasons. First, we did not apply the transit-adjacent screening criterion, which provides an additional screening opportunity. Second, we only looked at projects requiring EIRs. Many more projects are approved with only mitigated negative declarations (Smith-Heimer & Hitchcock, 2019), and going forward they too could benefit from reduced transportation-related impact analysis and mitigation under a VMT-based framework. Third, it is possible that swapping LOS for VMT could make it easier for urban developments to qualify for other streamlining provisions, like the infill development exemption (CEQA Guidelines § 15332). That exemption’s requirement of no significant “traffic” impacts might no longer be enforceable under the VMT framework.

Some scholars contend that something more fundamental than CEQA is the root cause of the high costs and lengthy permitting times for California housing developments – discretionary review of development projects, which is generally a precondition for applying CEQA (O’Neill et al., 2019). That may well be true, but the CEQA process is a major piece of California’s lengthy, expensive and risk-ridden development entitlement process. And thus far, legislative efforts to restrict local governments’ discretionary review authority and increase ministerial permitting have failed either to be enacted or to have a widespread impact. For example, Senator Wiener’s ambitious proposal (SB 827) to override local zoning and allow dense development near transit stations “by right” died in its first committee hearing (Schneider, 2018). And the legislature has yet to vote on a revised bill (SB 50) that attempts to address some of the criticisms of SB 827. An earlier bill (SB 35) intended to streamline urban housing development by selectively prohibiting discretionary local review did pass. But SB 35’s many requirements can be onerous and ambiguous, which has already spawned litigation (Howard, Olhausen, & Walker,

2018; Kendall, 2018). The ultimate impact of renewed state-level attempts to limit discretionary project review remains unclear.

In the interim, our findings suggest that swapping LOS for VMT could help chip away at the delays and costs that continue to plague urban housing projects in California. These findings are, of course, specific to California. Nor can they presage how replacing LOS with VMT will ultimately affect development within the state. But the study does indicate how swapping LOS for an easy-to-apply VMT-based measure *could* streamline the approval process for urban development in California. Similar impacts could also accrue outside of California where, for example, a local government replaces its LOS-based measure for calculating transportation-related impact fees with a VMT-based screening tool that waives fees for development projects in low-VMT urban areas.

Future research will be needed to assess how SB 743 ultimately affects development, congestion, and VMT in California. Future research should also track efforts in other parts of the U.S. and the world to replace LOS with an alternative measure of and basis for mitigating the transportation impacts of land use development. A comprehensive survey on the costs of different transportation-related exactions and mitigation measures would help flesh out the impacts of replacing LOS.

2.14 NOTES

¹ According to a recent survey of 46 cities and counties, the exemption most frequently applied to housing projects between 2015 and 2017 was the small infill exemption, which limits projects to 5 acres (Smith-Heimer & Hitchcock, 2019; Guidelines § 15332). The exempted projects averaged 37 units in size.

² The SB 743-implementing regulations became effective on December 28, 2018. They include a new CEQA Guidelines section (15064.3) and revisions to Appendix G of the Guidelines, and are complemented by the Office of Planning and Research’s informal 2018 Technical Advisory on Evaluating Transportation Impacts in CEQA (Technical Advisory) (California Natural Resources Agency, 2019).

³ None of the 76 respondents to a recent SB 743-related survey conducted of city and county planning departments in California reported that they do not plan to use OPR’s recommended screening thresholds (Volker, Kaylor, & Lee, 2019).

⁴ Pasadena was the first to adopt a VMT-based policy in 2014 (City of Pasadena, 2015), followed by San Francisco and Oakland in 2016 (City of Oakland, 2017; San Francisco, 2016), and San Jose in 2018 (City of San Jose, 2018).

⁵ Los Angeles is frequently cited as the poster child for sprawl. But the city is actually one of the most compact urban areas in the U.S. according to recent metrics, even when combined with adjacent areas (Ewing & Hamidi, 2014; Laidley, 2016).

⁶ Our dataset includes seven petitions challenging projects whose draft EIRs were published before 2013, the earliest two from 2007.

3. CASITA, ANYONE? EXPLORING HOMEOWNERS' OPENNESS TO BUILDING ACCESSORY DWELLING UNITS

3.1 ABSTRACT

Accessory dwelling units (ADUs) have been an integral part of the urban fabric of cities across the United States for over 100 years, providing relatively affordable housing and facilitating multigenerational living. ADUs largely dropped off the policymaking and media radar around World War II as cities suburbanized and used zoning to exclude ADUs from single-family neighborhoods. But ADUs are once again a hot topic, as planners, policymakers, and advocates seek solutions to housing shortages, rising housing costs, and other problems. How much ADUs can help with these societal and environmental problems depends on the homeowners who do not yet own one – their willingness and ability to build an ADU will determine the ceiling for ADU construction. We use a survey of 502 single-family homeowners in the Sacramento metropolitan area to investigate homeowners' willingness to consider building an ADU, and the motivations and barriers they face. We find that as many as 54.1% of Sacramento city single-family detached homeowners either have an ADU already or are open to creating one. My logistic regression model indicates that familiarity with ADUs has the strongest association with openness to building an ADU amongst all explanatory variables. My exploratory analysis shows that homeowners' top-ranked motivation for creating an ADU is housing family or friends. Cost-related concerns ranked as the biggest obstacles to creating an ADU, followed by permitting and regulatory issues.

My findings suggest that ADUs have significant potential to help California close its housing supply gap. California recently relaxed ADU regulations statewide, which should reduce

many of the barriers reported by homeowners, particularly if combined with educational programs and permit process streamlining. Similar results could potentially also occur from similar actions in jurisdictions outside of California. However, construction costs and obtaining financing will likely continue to be major impediments to widespread ADU production without changes in lending practices. Those financial barriers also highlight the inequalities of homeowner access to ADUs, and underscore a need for programs to provide ADU funding assistance to low-income households.

3.2 INTRODUCTION

Accessory dwelling units (ADUs) have been an integral part of the urban fabric of cities across the United States and elsewhere for over 100 years, providing relatively affordable housing and facilitating multigenerational living, among other benefits. Their history and geographical spread are clear from the breadth of names used to describe them – casitas, granny flats, in-law units, secondary units, carriage houses, backyard cottages, alley flats, and others. But ADUs largely dropped off the policymaking and media radar around World War II as cities suburbanized and used their Supreme Court-sanctioned zoning powers to protect single-family neighborhoods, including by banning ADUs (Antoninetti, 2008; Liebig, Koenig, & Pynoos, 2006). ADUs began to re-emerge in the 1980s as a housing solution – “granny flats” – for older adults, but they largely failed to catch on (Antoninetti, 2008). By 2012, only an estimated 330 local governments nationwide allowed ADUs (Pfeiffer, 2015). But that is rapidly changing.

ADUs have become a hot topic in the U.S. over the last decade, as planners, policymakers, and advocates seek solutions to housing shortages, rising housing costs, homelessness, and numerous other societal and environmental problems (Casey, 2020; Geffner,

2018; Sanchez-Moyano & Galante, 2016). This renewed attention from practitioners has also spawned a surge in ADU-related research (Anacker & Niedt, 2019). But there is a “broad need for more research on ADUs” (Anacker & Niedt, 2019, p. 19). In particular, more research is needed on homeowners who do not yet have an ADU – their willingness and ability to build an ADU will determine the ceiling for ADU construction.

California is a prime location to study homeowners’ openness to creating ADUs for two reasons. First, the state is mired in a major housing supply and affordability crisis. It ranked 49th in the United States in housing units per capita in 2018 (U.S. Census Bureau, 2018b). It needs 1.3 million more affordable rental units to meet demand, according to one estimate (California Housing Partnership, 2020). And Governor Newsom has a goal of adding 3.5 million housing units total by 2025 (Dillon, 2019b; Woetzel et al., 2016). Second, California has significantly liberalized ADU regulations across the state over the last five years, preempting more restrictive local ordinances and making it the most permissive state for building ADUs.

In this study, I use a survey of single-family detached homeowners in the Sacramento metropolitan area ($n = 502$) to investigate (1) how many homeowners without ADUs would be open to creating an ADU; (2) what distinguishes homeowners willing to consider building an ADU from those who are not; and (3) the motivations and barriers homeowners see to adding an ADU. In the rest of this article, I provide a primer on ADUs – including their history, ADU regulatory trends and barriers, California’s regulatory relaxations, characteristics of ADU owners, and what we know about homeowners without ADUs; describe the three-pronged, mixed-methods approach I use to answer my research questions; and present the findings and implications of each analysis.

I find that there is substantial homeowner interest in creating an ADU. I estimate that between 40.4% and 54.1% of single-family detached homeowners in the City of Sacramento either own an ADU or would be open to building one. I find from my logistic regression that homeowners are more likely to be open to adding an ADU if they know someone who owns or has lived in an ADU, if they have property management experience, or if they more recently moved into their home. Concerns about noise and parking have the opposite effect. Surprisingly, so too does owning a garage. I find from my exploratory analysis that while most of respondents' rationales for not wanting an ADU are driven by personal preferences, a sizeable minority are logistical and potentially obviated by zoning reform and other measures to facilitate ADU construction. Among homeowners open to creating an ADU, housing family or friends in the future was the top-ranked motivation. Extra income was surprisingly ranked fifth. By contrast, cost-related concerns ranked as the biggest obstacles to creating an ADU, followed by permitting and regulatory issues.

My findings suggest that ADUs have significant potential to help California close its housing supply gap. California's relaxation of ADU regulations should reduce many of the barriers reported by homeowners, particularly if combined with educational programs and permit process streamlining. However, construction costs and obtaining financing will likely continue to be major impediments to widespread ADU production without changes in lending practices. Those financial barriers also highlight the inequalities of homeowner access to ADUs, and underscore a need for programs to provide ADU funding assistance to low-income households.

3.3 PRIMER ON ACCESSORY DWELLING UNITS

ADUs are small, self-contained dwellings that share the same lot as a larger primary dwelling, usually a single-family detached house. In addition to having independent sleeping quarters, they typically have separate entrances, cooking facilities, and bathrooms (J. Brown & Watkins, 2012; City of Sacramento, 2020). They are frequently between 600 and 1,000 square feet, but can be larger or smaller (Chapple et al., 2020). ADUs can be standalone structures in the backyard – or even the front yard – of the primary dwelling (detached ADUs). They can also be attached to the primary dwelling (attached ADUs). Or they can be converted from a portion of the larger dwelling itself, e.g. as part of the basement (internal ADU) (A. Brown, Mukhija, Shoup, Fischel, & Rules, 2017; Chapple, Wegmann, Nemirow, & Dentel-Post, 2012; Thigpen & Volker, 2017; Wegmann & Chapple, 2014). Figure 3.1 shows a detached ADU in backyard of a Sacramento home. The owner knocked down his backyard fencing and faced the ADU away from the back of his home so that it could have a separate street entrance (left panel). The right panel shows the back of the ADU as viewed from the back of the primary home.

FIGURE 3.1 – Detached Backyard ADU in Sacramento



Photo credits: Dov Kadin

ADUs are touted as a relatively cheap and quick way to increase housing supply, particularly in areas like California with major housing supply shortages (Casey, 2020; Woetzel et al., 2016). ADUs generally cost less to build than new single-family houses or comparably sized apartments in a multifamily building because they avoid land costs and usually take less time to permit and construct (and thus have lower carrying costs) (Chapple, Wegmann, Mashhood, & Coleman, 2017; Garcia, 2017). ADUs can also more easily avoid “not in my back yard” (NIMBY) opposition because they are less aesthetically intrusive and increase density more incrementally (Anacker & Niedt, 2019; Chapman & Howe, 2001). ADUs have so much potential that some researchers have even estimated that ADU-like developments could provide half of California’s new housing capacity in the coming decades, for example (Chapple et al., 2017; Woetzel et al., 2016).

The rental housing ADUs provide also tends to be relatively affordable. Chapple et al. (2017, p. 18), for example, surveyed ADU owners in the Pacific Northwest and found that 58% reported renting their ADUs below the market rate, “whether rented at arm’s length or not” (i.e. rented on the open market or instead to friends or family). Brown et al. (2017) found that ADUs in Los Angeles County rent for 89% of the monthly price for similarly sized “standard” apartments in the same neighborhood, using Craigslist ADU listings and Zillow cost estimates. And Chapple et al. (2012) found that ADUs listed on Craigslist around Oakland, Berkeley, and El Cerrito (California) were affordable to households making 62% of area median income (AMI), versus 68% for non-ADU rental units.

But market-rate ADUs are not likely to be affordable to rent for households with extremely low incomes, e.g. those with incomes under 30% of AMI (Chapple et al., 2012; Spevak, 2019). For example, Rudel (1984, p. 177) found that ADUs “do provide the least

expensive housing available in Babylon” – a small suburban town on Long Island (New York) – but they were not cheap enough to be an “economic substitute” for public housing. That said, ADUs are more likely than standard apartments to be rented at no or sub-market cost to the owner’s family members or friends (M. J. Brown & Palmeri, 2014; Chapple et al., 2017; Garcia, 2017; Gebhardt, Gilden, & Kidron, 2018).

Beyond providing affordable rental housing, ADUs also make housing more affordable – and homeownership more feasible – for homeowners who rent their ADUs (M. J. Brown & Palmeri, 2014; Howe, 1990; Wegmann, Schafran, & Pfeiffer, 2017). The rental income they earn can more than offset the costs of maintenance and debt service. Brown et al. (2017), for example, estimate that homeowners in Los Angeles County could net \$600-\$800 per month from renting out a converted 400-square foot garage.

ADUs can also provide other societal and environmental benefits. Environmentally, ADUs require both less material to build and less energy to maintain, at least as compared to single-family houses (Baigent, 2019; M. J. Brown & Palmeri, 2014; Moradibistouni, 2020). To the extent ADUs are located in areas with decent accessibility to jobs and other amenities, they could also reduce driving and vehicle miles traveled (Chapple et al., 2012; Geffner, 2018).

Societally, the American Association of Retired Persons (AARP) and others have long promoted ADUs as a way for older adults to downsize and “age in place,” supplement their income in retirement, house caregivers, or house and be closer to family members (Antoninetti, 2008; Geffner, 2018; Hare, 1991; Liebig et al., 2006; Spevak, 2019). More recently, several local governments including Los Angeles County have tested pilot programs to house homeless people in ADUs (Diaz, 2019). Some planners and scholars have also touted ADUs as fostering income, age, and racial diversity, both within neighborhoods and on the same plot of land (Anacker &

Niedt, 2019; A. Brown et al., 2017; Chapman & Howe, 2001; Micklow & Warner, 2014). In addition, ADUs can provide lower-income households access to single-family neighborhoods with better amenities, like better-funded public schools, that they might not be able to afford to buy into (Been & Infranca, 2014).

Despite their numerous potential societal and environmental benefits, ADUs are often difficult to permit if they are not outright prohibited.

3.3.1 ADU Regulations, Barriers, and Trends

ADUs have a long history in the United States. In urban areas, ADUs date back to the mid-1800's in Eastern Seaboard cities like Philadelphia and Washington, D.C. (Antoninetti, 2008). There, in the mold of London mews (alley) houses, carriage houses were built along service alleys behind estates to serve as horse stables on the ground floor and living quarters for the house staff upstairs. As the housing stock turned over, the carriage houses became housing for immigrants and lower-income urban workers (Antoninetti, 2008). ADUs also began to spring up elsewhere and in other forms, like internal ADUs to better accommodate multigenerational families and two-family homes in the early streetcar suburbs (Antoninetti, 2008; Mukhija, Cuff, & Serrano, 2014). But ADUs were never regularized when local governments began adopting zoning ordinances in the early 1900s. Instead, they were effectively excluded from single-family zones (Liebig et al., 2006; Mukhija et al., 2014). And by the 1940s ADUs were largely banned across the United States (B. B. Brown & Cropper, 2001).

In many places, like Chicago and New York City, ADUs have remained illegal (Been & Infranca, 2014; Hare, 1991; Infranca, 2014; Koziarz, 2020; Pfeiffer, 2015; Plitt, 2020; Talen & Knaap, 2003). But many other jurisdictions now allow ADUs (Been & Infranca, 2014; Chapple

et al., 2020; Infranca, 2014; Pfeiffer, 2015, 2019). Still, even where ADUs are nominally allowed, zoning restrictions and permitting requirements can make it infeasible for most homeowners to create legally permitted ADUs (Been & Infranca, 2014; Geffner, 2018; Infranca, 2014; Liebig et al., 2006; Mukhija et al., 2014; Pfeiffer, 2015; Ramsey-Musolf, 2018; Wegmann & Nemirow, 2011; Wegmann, Nemirow, & Chapple, 2012). Common types of local government restrictions on ADUs include:

1. *Space and size restrictions*, such as maximum floor-area ratios, lot coverage maximums, minimum setbacks, lot size minimums, and ADU size maximums (Anacker & Niedt, 2019; Chapple et al., 2020; Cho, 2016; Durning, 2013; Morales, 2019; Nick-Kearney, 2019; Pfeiffer, 2019; Wegmann et al., 2012);
2. *Occupancy restrictions*, like requiring the owner of the plot to live in the primary dwelling, or requiring the ADU occupants to be related to the owner (Anacker & Niedt, 2019; Chapple et al., 2020; Cho, 2016; Durning, 2013; Nick-Kearney, 2019); and
3. *Parking requirements*, such as requiring provision of additional off-street parking for the ADU or requiring replacement of off-street parking that was replaced to create the ADU (Anacker & Niedt, 2019; A. Brown et al., 2017; Chapple et al., 2020; Cho, 2016; Durning, 2013; Morales, 2019; Pfeiffer, 2019; Shoup, 2011; Wegmann et al., 2012).

And even where those requirements are met, local governments sometimes require design review or discretionary review, which can be time consuming and expensive and provide neighbors a forum to oppose the proposed ADU (Been & Infranca, 2014; Cho, 2016). In addition, ADU permitting and impact fees can be prohibitive (Chapple et al., 2017; Garcia, 2017). A recent survey of planning staff in 252 California cities and counties revealed that jurisdictions charged as much as \$50,000 in impact fees per ADU (Pfeiffer, 2019; Raetz, Garcia, & Decker, 2019).

It can also be difficult for homeowners to obtain financing to create an ADU. Many lenders have refused to finance loans to build ADUs unless they are based on the homeowners' equity in the primary house, due largely to the conservative and inconsistent guidelines on ADUs from the major mortgage aggregators (e.g. Fannie Mae and Freddie Mac) and insurers (e.g. the U.S. Department of Housing and Urban Development) (Been & Infranca, 2014; A. Brown et al., 2017; B. B. Brown & Cropper, 2001; J. Brown & Watkins, 2012; Chapple et al., 2017; Geffner, 2018; Wegmann, 2015a). They have also generally refused to consider rental income from ADUs in mortgage calculations for houses that already have ADUs, though that is beginning to change (A. Brown et al., 2017; California Housing Finance Agency, 2017; Fannie Mae, 2019; Wegmann, 2015a).

These barriers do not mean that ADUs are not being permitted and built; they are – particularly in California, Oregon, and Washington – just not in large numbers in most places (M. J. Brown & Palmeri, 2014; Chapman & Howe, 2001; Chapple et al., 2020, 2017; Gebhardt et al., 2018). The unmet demand for ADUs has instead been partially filled through the production of unpermitted ADUs and other “informal” housing (Mukhija et al., 2014). Gellen (1985), for example, reported that between 60,000 and 300,000 illegal ADUs are built each year in the United States. And Wegmann and Mawhorter (2017) estimated that between 1990 and 2010 the average California city added nearly 33% as many informal units as permitted units annually. But this informal housing does not sate the demand for permitted ADUs. It also has substantial side effects, including health and safety risks for the tenants, tenure insecurity, environmental degradation, and strain on public infrastructure (Wegmann, 2015a; Wegmann & Mawhorter, 2017).

3.3.2 California Liberalizes ADU Regulations

California enacted its Second Unit Law in 1982 to spur ADU production and help fill the “tremendous unmet need for new housing to shelter California’s population” (California Senate Bill 1534, 1981-1982, Section 1[a]; Government Code Section 65852.2). The Second Unit Law required that cities and counties either adopt an ordinance permitting ADUs or grant a special or conditional use permit for ADUs meeting state-specific standards (California Senate Bill 1534, 1981-1982). The legislature amended the law in 2002 to require that ADUs be permitted ministerially (“by right”), i.e. without the discretionary review and hearings allowed with special and conditional use permits (California Assembly Bill 1866, 2001-2002, Section 2). But even then, the law allowed local governments so much leeway in how they permitted ADUs that they could effectively prohibit ADUs in most instances through the types of restrictions discussed above (Casey, 2019c; Nemirow & Chapple, 2012; Ramsey-Musolf, 2018). And that is largely what happened.

ADU permitting remained stagnant across most of the state until the legislature amended the Second Unit Law in 2016 and 2017 to more effectively liberalize ADU regulation (Garcia, 2017; Ramsey-Musolf, 2018). Among other changes, those amendments (1) reduced – and for some types of projects, eliminated – parking requirements for ADUs, (2) reduced utility connection fees and capacity charges for ADUs, (3) provided streamlined permitting for most internal ADUs, and (4) authorized local governments to permit “junior” ADUs (JADUs), which are internal ADUs not exceeding 500 feet that are allowed to have “efficiency” cooking facilities and may share bathroom facilities with the primary house (California Senate Bill 1069, 2015-2016; California Assembly Bill 2299, 2015-2016; California Assembly Bill 2406, 2015-2016; California Department of Housing and Community Development, 2018; California Department

of Housing and Community Development, 2018). These streamlining measures coincided with a marked increase in ADU applications in some of the state’s major cities, like Los Angeles, San Francisco, San Jose, and Oakland (Garcia, 2017; Ramsey-Musolf, 2018). But permit applications did not increase nearly as much (or at all) in many other jurisdictions, including Sacramento (Garcia, 2017; Hertel, 2020).

In 2019, the state legislature took its biggest step yet toward liberalizing ADU regulations. Among other regulatory relaxations, the amended Second Unit Law (Government Code Section 65852.2) and related statutory provisions:

1. Prohibit local governments from setting minimum lot size requirements for ADUs;
2. Cap setbacks at four feet;
3. Prohibit ADU size maximums below 850 square feet (or 1,000 square feet for ADUs with more than one bedroom);
4. Prohibit lot coverage, floor area ratio, or open space requirements that would prevent construction of an 800-square-foot ADU;
5. Prohibit owner-occupancy requirements until 2025;
6. Prohibit local governments from requiring the replacement of covered off-street parking spaces that were converted into an ADU;
7. Prohibit local agencies from imposing impact fees on ADUs less than 750 square feet, and for larger ADUs requires that fees be proportional to the ADU’s relationship to the primary house;
8. Require local governments to ministerially approve or deny all ADU applications within 60 days;

9. Remove covenants, conditions, and restrictions that prohibit or unreasonably restrict ADU or JADU construction (Civil Code Section 4751); and
10. Provide an amnesty-type program for owners of unpermitted ADUs, allowing them to delay compliance with building standards that are not necessary to protect health and safety (Health and Safety Code Section 17980.12).

And perhaps most importantly, the Second Unit Law now requires local governments to ministerially permit all of the following, notwithstanding otherwise applicable zoning requirements:

1. One internal ADU or JADU in a single-family home as long as it has a separate entrance and has sufficient setbacks for fire and safety;
2. One detached ADU up to 800 square feet on a lot with a proposed or existing single-family home, so long as it is not taller than 16 feet and maintains four-foot rear and side yard setbacks;
3. One detached ADU and one JADU complying with the same requirements;
4. Internal ADUs within the portions of existing multifamily dwellings that are not used as livable space, as long as they meet state building standards;
5. Internal ADUs within up to 25% of the units in a multifamily building; and
6. Up to two detached ADUs on the same as a multifamily building, so long as they are not taller than 16 feet and maintain four-foot rear and side yard setbacks.

This effectively ends single-family zoning across the state. And it could not have come at a more opportune time.

The unmet housing need that originally inspired the California Legislature to act in 1982 has, if anything, gotten worse (California Housing Partnership, 2020; Fulton, 2020; Stephens,

2020; Woetzel et al., 2016). And California's housing supply gap – particularly the need for affordable housing – is likely to increase if the COVID-19 pandemic creates an economic recession (Stephens, 2020). The number of new housing starts in California has dropped precipitously following past recessions, in large part because housing prices plummet concurrently (Fulton, 2020). Because impact fees and other entitlement and carrying costs are so high in California, it is harder for developers to make multifamily and even single-family housing projects pencil out when housing prices drop (Raetz et al., 2019). The pandemic could cause single-family home starts to decrease between one-third and 50%, according to one rough estimate (Stephens, 2020).

ADUs, on the other hand, are generally cheaper to produce (Chapple et al., 2017; Garcia, 2017). And California's liberalization of ADU regulations makes them even cheaper. ADUs could thus help fill the increasing housing supply gap, even during a post-COVID-19 recession (Casey, 2020).

But what is the ceiling for further ADU construction? Reducing the regulatory barriers to building ADUs does not guarantee a surge of ADU construction to the levels envisioned by Woetzel et al. (2016) or otherwise. It will take educational campaigns, increased media attention, and time for homeowners to acclimate to the new regulatory zeitgeist (Chapple et al., 2017). But even fully informed homeowners will not all want to build ADUs. And many of those that do will still face motivations and barriers unrelated to regulatory strictures (Chapple et al., 2017).

Better understanding these barriers and motivations, and what distinguishes homeowners open to creating ADUs from those who are not, can help planners, policymakers, civil society organizations, and the private sector alike identify additional opportunities to foster ADU

construction beyond relaxing zoning and permitting regulations. Previous studies of ADU owners are a good starting point.

3.3.3 Who Owns ADUs?

Despite ADUs' increasing prominence, there is still much we do not know about them and their owners (Mukhija et al., 2014). They are simply difficult to survey. Not only are ADUs often physically hidden within existing structures (e.g. garages and basements), they are frequently hidden in a legal sense, too – unpermitted because the local zoning prohibits them or because permitting is prohibitively expensive (City of Sausalito Community Development Department, 2011). Scholars are increasingly studying the informal housing market in the United States (and the rest of the Global North), including unpermitted ADUs (Alterman & Calor, 2020; Gellen, 1985; Wegmann, 2015b, 2015a; Wegmann & Mawhorter, 2017). But most of what we know comes from studies of permitted ADUs, largely in Cascadia – primarily Portland, Oregon; Seattle, Washington; and Vancouver, British Columbia – and California.

3.3.3.1 *Demographics of ADU Owners*

Some of the earliest research on ADU owners came from the East Coast. For example, Rudel (1984) surveyed 66 ADU owners (and 92 other single-family homeowners) in Babylon, a small New York suburb. He found that the average age of the “household head” was effectively the same for ADU owners (50.6) and other homeowners (50.0). But he found that ADU owners were disproportionately white. And his discriminant analysis showed that smaller and lower-income households were more likely to own a single-family home with an ADU.

Chapman and Howe (2001) summarize a few additional unpublished or otherwise “relatively inaccessible” studies of ADU owners from 1980s, including two from the East Coast (Connecticut and New York). But both studies focused on cities with age restrictions on either the ADU owners or occupants, so they are demographically skewed (Chapman & Howe, 2001).

Most recent studies I found focus on ADU owners in Cascadia and California. For example, Chapman and Howe (2001) surveyed 45 homeowners in Seattle, Washington who had built a permitted ADU between 1994 (when ADUs were legalized there) and 1998. Respondents had a higher median income than Seattle households as a whole, though it appears the Seattle-wide number also included renter households, who tend to have lower incomes. Respondents had relatively small families, with an average household size of 2.16 people. And respondents’ average age was 50, with only 14% of owners older than 65. However, the authors concluded that the average age would likely increase over time, since all the ADUs in the survey had been newly added.

Maaoui (2018) took a different approach to studying permitted ADUs in Washington. She modeled the demographic correlates of ADU location for the 54 ADU permits issued in King County, Washington between 2010 and 2014. She found that the share of black households, the share of Hispanic households, and the share of middle-income households in a given ZIP code were all correlated with an increased rate of ADU permitting.

Elsewhere in Cascadia, Brown and Palmeri (2014) reported on results from a 2013 survey of over 200 owners of permitted ADUs in Portland. They found that ADU owners (median age = 53) and the general population of Portland homeowners (median age range = 45-54) had relatively similar age distributions, though the former had a higher share of middle-aged adults and a lower share of older adults (75+). Gebhart et al. (2018) similarly found a median ADU

owner age range of 45-54 from a 2017 survey of 236 permitted ADU owners in Portland. But their findings did reveal at least four demographic differences between the ADU owner sample and full Portland homeowner population. First, and most starkly, 88% of respondents had at least a bachelor's degree, compared to 60.1% across all Portland homeowners population according to 2017 Census data (Gebhardt et al., 2018; U.S. Census Bureau, 2017a). Second, the ADU owner respondents had a higher median income (Gebhardt et al., 2018; U.S. Census Bureau, 2017a). Third, only 80% of respondents were white, compared to 85.6% across all Portland homeowners (Gebhardt et al., 2018; U.S. Census Bureau, 2017a). And fourth, 59% of respondents had owned the primary house (on the lot with the ADU) for 10 years or less, compared to closer to 51% across the Portland homeowners population (Gebhardt et al., 2018; U.S. Census Bureau, 2017a).

In California, Wegmann and Chapple (2012, 2014) surveyed a close-to-random sample of 508 homeowners living on single-family lots near Bay Area Rapid Transit stations in Oakland, Berkeley, and El Cerrito. The authors found no major demographic differences between respondents who owned ADUs (n = 81; 16%) and those who did not (n = 427), though ADU owners had slightly lower incomes, had somewhat smaller household sizes, were somewhat less likely to be white, and were slightly more likely to have graduated college.

While the demographics vary from place to place and study to study, some trends appear. ADU owners appear to be similar in average and median age to the general homeowners population, but potentially with a higher share of middle-aged adults and a lower share of older adults. They also appear to have smaller households, have higher levels of education, and be more racially diverse (with the exception of Babylon, New York in 1982). And one study indicates that ADU owners might also be more likely to have recently moved into their primary

house (Gebhart et al., 2018). But the studies do not reveal a clear correlation between income and ADU ownership. And most of the studies do not attempt to test the relative effect of demographic characteristics on ADU ownership.

3.3.3.2 *Motivations and Barriers Experienced by ADU Owners*

Even fewer studies have investigated the motivations and barriers faced by homeowners in building their ADUs. I could only locate four such studies, all of which focus on ADU owners in Cascadia.

The most common motivations reported by the Seattle homeowners in Chapman and Howe's (2001) survey were providing extra income (cited by 64%), making mortgage payments more affordable (53%), and increasing the value of their home (47%). The authors did not discuss the biggest obstacles encountered by homeowners in creating their ADUs. But they did note that homeowners experienced "negligible" neighbor opposition to building their ADUs; they actually reported neighbor support more frequently than opposition.

Brown and Palmeri (2014) report that the motivation most frequently cited by Portland ADU owners was financial – 46% reported income from ADU rent as their biggest motivation. The next most cited motivation was providing living space for a family member or helper (26%). Financial concerns also presented major obstacles – 56% listed either "paying for construction" (~32%), "permitting fees" (~25%), and/or "obtaining financing" (~5%) as one of their two biggest challenges. The second-most common barrier was "design constraints or challenges" (36%) with typical issues including meeting setback requirements and making the ADU exterior match the primary dwelling. When Gebhart et al. (2018) surveyed a potentially overlapping sample of 200-plus Portland ADU four years later, regulatory or design-related impediments

(26%; categories including “lot setbacks or height” and “design constraints or challenges”) and the permitting process (25%) were the two “biggest challenges” most frequently cited.

Chapple et al. (2017) surveyed 414 owners of permitted ADUs in Portland, Seattle, and Vancouver, British Columbia. The two most frequently listed reasons respondents decided to build an ADU were extra income (38%) and creating living space for a family member or helper (28%). Respondents reported obtaining a loan (34%) and paying the construction costs (18%) as their two biggest challenges.

In sum, homeowners’ primary motivations for creating an ADU show remarkable consistency across the three studies that report on it, with extra income being the uniformly most common rationale. Financial concerns were also commonly listed barriers to building an ADU, but there was more variability, both as to type of financial concern (e.g. cost of construction versus obtaining financing) and primacy of other obstacles in some cases (e.g. design constraints and challenges).

However, Chapple et al. (2017) caution that their findings likely underreport the extent of barriers faced by homeowners because the survey only included ADU owners, not homeowners who have tried but failed to permit or construct an ADU. A similar caveat applies to the motivations reported by ADU owners – they might not capture the range or primacy of motivations faced by homeowners who have not yet created an ADU. So, what about those homeowners?

3.3.4 What about Homeowners Who Do Not Have ADUs?

Better understanding how homeowners who do not have ADUs view ADUs would help identify additional opportunities to foster ADU construction beyond relaxing zoning and permitting regulations. As Brown and Palmeri (2014, p. 43) note:

For those who want to encourage ADUs, a more concerted effort could be made to identify barriers to development. In particular, it would be useful to locate homeowners who wanted to create ADUs, but did not succeed or follow through, and to compare their experience with those who did succeed.

Yet evidence is sparse.

Rudel (1984) surveyed 92 single-family homeowners in Babylon who did not already have an ADU on the same lot. Over 40% of respondents reported that they were “considering” building an ADU. Rudel’s discriminant analysis showed that households with fewer children and middle-aged household heads (aged 51 to 67) were more likely to consider creating an ADU. While income did not have a significant effect on openness to building an ADU, most respondents listed the economic return from renting an ADU as the primary motivation to create one.

The City of Sausalito (2011), a small suburban city in California just east of San Francisco, surveyed homeowners in the city’s two-family and multifamily zones in 2010 (only 50% of the respondents were single-family detached homeowners). Of the 300-plus respondents who did not already own an ADU, 22% reported having considered adding an ADU, and 21% answered that they would be “inclined to create one” if the city changed its zoning ordinance to permit them. Among those who had considered creating an ADU, the most frequently cited motivation was extra income (49%) followed by providing a living space for a relative (21%).

In Wegmann and Chapple’s 2011 survey in the Bay Area, 31% of single-family homeowners who did not already own an ADU indicated they had either already attempted to

build an ADU, were actively planning to build one, or would consider doing so in the future (Wegmann & Chapple, 2012). Of those respondents who had tried and failed to build an ADU, an inability to fit the required parking on their lots was the most frequently listed reason for failing.

A number of studies have also specifically assessed the openness of older adults to creating an ADU, due to the many potential benefits of ADUs for the elderly. For example, Varady (1988, 1990) surveyed 171 “elderly and pre-elderly” homeowners (59 to 85 years old) from the same church congregation in Baltimore, Maryland. Nine percent of respondents reported interest in creating an internal ADU (excludes detached and attached ADUs). But the author cautioned that respondents might have been naïve about the process of creating an ADU, and thus overly optimistic about their interest (Varady, 1988). In terms of respondents’ rationales for creating an ADU, the author’s multiple discriminant analyses highlighted need – e.g. high medical costs and poor health – as a major motivation (Varady, 1988, 1990b). By contrast, providing a “home to a loved one in need of care” and providing “housing for relatives or friends” were the two most cited motivations for people age 50-plus who were willing to consider creating an ADU, according to the 2018 AARP Home and Community Preferences Survey (Spevak, 2019). The results from surveys of older adults are not representative of the entire homeownership population, but they do highlight the breadth of motivations for considering building an ADU.

In sum, the available evidence indicates that there is a potentially large demand for ADUs amongst homeowners who do not yet have one – 31% and 40% of homeowners were willing to consider creating an ADU, according to the two non-age-restricted studies of single-family homeowners (Wegmann & Chapple, 2012; Rudel, 1984). There is also some evidence that extra

income and housing family members or friends are two of the primary motivations for homeowner interest in creating an ADU (Rudel, 1984; City of Sausalito Community Development Department, 2011; Spevak, 2019). But the evidence is limited to just a few studies, only two of which focused on the full spectrum of homeowners (not just older adults) in single-family homes (generally the only type of lots where ADUs are allowed). And none of the studies explored the motivations and barriers facing homeowners in detail. My study helps fill these gaps.

3.4 ASSESSING OPENNESS TO BUILDING AN ADU

I use a survey of single-family detached homeowners in the Sacramento metropolitan area (primarily those in the City of Sacramento itself) to answer my three main research questions:

1. How many single-family detached homeowners without ADUs would be open to building an ADU?
2. What distinguishes homeowners willing to consider building an ADU from those who are not?
3. What motivations, disbenefits, and barriers do homeowners see to adding an ADU?

To gauge homeowners' willingness to consider building an ADU, my survey asked respondents without an ADU whether they were in the process of building one, had attempted to build one in the past, or had or would ever consider adding one. I then estimated a binomial logistic regression model to ascertain what surveyed characteristics most strongly correlate with openness to building an ADU. Finally, I used a series of open-ended survey questions to explore in more depth the motivations, disbenefits, and barriers that homeowners see to adding an ADU.

3.4.1 Study Setting

California is a prime location to study ADUs. As discussed in the introduction, the state is mired in a major housing supply and affordability crisis that ADUs could help ameliorate. In addition, California has significantly liberalized ADU regulations across the state over the last five years, making it more feasible than ever to build ADUs at scale.

Within California, the City of Sacramento – as well as the Sacramento metropolitan area generally – is an ideal location to study homeowners’ openness to creating ADUs. For one, it has great physical potential for ADU construction. Most of the city is zoned for single-family detached housing, and 60.4% of Sacramento’s housing units are single-family detached houses (U.S. Census Bureau, 2018b). That is substantially higher than for most of the remaining top-ten most populous cities in California, including Los Angeles (38.2%), San Diego (44.9%), San Jose (53.0%), San Francisco (19.9%), Long Beach (39.9%), Oakland (42.4%), and Anaheim (41.7%) (U.S. Census Bureau, 2018b). Only Bakersfield has an appreciably greater percentage of single-family detached homes, with 71.4% (U.S. Census Bureau, 2018b). In total, Sacramento has over 118,000 single-family detached homes (U.S. Census Bureau, 2018b).

In addition to ample substrate for ADU construction, Sacramento also had some of the least restrictive ADU permitting regulations in the state at the time of my survey, theoretically making it easier for homeowners to build permitted ADUs. Table 3.1 outlines some key features of Sacramento’s ADU (or “secondary dwelling unit”) regulations as of March 2019. Sacramento since amended its ADU regulations in December 2019 to comply with the state’s 2019 amendments to the Second Unit Law (City of Sacramento, 2020; Hertel, 2020).

TABLE 3.1 – Key Features of Sacramento’s ADU Regulations

<i>Type of review required_a</i>	Ministerial. Site and/or design plan review only required in historic districts and where ADUs do not meet developments standards.
<i>Zones in which ADUs are allowed_a</i>	ADUs allowed on lots where a single-family detached unit exists or is being built.
<i>Minimum lot size_{a,b}</i>	None
<i>Maximum ADU size_{a,b}</i>	1,200 sq. feet for detached ADUs. Potentially greater square footage allowed for ADUs built within the single-family home or an existing legally constructed accessory structure.
<i>Rear- and side-yard setbacks_a</i>	None required for the ground floor of most detached ADUs (unless they are less than 60 feet from the front property line).
<i>Parking requirements_{a,b,c}</i>	No standard
<i>Typical impact fees per ADU_b</i>	\$291

Notes:

a. Source: Sacramento City Planning and Development Code Section 17.228.105

b. Source: Pfeiffer (2019)

c. Source: Sacramento City Planning and Development Code Section 17.608.030

Overall, at the time I administered the survey, Sacramento’s regulations were friendlier to ADU development than those of the average California jurisdiction. According to Pfeiffer’s (2019) ADU Regulation Index based on minimum lot size, maximum ADU size, off-street parking requirements, and development fees, Sacramento had the seventh least restrictive ADU practices in the state (out of the 220 cities and counties whose data was used to calculate the index).

Chapple et al. (2020) used an expanded set of criteria to grade 204 California jurisdictions’ ADU ordinances for development friendliness. They gave Sacramento a B-, a better grade than the statewide average and median (both C+). ADU permitting in Sacramento and across the state should get even easier and cheaper as local governments implement the 2019 statutes that relax ADU regulations statewide.

On the demand side, Sacramento also has a potentially large latent demand for ADUs. For one, it has a burgeoning and relatively young population that ADUs could help house. Sacramento added more people between 2018 and 2019 than all but one (Chico) of California’s

482 cities (California Department of Finance, 2019). And it grew at a faster rate (1.49%) than any of the other top-10 most populous cities in the state (California Department of Finance, 2019). Sacramento also has a greater proportion of young adults (38.5% are between 20 and 44 years old) than the state as a whole (35.5%) (U.S. Census Bureau, 2018b); studies suggest that most ADU renters are in that same age range (Gebhart et al., 2014; Chapman & Howe, 2001; Rudel, 1984).

In addition, Sacramento has a tightening housing market that ADUs could help loosen. Accompanying its large and rapid population increases, Sacramento's rents have also increased steadily over the last few years, while its rental vacancy rate has dropped (Corso, 2019; U.S. Census Bureau, 2010, 2018b). Sacramento's vacancy rate dipped from 6.6% in 2010 to 4.2% in 2018 (U.S. Census Bureau, 2010, 2018b).

These conditions that would seemingly foster both ADU construction and rental demand. But the number of ADU permit applications in Sacramento remain relatively low compared to the jump in applications seen in other large cities following California's relaxation of ADU restrictions starting in 2016. Sacramento received 83 ADU permit applications in 2019 (Hertel, 2020), up 388% from 17 in 2015 (Garcia, 2017). By contrast, the other top-10 most populous California cities for which I had permitting data all saw ADU application rates jump over 300% by 2017. Los Angeles, Long Beach, Oakland, San Diego, San Francisco, and San Jose all received at least 300% more ADU permits in 2017 than 2015 (Garcia, 2017). Those six cities also saw a greater numerical increase than Sacramento over the same time period. Los Angeles topped the charts with an increase of at least 1,890 ADU permit applications between 2015 and 2017 (Bertolet & Gabobe, 2019; Garcia, 2017).

Sacramento is thus ripe for an investigation into homeowners' willingness to build an ADU and the motivations and barriers they expect to face in attempting to build one. Yet most research on ADU ownership has focused on Cascadia and the San Francisco Bay Area (M. J. Brown & Palmeri, 2014; Chapman & Howe, 2001; Chapple et al., 2017; City of Sausalito Community Development Department, 2011; Gebhardt et al., 2018; Maaoui, 2018; Wegmann & Chapple, 2012, 2014). And most of that research explores the barriers, motivations, and ADU uses of homeowners who already own an ADU, rather than those who have not yet built one. This study helps fill those geographic and substantive gaps.

3.4.2 Sampling Plan

I started with two sample size goals. First, I wanted to sample enough homeowners in the City of Sacramento to make inferences about the willingness of the city's entire homeownership population to build an ADU. Second, I wanted to sample enough homeowners in the Sacramento metro area to estimate a logistic regression model with up to 15 predictor variables without overfitting the model.

I calculated my minimum sample size for Sacramento city homeowners using Equation 1:

$$n_{min} = p(1 - p) / \left(\frac{E}{Z^*}\right)^2 \quad (1)$$

I used 0.3 as my estimated proportion (p) of homeowners open to building an ADU, based on a 2011 survey of homeowners in the San Francisco Bay Area (Wegmann & Chapple, 2012). And I chose a 95% confidence interval ($Z^* = 1.96$) and sampling error of +/- 5% ($E = 0.05$). That yielded a minimum sample size of 323 Sacramento city homeowners.

I calculated my minimum sample size for the logit model using Equation 2, based on the conventional recommendation from Peduzzi et al. (1996):

$$n_{min} = 10k/p \quad (2)$$

I again used 0.3 as my estimated proportion of homeowners open to building an ADU. And I set the number predictor variables (k) at 15, based on my list of potentially relevant information to be gleaned from my surveys (including socioeconomic variables, physical housing characteristics, experience with construction and property management, familiarity with ADUs, and neighborhood preferences). That yielded a minimum sample size of 500 homeowners. I tried to recruit as many homeowners as possible from the City of Sacramento itself, but I had to expand to the broader Sacramento metro area to achieve my ideal sample size (or close thereto) for developing the logit model because of budget restrictions and available recruitment options, as discussed below.

I could not use simple random sampling to meet my sample size goals, due to budget constraints that prevented us from recruiting survey participants via postcards and letters in the mail. Instead, I recruited participants via email from three separate databases – two lists of respondents to previous surveys who indicated an interest in taking a future survey on ADUs, and a set of double-opt-in panels maintained by the experience management company Qualtrics.

I obtained the first recruitment list through the 2018-2019 Campus Travel Survey at the University of California, Davis, which was administered in October 2018 to a stratified random sample of university faculty, staff, and students, most of whom live in the Sacramento metro area. I asked all homeowners if I could contact them for a “future research study regarding accessory dwelling units and neighborhood preferences;” 143 respondents said yes.

I garnered the second recruitment list through two surveys regarding the JUMP bikeshare program in Sacramento, West Sacramento, and Davis, California. One survey was administered to recruits from a random sample of households from the three cities. The second was administered to intercepted JUMP bikeshare users in those cities. Each survey asked respondents whether they would be willing to take a future survey on “housing priorities and accessory dwelling units.” That yielded a 440-person recruitment list for my ADU survey.

After culling the recruitment lists from the Campus Travel Survey and JUMP bike surveys to remove any duplicate email addresses, I emailed all 583 potential recruits with an invitation and link to take my ADU survey. I emailed the invitations on August 14, 2019, then followed up with two reminder emails later that month to those who had not yet completed the survey. All respondents were entered into a raffle for two \$25 pre-paid Visa gift cards. Overall, 312 of the 583 recruits both passed the screening question (owning their own home) and at least partially completed the survey.

My final recruitment came from the double-opt-in panels maintained by Qualtrics. To maintain confidentiality, Qualtrics recruited and administered the survey to those respondents directly in late July and early August 2019. I had Qualtrics focus on homeowners in the City of Sacramento. But due to initial uncertainty about how many city residents they could recruit, I expanded the recruitment pool to include the cities of Davis and West Sacramento. The Qualtrics pool recruitment yielded 351 respondents who passed the screening question (owning their own home), finished the survey, and did not provide any unintelligible or clearly unresponsive answers to the text response questions (to weed out unserious respondents).

In total, I garnered 663 respondents across the three recruitment pools. I then excised the 106 respondents who either did not answer the primary questions of interest (whether they own

an ADU already or would be open to building one) or failed to answer at least five other questions. I further culled the remaining 557 complete cases by removing (1) all respondents who did not own a single-family detached home (the only type of lot on which ADUs were allowed at the time of the survey), and (2) all respondents who lived outside of the Sacramento metro area (defined as the Sacramento-Roseville combined statistical area, comprising Sacramento, Yolo, Sutter, Yuba, Nevada, Placer, and El Dorado counties). That yielded a final sample size of 502 single-family detached homeowners living in the Sacramento metro area.

3.4.3 Respondent Snapshot

Figure 3.2 shows the geographic distribution of the 502 respondents, including 396 in the City of Sacramento itself, 69 in Davis (Yolo County), 21 in West Sacramento (Yolo County), eight in Woodland (Yolo County), two in Elk Grove (Sacramento County), two in unincorporated Yolo County, and one each in Lincoln (Placer County), Marysville (Yuba County), Citrus Heights (Sacramento County), and unincorporated El Dorado County.

FIGURE 3.2 – Geographic Distribution of Survey Respondents

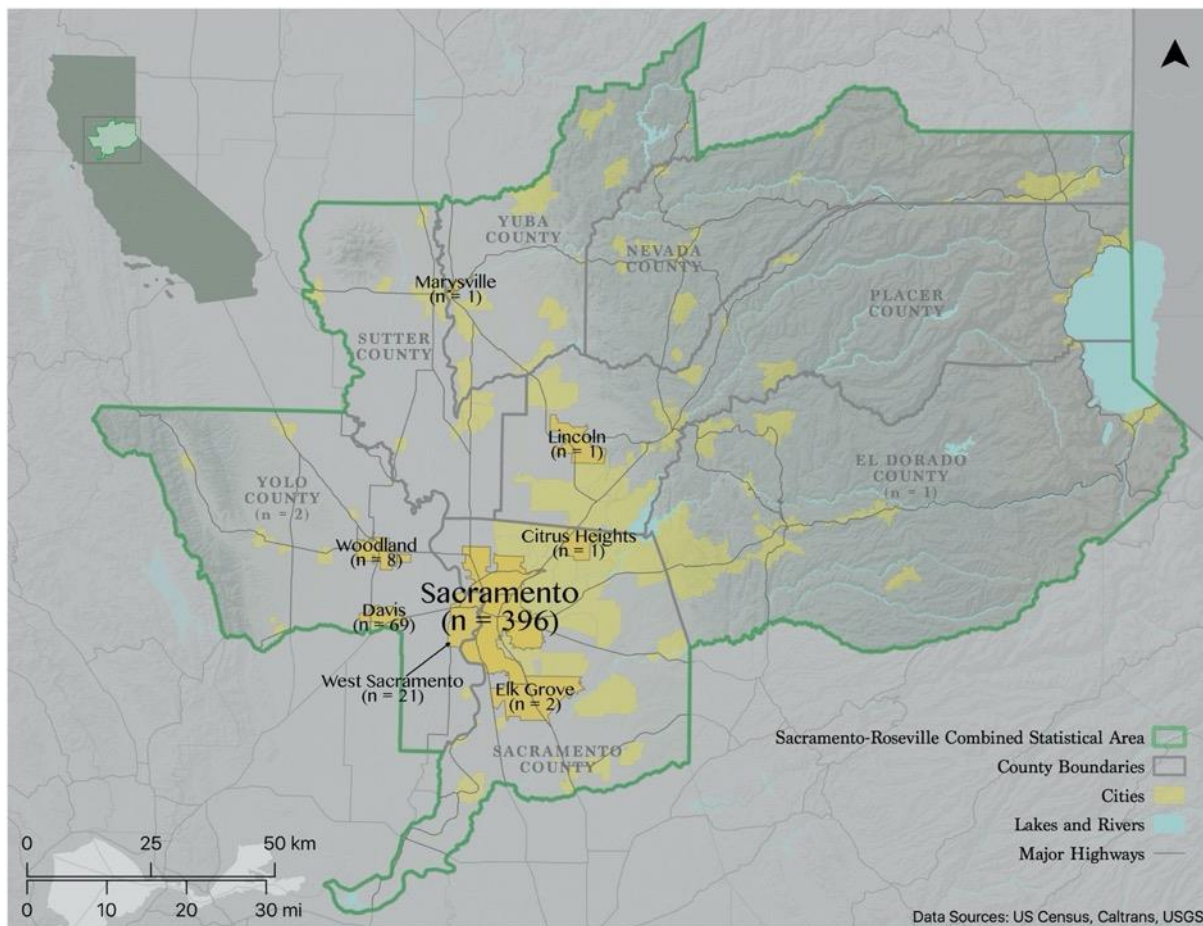


Table 3.2 summarizes the housing stock and demographic characteristics of both the full Sacramento metro area sample and the City of Sacramento subsample. It also compares the sample characteristics to those of the entire homeowner populations in both Sacramento and California (which primarily – though not wholly, like my study sample – comprise single-family detached homeowners). My Sacramento subsample and full Sacramento metro area sample are both younger, whiter, more educated, and have a greater percentage of people who have lived in the same home for less than 10 years than the homeowner populations of Sacramento and California.

TABLE 3.2 – Characteristics of Sampled Homeowners Compared to Homeowners in Sacramento and California

	City of Sacramento Sample Only	Full Sacramento- Area Sample	City of Sacramento Homeowners^a	California Homeowners^a
<i>Sample size</i>	396	502	-	-
Housing Stock^a				
<i>Number of owner-occupied housing units</i>	396	502	89,678 (+/- 4,030)	7,165,664 (+/- 30,156)
<i>Number of owner-occupied single-family detached units</i>	396	502	79,816 (+/- 3,770)	5,898,001 (+/- 26,467)
Demographics^a				
<i>Median age or age bracket</i>	46 (45-54)	48 (45-54)	55-64	55-64
<i>Median income or income bracket</i>	\$75,000 - \$99,999	\$100,000 - \$124,999	\$82,959 (+/- 1,525)	\$95,072 (+/- 244)
<i>Share with bachelor's degree or higher</i>	63.1%	68.5%	45.4% (+/- 1.0)	43.6% (+/- 0.1)
<i>Share non-Hispanic white</i>	60.4%	64.3%	48.9% (+/- 0.9)	55.9% (+/- 0.1)
<i>Share with 10 or fewer years in current home</i>	49.5%	49.2%	33.6% ^{bb}	29.2% ^{bb}
<i>Average household size</i>	2.87	2.87	2.76 (+/- 0.03)	3.01 (+/- 0.03)

Notes:

a. Housing stock estimates for the City and Sacramento obtained from table S2504 from the American Community Survey's 2018 1-year estimates (U.S. Census Bureau, 2018a). Demographic estimates obtained from tables S2502, S2503, and B25010 from the American Community Survey's 2018 5-year estimates (U.S. Census Bureau, 2018b). Demographic estimates are for all owner-occupied housing units, the majority of which are single-family detached units.

b. For the City of Sacramento and California, this equals the share of homeowners who have moved into their current home in 2010 or later (8 or fewer years before the 2018 American Community Survey).

The demographic differences between my City of Sacramento subsample and the full population of Sacramento homeowners might reflect actual differences between single-family detached homeowners and other homeowners (who are included in the Sacramento homeowner population data but not in my Sacramento subsample). But national data from the American Housing Survey show that single-family detached homeowners are nearly identical to the

population of all homeowners in average age, educational attainment, race, and years in the same home (U.S. Census Bureau, 2017b). More likely, the demographic differences result from a survey recruitment bias or non-response bias (Dillman, 2007).

The demographic differences could impair my ability to use the Sacramento subsample to make inferences about the city’s entire homeownership population if the differing characteristics correlate to my primary variable of interest – homeowners’ willingness to build an ADU. To test this, I split the Sacramento subsample into two groups – homeowners open to building an ADU and homeowners who do not want an ADU (categorization technique described in the following subsection). I then compared the two groups by average age, share of college graduates, share of non-Hispanic whites, and share with 10 or fewer years living in the same home. Table 3.3 shows statistically significant differences between the two groups in all characteristics except share of college graduates. I thus decided to weight my Sacramento subsample to more closely match the demographics of the city’s homeowner population and improve my ability to make population-level inferences from the Sacramento subsample.

TABLE 3.3 – Comparing the Characteristics of Sampled Sacramento Homeowners by Willingness to Consider Building an ADU

	Homeowners Open to Building an ADU	Homeowners Who Do Not Want an ADU	p-Value^a
<i>Sample size</i>	199	197	-
Demographics^a			
<i>Average age</i>	44	52	<0.001***
<i>Share with bachelor’s degree or higher</i>	65.8%	60.4%	0.311
<i>Share non-Hispanic white</i>	53.3%	67.5%	<0.01**
<i>Share with 10 or fewer years in current home</i>	62.8%	36.0%	<0.001***

Note:

a. ***p<0.001, **p<0.01, *p<0.05. Tests: 2-sided t-test for average age; 2-sided test for equality of proportions for share with bachelor’s degree or higher, share non-Hispanic white, share with 10 or fewer years in current home.

I used raking (iterative proportional fitting) to weight the Sacramento subsample using all four variables in Table 3.3, as well income ranges (Battaglia, Hoaglin, & Frankel, 2009; Collier, 2018; Mercer, Lau, & Kennedy, 2018). I raked the data using the *anesrake* package in R, which employs the American National Election Study’s weighting algorithm (Collier, 2018).

I did not weight the full Sacramento metro area sample because I do not use it to make inferences about the population of homeowners across the metro area. I primarily use the full sample to estimate a logit model of homeowner willingness to build an ADU.

3.4.4 Gauging Openness to Building an ADU

To gauge how open single-family detached homeowners are to building an ADU, I first asked respondents whether they own an ADU on the same parcel as their current home. For those who did not, I asked if they had “ever attempted to build or considered building an ADU on the same parcel as [their] current home.” I consider homeowners open to building an ADU if they responded either that they (1) were “currently in the process of building an ADU,” (2) were “currently considering building an ADU,” but were “not yet in the permitting or construction process,” (3) had “attempted to build an ADU in the past,” (4) had “considered building an ADU in the past,” but had “never attempted to permit or build one,” or (5) “would consider building one in the future.” I categorize respondents as unwilling to build an ADU if they answered that they “do not want an ADU on the same parcel as [their] home.”

I use my weighted 396-person Sacramento subsample to infer the citywide share of single-family detached homeowners that either own or are open to building an ADU. I also use the results from the full Sacramento metro area sample to explore potential ADU interest and supply across California.

3.4.5 Modeling Openness to Building an ADU

To ascertain what surveyed characteristics most strongly correlate with homeowner openness to building an ADU, I estimated a binomial logistic regression (logit) model using the glm function in R and the full Sacramento metro area homeowner sample (n = 460). Logistic regression is appropriate for modeling the relationship between a binary dependent variable and a set of covariates (Hosmer, Lemeshow, & Sturdivant, 2013). The dependent variable in my model is the binary measure of homeowner openness to building an ADU described above.

My conceptual model is that homeowner openness to building an ADU is a function of familiarity with ADUs, experience with construction and property management, neighborhood preferences, physical housing characteristics, and socioeconomic characteristics. I base my conceptual model on the past studies of ADUs and ADU ownership reviewed earlier, as well as informal discussions with homeowner acquaintances about what would be important to them when considering whether to build an ADU. Figure 3.3 illustrates the conceptual model.

FIGURE 3.3 – Conceptual Model

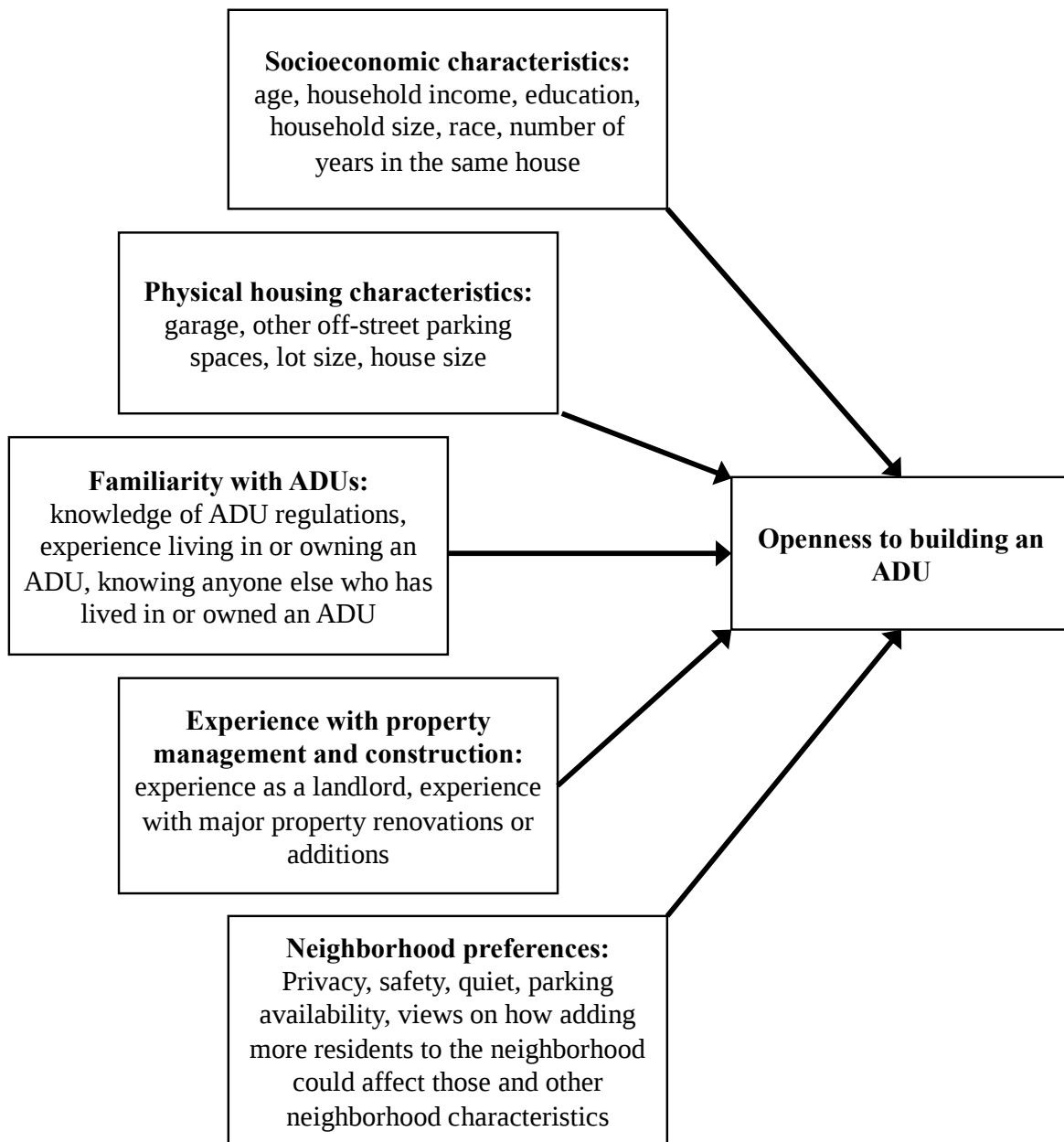


Table 3.4 shows the survey questions I used as proxies for the explanatory factors in my conceptual model and the direction of the effect I expected each would have on homeowner openness to building an ADU. Appendix A provides the full list of survey questions.

Reporting potential problems with ADU renters in the neighborhood – parking, noise, privacy, order and safety, and more residents generally – serves as my proxy for how important those issues are to homeowners for neighborhood quality. This is consistent with reports that homeowner opposition to ADUs is frequently fueled by concerns about traffic congestion, parking, privacy, disorder, and increased population density (Anacker & Niedt, 2019; Antoninetti, 2008; Kettell, 2015; Liebig et al., 2006; Mukhija et al., 2014; Wegmann & Chapple, 2012).

TABLE 3.4 – Survey Question Measures and Expected Effect on Openness to Building ADUs

Explanatory Factor Category	Survey Proxies	Operationalization in Model	Expected Effect (+/-/?)
<i>Socioeconomic Characteristics</i>	Age	Numeric	-
	Household income	Equal income intervals converted to numeric values (1 to 9)	?
	Education	Bachelor's degree or higher (dummy)	+
	Household size	Numeric	-
	Race	Non-Hispanic white (dummy)	-
	More recent mover	Lived in the same house for 10 or fewer years (dummy)	+
<i>Physical Housing Characteristics^a</i>	Garage	Has a garage (dummy)	+
	Other off-street parking spaces (outside a garage)	Numeric	+
<i>Familiarity with ADUs</i>	Has owned or lived in an ADU or knows someone who has	Yes/no (dummy)	+
	Knows that ADUs are allowed in their neighborhood ^b	Yes/no (dummy)	+
<i>Experience with Property Management and Construction</i>	Experience as a landlord (either long-term or short-term rentals)	Yes/no (dummy)	+
	Experience with major property renovations or additions	Yes/no (dummy)	+
<i>Neighborhood Preferences</i>	Neighbor renting an ADU would cause <i>parking</i> problems	Yes/no (dummy)	-
	Neighbor renting an ADU would cause <i>noise</i> problems	Yes/no (dummy)	-
	Neighbor renting an ADU would reduce <i>privacy</i>	Yes/no (dummy)	-
	Neighbor renting an ADU would cause problems with <i>unruly tenants</i>	Yes/no (dummy)	-
	Neighbor renting an ADU would cause <i>other</i> problems	Yes/no (dummy)	-

Note:

a. This would ideally include house and lot size, but the survey did not ask about these.

b. All cities and counties in which survey respondents lived permitted ADUs on lots with single-family detached homes at the time the survey was administered.

Before fitting the logit model, I first tested for collinearity between the 17 predictor variables listed in Table 3.4 by calculating Goodman and Kruskal's tau for all pairs of covariates using the GoodmanKruskal package in R. Goodman and Kruskal's tau measures the strength of association between categorical variables or numerical variables whose discrete values are treated as factor levels (Southwood, 1974). I found no indication of collinearity between the covariates from the calculated tau values. The generalized variance inflation factors I calculated after estimating the logit model likewise indicated no collinearity between the 17 predictor variables.

The full 17-predictor model appeared to be a good fit for the data. I ran the Hosmer-Lemeshow test with the ResourceSelection package in R, which compares the observed outcomes to the dependent variable value predicted by the model (Hosmer et al., 2013). The test showed no evidence of a poor fit (p-value = 0.9683; chi-square distribution). However, to reduce overfitting and simplify the model, I tested the significance of the covariates with a likelihood ratio test using the anova function in R. The results showed that nine covariates were less than significant (p-values > 0.1; chi-square distribution): household income, education, race, other off-street parking spaces, knowledge of ADU regulations, experience with renovations, and views that a neighbor renting an ADU could reduce privacy, increase discord, or have an unspecified negative impact. I removed those nine predictors in my final model. Equation 3 shows the general form of my final model of homeowner openness to building an ADU.

$$\begin{aligned} \text{Openness to Building an ADU}_i &= \alpha + \\ &\beta_1(\text{Age}_i) + \beta_2(\text{Household Size}_i) + \\ &\beta_3(\text{Same House for } \leq 10 \text{ years}_i) + \beta_4(\text{Garage}_i) + \end{aligned}$$

$$\begin{aligned}
&\beta_5(\text{Knowing ADU Owners or Renters}_i) + \beta_6(\text{Landlord Experience}_i) + \\
&\beta_7(\text{ADU Renters Cause Parking Problems}_i) + \\
&\beta_8(\text{ADU Renters Cause Noise Problems}_i) + \varepsilon_i
\end{aligned} \tag{3}$$

The final model appears to be a good fit for the data. The Hosmer-Lemeshow test shows no evidence of a poor fit (p-value = 0.774). The final model also has a lower Akaike Information Criterion than the full model (571.51 versus 585.42), indicating a more parsimonious fit.

3.4.6 Exploring Motivations and Barriers

I used a series of open-ended survey questions to explore in more depth the motivations and barriers that homeowners without an ADU see to building one. To better understand why more than half of the respondent homeowners (246 of 460) were not open to adding an ADU, I asked them to list the top reasons they did not want an ADU on the same parcel as their home. I then categorized and tallied their textual responses (n = 244) by theme. If a response fit more than one theme, I tallied it for each applicable theme.

To flesh out the motivations and barriers facing the 214 homeowners who reported being open to building an ADU, I compiled a list of seven potential motivations for adding an ADU and 13 potential obstacles to building one based on the literature and informal discussions with homeowners (I also added a text-entry “other” option to both lists). I then asked the respondents to rank each one on a 3-point Likert scale from no motivation/not an obstacle to major motivation/major obstacle, and I calculated average rankings for each motivation and obstacle.

3.4.7 Limitations

In this study, I estimate, model, and qualitatively explore the openness of homeowners in the Sacramento metro area to building an ADU on the same lot as their primary residence. In doing so, I assume that each respondent homeowner speaks for her entire household. I cannot, however, guarantee that every decisionmaker in the respondent homeowners' households would be equally willing to consider building an ADU.

I also cannot guarantee that I included every relevant factor in my logit model of openness to building an ADU. Variables I would have included if I had sufficient data include the house and lot size of respondents' primary homes, and whether their homes were in communities with homeowners' associations (HOAs). It is also possible that the physical and demographic characteristics of respondents' neighborhoods affect their openness to adding an ADU separately from respondents' individual socioeconomic characteristics, physical housing characteristics, and neighborhood preferences. I expect that the effects of neighborhood characteristics on homeowners' openness to ADUs are dwarfed by the effects of their individual characteristics and preferences. But future research should explicitly examine this. My data on the location of respondents' homes was not fine-grained enough to assess neighborhood-wide characteristics, though I found no statistically significant differences in the share of homeowners open to building an ADU between the three cities with at least 10 respondents (Sacramento, Davis, and West Sacramento).

Finally, I cannot say what percentage of homeowners who report being open to building an ADU will ever actually add one. People often do not do what they say they will do (or are open to doing) (Train, 2002). Even the respondents who were open to adding an ADU reported numerous potential obstacles to doing so. But the 2019 statewide relaxation of ADU regulations

should reduce if not eliminate some of those barriers. And the daylighting of homeowners' obstacles in research like this study should help local and state governments tackle the barriers even more effectively.

3.5 ARE HOMEOWNERS OPEN TO BUILDING ADUS?

Overall, 8% of respondent homeowners reported owning an ADU on the same lot as their primary residence. Excluding those 42 ADU owners, 47% (214) of the remaining 460 homeowners indicated they would be open to building an ADU on the same lot as their primary home.

I know of only three other studies besides mine that surveyed a full spectrum of single-family homeowners (not just older adults) about their openness to building ADUs on the same lot as their primary home. The City of Sausalito Community Development Department (2011) found that only 22% of respondent homeowners had considered adding an ADU and 21% would be “inclined to create one” if the city’s zoning allowed them. But only 50% of respondents owned single-family homes, which likely reduced the share of respondents open to creating an ADU those without single-family homes usually have worse space constraints. Indeed, the two studies that focused just on single-family homeowners found a substantially greater willingness of homeowners to consider building an ADU. In Rudel’s (1984) study of Babylon, New York, over 40% of respondent homeowners reported that they were “considering” building an ADU. And in the most recent and geographically comparable study, Wegmann and Chapple (2012, 2014) found that 16% of respondent Bay Area homeowners reported having an ADU on their single-family lots, and that 31% of respondents without ADUs had either already attempted to build an ADU, were actively planning to build one, or would consider doing so in the future

(Wegmann & Chapple, 2012). Table 3.5 compares my results to those of Wegmann and Chapple's (2012, 2014).

TABLE 3.5 – Overall Homeowner Openness to Building an ADU

	Percentage of Homeowners with ADUs	Percentage of Homeowners Open to Building an ADU^a	Combined Percentage of Homeowners with ADUs or Open to Building One
<i>Sacramento Area (my study, 2019)</i>	8% (42/502)	47% (214/460)	51% (256/502)
<i>Berkeley, Oakland, and El Cerrito (from Wegmann & Chapple, 2012)</i>	16% (81/508)	31% (~125/404)	42% (206/485) ^b

Notes:

a. Denominator for the Sacramento metro area study (n = 460) equals the number of respondent homeowners who did not report owning an ADU on the same lot as their primary residence (502 minus 42). Denominator for the Bay Area study (n = 404) equals the number of non-ADU-owning respondents who answered the question about why they did not have an ADU.

b. Denominator (n = 485) calculated from Wegmann and Chapple (2012) as the number of ADU owners (n = 81) plus the number of respondents without an ADU who answered the question about why they did not have one (n = 404).

Respondents to my survey (47%) were over 1.5 times more likely than the Bay Area respondents (31%) to indicate a willingness to build an ADU, but half as likely (8% versus 16%) to already have an ADU on the same lot as their primary residence (Table 3.5). There could be many reasons for these differences. For example, the single-family detached housing stock in the Oakland metropolitan division is much older than in the Sacramento metropolitan statistical area, and its homeowner residents have lived in their homes longer (U.S. Census Bureau, 2011). The older housing stock could help explain the greater prevalence of ADUs amongst the Bay Area respondents – older houses have simply had more time for ADU construction. Conversely, the longer tenure of the average homeowners in the Bay Area relative to the Sacramento area could help explain why a lower percentage of Bay Area respondents indicated a willingness to add an ADU – both previous studies (Gebhardt et al., 2018; Varady, 1988) and my logistic regression

results discussed below indicate that longer-tenured homeowners might be less likely than more recent movers to be open to building an ADU.

The timing of the two studies could also help explain why a greater percentage of Sacramento-area respondents expressed openness to building an ADU. Wegmann and Chapple conducted their study at the tail end of the Great Recession, when housing values had plummeted and fewer homeowners were likely thinking about new construction and adding units (Fulton, 2020). In 2019, by contrast, the housing market and economy had rebounded. Furthermore, by 2019 ADUs had become a frequently discussed topic in the news media, state legislatures, and local governments, and numerous companies had begun offering ADU-specific construction and financing products and services (Casey, 2019a; Congel, Clark, & Cizeau, 2019; Nick-Kearney, 2019; Norris, 2019; Sanchez-Moyano & Galante, 2016; Spevak, 2019).

Regardless of their differences, though, the results from both studies indicate a substantial potential market for new ADU construction across the state. California had nearly 6,000,000 owner-occupied single-family detached housing units as of 2018, according to the American Community Survey's 2018 1-year estimate (U.S. Census Bureau, 2018a). Table 3.6 shows how many of those households might be open to building an ADU if I extrapolate the results from my survey and Wegmann and Chapple's (2012) survey. More than 1.5 million homeowners could be open to building an ADU if the ADU ownership and willingness percentages from Wegmann and Chapple's Bay Area survey held across the state. That number increases to more than 2.5 million if I apply the lower ADU ownership and higher ADU willingness percentages from my Sacramento-area survey.

TABLE 3.6 – Potential for New ADUs on Owner-Occupied Single-Family Lots in California

Source of ADU Ownership and Openness Percentages	Total Owner-Occupied Single-Family Detached Units^a	Owner-Occupied Single-Family Detached Units without ADUs (% of total)	Units with Homeowners Open to Building an ADU (% of total units without ADUs)
<i>My Survey (2019)</i>	5,898,001	5,426,161 (92%)	2,550,296 (47%)
<i>Wegmann & Chapple (2012)</i>	5,898,001	4,954,321 (84%)	1,535,840 (31%)

Notes:

- a. Source: Table S2504 from the American Community Survey's 2018 1-year estimates (U.S. Census Bureau, 2018a).

The extrapolated numbers in Table 3.6 are, of course, thought experiments only. I cannot extrapolate my survey results to homeowners statewide with statistical confidence because I did not survey homeowners outside the Sacramento area. Nor can I say what percentage of homeowners who report being open to building an ADU will ever actually add one, as discussed above.

Regardless, the results suggest that ADUs have significant potential to help California close its housing supply gap and achieve Governor Newsom's goal of adding 3.5 million more homes by 2025 (Dillon, 2019b; Woetzel et al., 2016). The 2019 statewide relaxation of ADU regulations will make widespread ADU construction even more feasible, particularly if local governments quickly comply with the new laws and educate homeowners accordingly, which is not always a guarantee (California Association of Realtors, 2019; Casey, 2019b; Dillon, 2019a).

3.5.1 Overall Willingness in the City of Sacramento

I can only extrapolate my survey results to the population of California homeowners as a thought experiment. But I can extrapolate my results to the population of single-family detached homeowners in the City of Sacramento with some statistical confidence. To do so, I use the weighted 396-person Sacramento subsample as described earlier.

My results show that 8.3% of homeowners in the weighted subsample own an ADU on the same lot as their primary residence. And 47.3% of homeowners either own an ADU or would be willing to consider adding one. Extrapolating from the weighted sample to the city using a 95% Wald-type confidence interval indicates that between 40.4% and 54.1% of single-family detached homeowners in Sacramento either own an ADU on the same lot as their primary residence or would be open to building one. That range accounts for the increased variance (design effect of 1.93) caused by weighting the sample (Franco, Little, Louis, & Slud, 2019; Salganik, 2006).

Table 3.7 applies the combined ADU ownership and interest percentage from the weighted Sacramento sample to the nearly 80,000 owner-occupied single-family detached houses in the city. I estimate that 32,884 to 43,580 of those households either already have an ADU or could be open to building one on the same lot as their primary residence. Even the low end of that range exceeds the 21,216 housing units the city estimated could be accommodated on vacant sites between 2013 and 2021, according to the 2013-2021 Housing Element of the city's 2030 General Plan (City of Sacramento, 2013). These results indicate that ADUs hold substantial potential to help Sacramento meet its growing housing needs, including its 2021-2029 Regional Housing Needs Allocation of 45,580 units (Sacramento Area Council of Governments, 2020). That potential is even greater when paired with the recent statewide liberalization of ADU regulations, which the city has already incorporated into its city code (City of Sacramento, 2020).

TABLE 3.7 – Potential for ADUs on Owner-Occupied Single-Family Lots in Sacramento

Total Owner-Occupied Single-Family Detached Units^a	Single-Family Detached Units with ADUs or Homeowners Open to Building an ADU (% of total owner-occupied single-family detached units)	Sacramento's Estimated Capacity for New Housing Units on Vacant Land^b
79,816	32,884 – 43,580 (40.4-54.1%; 95% CI)	21,216

Notes:

a. Source: Table S2504 from the American Community Survey's 2018 1-year estimates (U.S. Census Bureau, 2018a).

b. Source: City of Sacramento (2013)

3.6 WHICH HOMEOWNERS ARE MORE LIKELY TO BE OPEN TO BUILDING AN ADU?

My binomial logistic regression model reveals that familiarity with ADUs, experience with property management, neighborhood preferences, physical housing characteristics, and socioeconomic characteristics all affect whether a homeowner is willing to consider building an ADU. Table 3.8 summarizes the results from my final logit model. I report my results as odds ratios (rather than the natural log of odds) for ease of interpretation (Hosmer et al., 2013). The odds ratios for the six dummy variables show the odds of a homeowner in the subject group being open to building an ADU relative to the odds of homeowners not in that group being open to adding an ADU, holding all other covariates constant. The odds ratios for the two continuous predictors (age and household size) indicate the relative change in the odds of a homeowner being open to building an ADU with a one-unit increase in that variable, holding all other covariates constant. Values greater than one show that the odds of being open to adding an ADU increase if the characteristic is present (dummy variables) or if the variable increases (continuous predictors). Values less than one indicate the opposite.

TABLE 3.8 – Logistic Regression Results for Openness to Building an ADU (Odds Ratios)

<i>Predictors</i>	Open to Building an ADU		
	<i>Odds Ratios</i>	<i>Confidence Intervals</i>	<i>p-values</i>
(Intercept)	1.05	0.23 – 4.75	0.950
Age	0.99	0.97 – 1.01	0.420
Household size	1.14	0.97 – 1.34	0.126
Same house for ≤ 10 years (dummy)	2.07	1.28 – 3.38	0.003
Garage (dummy)	0.51	0.21 – 1.16	0.115
ADU familiarity (dummy)	2.42	1.59 – 3.69	<0.001
Landlord experience (dummy)	1.76	1.07 – 2.92	0.028
ADU renters cause parking problems (dummy)	0.62	0.40 – 0.96	0.032
ADU renters cause noise problems (dummy)	0.51	0.30 – 0.85	0.010
Observations	460		
R ² Tjur	0.165		

The results of my final eight-predictor model show that five covariates have statistically significant correlations with homeowner openness to building an ADU. Homeowners who have lived in the same house for 10 years or less have 2.07 times (107%) greater odds of being open to adding an ADU on the same lot as their primary residence. Homeowners familiar with ADUs have 2.42 times (142%) greater odds. And homeowners who have experience as a landlord have 1.76 times (76%) greater odds. By contrast, homeowners who think that their neighbor renting out an ADU would have a negative effect on neighborhood parking or noise levels have just over half the odds (62% and 51%, respectively) of being open to adding an ADU as homeowners who do not share those concerns.

3.6.1 Socioeconomic Correlates

Previous studies of ADU owners indicate through bivariate comparisons that they do not differ much in age or household income from other homeowners (M. J. Brown & Palmeri, 2014; Chapman & Howe, 2001; Gebhardt et al., 2018; Rudel, 1984; Wegmann & Chapple, 2012). My results similarly indicate that age and household income do not correlate in a discernible manner with openness to creating an ADU. I dropped the income variable before the final model due to statistical insignificance. And age has an effectively neutral association with openness to building an ADU in the final model, with a 95% confidence interval spanning (and hugging) one. These results also make some theoretical sense – ADUs can benefit homeowners of all ages and incomes (Geffner, 2018). Younger homeowners might want to house an aging parent, or might need extra income to afford the mortgage on their first home. Middle-aged homeowners might want to house an adult child returning from college or fill extra capacity left by their children leaving the house. Older households might want to house a family member or caregiver, or they might want to supplement their incomes in retirement.

As with age and income, my regression results also show insignificant associations between openness to adding an ADU and education (dropped before the final model), race (dropped before the final model), and household size. That runs counter to my expectations, which were based primarily on bivariate comparisons from previous studies of ADU owners that indicate they might have smaller households (Chapman & Howe, 2001; Rudel, 1984), have higher levels of education (Gebhardt et al., 2018; Wegmann & Chapple, 2012), and be more racially diverse (Gebhardt et al., 2018; Maaoui, 2018; Wegmann & Chapple, 2012). But

Varady's (1988, 1990) discriminant analyses of older homeowners (aged 59+) showed, similar to my results, that education and race have no significant impact on ADU interest.

One possible explanation for my result on education is that education is primarily a proxy for familiarity with ADUs. Varady (1990, p. 94) hypothesized that "the more highly educated . . . would be more likely to be aware of this non-traditional housing option from information in newspapers, magazines, etc." My regression model includes a more explicit proxy for ADU awareness (familiarity), which could have at least contributed to the insignificant association in the full model between education and openness to building an ADU. Another possibility is that education level does not in fact impact initial interest in creating an ADU, but homeowners with more formal education are more successful at actually building ADUs.

The one demographic variable with a significant association in my final model is respondents' length of residency in their home. Homeowners who have lived in the same house for 10 years or less have 2.07 times greater odds of being open to adding an ADU. That is consistent with the lone related study I found on ADU owners (Gebhardt et al., 2018). It is possible that longer-tenured homeowners are less interested in adding an ADU because they have grown attached to their homes or neighborhoods as they are.

3.6.2 The Effect of Having a Garage

Garage conversions are one of the most common – and commonly touted – types of ADUs (A. Brown et al., 2017; Chapple et al., 2017). One likely reason for that is because homeowners frequently do not use their garages to store vehicles, thereby creating additional housing space (Arnold, Graesch, Ragazzini, & Ochs, 2012; Guo, Rivasplata, Lee, Keyon, & Schloeter, 2012; Wegmann, 2015b). As a result, I hypothesized that having a garage would correlate with greater

openness to building an ADU. But my results indicate that owning a garage might actually decrease the odds of being open to building an ADU.

The modeled association shows that homeowners who own a garage ($n = 429$) have just over half the odds (51%) of being open to adding an ADU as homeowners who do not ($n = 31$). The association is not statistically significant using a 95% confidence interval (0.05 p-value), since the interval spans zero (0.21 to 1.16), or “no effect.” But it is close. The bulk of the distribution lies below zero. And the association would be statistically significant using an 88% confidence interval (0.12 p-value). So, the potential association is worth exploring, particularly since it runs counter to my expectations.

The negative association between owning a garage and being open to building an ADU could indicate a neighborhood type or preference effect rather than a structural amenity affect, in at least two respects. First, houses in farther-out suburban neighborhoods are more likely to have garages (and larger garages) than houses in denser urban areas. Yet farther-out suburban areas might be less appealing for ADU renters because they tend to be less accessible to jobs, services, and other amenities (Wegmann & Nemirow, 2011). Suburban homeowners might thus be more reluctant to build an ADU because of a potentially weaker market for ADUs in their neighborhoods.

Second, suburban homeowners might also have different neighborhood preferences, which cause them to be less open to ADUs. Brown and Cropper (2001), for example, found that residents of a New Urbanist subdivision in Utah were significantly more likely than residents of a standard suburban subdivision to favor ADUs, favor ADUs above garages, and agree that residents should be able to build ADUs. My results also show that two of my proxies for

neighborhood preferences have significant associations with openness to creating an ADU, as discussed below.

Future research should more directly assess the roles of neighborhood type and preferences in homeowners' attitudes towards ADUs. More research is also needed on how people use garages and the incentives affecting their use (Guo et al., 2012).

3.6.3 Familiarity with ADUs

As I expected, familiarity with ADUs has the strongest (greatest magnitude) association with openness to building an ADU. Homeowners who know someone who owns or has lived in an ADU, or who have done so themselves, have 2.42 times (142%) greater odds. This highlights the role of education – whether by governmental agencies, civil society organizations, the private sector, the media, or social exposure to other ADU owners (Pan & Pirinsky, 2015) – in fostering ADU interest and enough know-how to empower homeowners to attempt creating one. My finding is also consistent with previous research and recommendations. For example, 15% of the ADU owners surveyed by Chapple et al. (2017, p. 19) in Portland, Seattle, and Vancouver listed learning about ADUs through an “educational website, event, or tour” as a top factor leading them to “pull the trigger” on creating an ADU. As the authors concluded, a “big part of winning hearts and minds in the battle for more ADUs is simply raising awareness” (Chapple et al., 2017, p. 23). I spoke to one planner in the Sacramento metro area who went so far as to opine that California’s liberalization of ADU regulations would increase ADU permitting more because of the increased media attention on ADUs and consequent homeowner awareness than the actual regulatory relaxations. In short, there appears to be a “definite need for clarity in municipal

regulations and for education about laws surrounding accessory dwellings, building permits, allowed uses, and general requirements” (Mukhija et al., 2014, p. 112).

3.6.4 Experience with Property Management

Research on ADU owners shows that extra rental income is a primary motivation for building an ADU (Chapman & Howe, 2001; Brown & Palmeri, 2014; Chapple et al., 2017) and that most ADUs are in fact used as either long-term or short-term rental housing (Brown & Palmeri, 2014; Chapple et al., 2017; Gebhart et al., 2018). I therefore expected homeowners to be more open to adding an ADU if they had experience with the rental process, either from renting a room in their home or renting a separate property. Those homeowners would have a lower “activation energy” for building and renting an ADU because they more likely to understand rental laws, property maintenance customs, and how to interact with renters. My results support my expectation. Homeowners with experience as a landlord have 1.76 times (76%) greater odds of being open to creating an ADU than other homeowners.

3.6.5 Neighborhood Preferences

There is a dearth of research on how homeowners’ neighborhood preferences affect their interest in ADUs. However, it is well documented that homeowner opposition to ADUs is frequently fueled by concerns about traffic congestion, parking, privacy, disorder, and increased population density – i.e. changes to neighborhood characteristics (Antoninetti, 2008; Libeig et al., 2006; Anacker & Niedt, 2019; Wegmann & Chapple, 2012; Kettell, 2015; Mukhija et al., 2014). And at least one study found that residents of a New Urbanist subdivision were more likely to favor

ADUs than residents of a standard subdivision (Brown & Cropper, 2001). I thus expected that homeowners' neighborhood preferences would affect their openness to building an ADU.

My results support my hypothesis. My proxies for the importance of neighborhood parking and quietude are both significantly associated with ADU interest. Homeowners who think that their neighbor renting out an ADU would have a negative effect on neighborhood parking or noise levels have just over half the odds (62% and 51%, respectively) of being open to adding an ADU as homeowners who do not share those concerns. This highlights a need for research to track changes in neighborhood characteristics – like parking – following ADU additions to test whether evidence supports residents' fears about neighborhood decay. Future research should also more directly measure homeowners' neighborhood preferences and how they affect their views on ADUs.

3.7 HOMEOWNER MOTIVATIONS AND BARRIERS

The responses to my open-ended survey questions allowed us to explore three questions left largely unanswered in the literature: (1) why some homeowners are not interested in creating an ADU, (2) what motivates those homeowners who are open to building an ADU, and (3) what barriers those interested homeowners expect to face.

3.7.1 Reasons for Not Wanting an ADU

I asked the 246 respondents who were not interested in building an ADU to list the top reasons they did not want one, a question not explored in any of the studies I reviewed. The 244 respondents who answered the question provided a total of 303 rationales, which I then

categorized. Table 3.9 shows my nine categories of reasons, along with examples of homeowners' responses, and the number and percentage of respondents who cited each reason.

The most frequently listed “top” reasons for not wanting an ADU were not enough space or structural impediments (49.6% of respondents), no need (29.5%), and privacy concerns (10.2%). All other rationales were cited by 7.0% of respondents or less – cost (7.0%), difficulty maintaining the ADU or managing tenants (6.1%), personal or neighborhood quality concerns besides privacy (6.1%), zoning incompatibility or HOA restrictions (5.3%), permitting, design, or construction-related hassles (4.5%), and other reasons (5.7%).

TABLE 3.9 – Respondents’ “Top Reasons” for Not Wanting an ADU

Category of Reasons	Examples	# Listing Reason in Category	% Listing Reason in Category^a
<i>Simply do not want or do not need</i>	“Don’t want;” “I just want my property as it is;” “Home is perfect the way it is;” “I do not have any desire;” “I do not feel that it is necessary;” “Don’t need the income”	72	29.5%
<i>Cost</i>	“Too costly;” “The expense;” “The cost and time to build;” “Not within my budget;” “Would increase my property taxes;” “Can’t afford it”	17	7.0%
<i>Zoning incompatibility or HOA restrictions^b</i>	“It is against the CC&R’s;” “My house falls within a homeowners association, where it is not allowed to have an ADU;” “Not allowed in my neighborhood;” “Not allowed by HOA”	13	5.3%
<i>Hassles with permitting, design, construction, or related</i>	“It’s too complicated;” “Too much work;” “Unfamiliar with the laws;” “Seems like a hassle;” “Too much hassle”	11	4.5%
<i>Not enough space or structural impediments</i>	“Not enough space;” “I like having a big backyard;” “My current home’s footprint takes up most of the parcel space;” “No room;”	121	49.6%

	“My lot is an odd shape and there isn’t room for an ADU;” “My home is not structured to have an ADU;” “No room to it an ADU in without destroying the minimal space currently occupied by attractive and mature landscaping;” “I like keeping both cars in the garage so would not consider converting it to a studio apt.”		
<i>Difficulty maintaining the ADU or managing tenants</i>	“Management of property;” “Do not want to deal with the complications it brings;” “Don’t want to worry about being a landlord and the responsibilities that go along with that;” “I don’t want to deal with a tenant and manage the property;” “Would be a bother to manage;” “Don’t want to take care of another building”	15	6.1%
<i>Privacy concerns</i>	“Privacy;” “Strangers in the back yard, no thank you;” “My home & property is MINE & MINE ALONE;” “I like my privacy and space;” “I don’t want anybody to be too close to me;” “I enjoy my privacy and I have a young child that I wouldn’t want exposed to people I don’t know and/or trust well enough;” “I have my personal home for my family. I do not want to turn it into an apartment-type situation;” “I like to be naked in my backyard”	25	10.2%
<i>Other personal or neighborhood quality preferences</i>	“Interference with peace and quiet;” “I think vacationers and short term renters are a nuisance;” “Ghetto looking;” “With dogs, kids, and a swimming pool, I don’t want the liability of an ADU on the same parcel as my home;” “Congestion, parking issues, security;” “I don’t want another car on my street since I don’t have another place to park a car;” “Ugly”	15	6.1%
<i>Other reasons</i>	“I just bought my house;” “I think I would just move to another place adding an ADU;” “Decreased the value of my home;” “Planning to sell within 3 years;” “I plan to downsize, by selling my house and even build an ADU somewhere else out of this neighborhood”	14	5.7%
Total	-	303	-

Notes:

- Does not sum to 100% because respondents could list more than one reason.
- HOA restrictions = Homeowners’ association (HOA)-enforced covenants, conditions, and restrictions (CC&Rs)

Looking at the most frequently cited rationale – lack of space or structural impediments – homeowners’ responses fall largely into two buckets. In the first bucket are responses indicating that it would be physically impossible to fit an ADU in the respondent’s home or on their lot, like the following:

- “My lot is an odd shape and there isn’t room for an ADU.”
- “Our property is not large enough to build any kind of additional building. There’s barely enough room for our small utility shed.”
- “No room for it.”
- “No space.”
- “Our backyard is already very small and there is no place to add an additional dwelling.”
- “I don’t believe there is room in my current location or logistically that I could make it work. That being said, if I were to ever move, I wouldn’t mind having an ADU for my aging mother and/or my now college-age daughter.”

The second (and smaller) bucket contains responses indicating that the homeowner enjoys having their space and does not want to sacrifice it for an ADU, like the following:

- “I like having a big backyard.”
- “No room to fit an ADU in without destroying the minimal space currently occupied by attractive and mature landscaping.”
- “I like keeping both cars in the garage so would not consider converting it to a studio apt.”
- “Small lot; prefer garden and landscaping and open space.”

The first bucket of space-related rationales highlights a major logistical challenge for many homeowners in building an ADU. Space- or design-related issues were the “biggest challenge” most commonly cited by ADU owners in two of the only three studies I found that explored owner-reported obstacles (Brown & Palmeri, 2014; Gebhart, 2018). In California, the state’s 2019 amendments to the Second Unit Law should relieve several space-related impediments – e.g. reducing rear- and side-yard setbacks, prohibiting minimum lot size requirements for ADUs, prohibiting lot coverage, floor area ratio, or open space requirements that would prevent construction of an 800-square-foot ADU, prohibiting requirements to replace covered off-street parking spaces converted into an ADU, and requiring “by right” approval of JADUs (small, more efficiently provisioned internal ADUs) (Government Code Section 65852.2). Future research should investigate whether those regulatory relaxations correlate to reduced space-related concerns and increased interest in building ADUs.

The second bucket of space-related rationales highlights more intransigent opposition to creating an ADU. They reflect personal preferences rather than logistical obstacles, similar to homeowners’ second-, third-, and fifth-most frequently listed rationales for not wanting an ADU – simply not wanting or needing one (29.5%), privacy concerns (10.2%), and other personal or neighborhood quality preferences (6.1%). These rationales include responses like the following:

- “I don’t need one, and I don’t want anybody else living on my property. I also think it is disrespectful to neighbors to change the character of the neighborhood by adding density.”
- “Home is perfect the way it is.”
- “Don’t need the income.”

- “Strangers in the back yard no thank you.”
- “Congestion, parking issues, security.”
- “I like to be naked in my backyard.”

It is unlikely that relaxing ADU restrictions, streamlining the permitting process, or even reducing ADU construction costs or financing barriers will directly change these types of preferences. However, changes in a homeowner’s circumstances – e.g. needing additional income or having a family member fall ill – could cause them to revisit ADUs. In addition, social influence can affect housing decisions (Pan & Pirinsky, 2015). So, it is possible that increased ADU construction amongst other homeowners and heightened media attention could foment or contribute to a broader-scale shift in housing and neighborhood preferences. This is an area for future research.

In contrast to the preference-driven rationales characterizing most of respondents’ “top reasons” for not wanting an ADU, a sizeable minority of homeowners cited obstacles that – like the first bucket of space-related rationales – could be at least partially obviated by governmental and private sector actions. Seven percent of respondents cited cost as a top reason; 5.3 percent listed zoning incompatibility or HOA restrictions; and 4.5 percent mentioned hassles with permitting, design, or construction. In California, the regulatory relaxations should substantially reduce zoning restrictions and eliminate at least the most egregious HOA restrictions, as discussed above (Government Code Section 65852.2; Civil Code Section 4751). They will also reduce ADU impact fees. While evidence from similar Cascadian real estate markets indicates that fees do not often constitute a large share of total ADU costs (Chapple et al., 2017), studies

have also found that ADU production soared after Portland waived its system development charge (multi-purpose impact fee) for new ADUs (Gebhart et al., 2018; Chapple et al., 2017).

The state's regulatory relaxations and its mounting housing crisis have also spurred some local governments to streamline and simplify their permitting processes, and even help homeowners finance their ADUs. San Jose, for example, has a dedicated "ADU Ally" to field ADU-related questions, provides an "ADU Universal Checklist" to help homeowners navigate the permitting process, maintains a website with an ADU FAQ and page and many other resources, and hosts "ADU Tuesdays" events providing expedited plan review and permitting ADUs (City of San Jose, 2020). San Jose also provides forgivable loans up to \$20,000 to cover homeowners' pre-development "soft" costs, so long as they rent the ADU at below market rates for five years (Hase, 2019). Meanwhile, San Diego provides free, pre-approved ADU floor plans to help homeowners avoid pre-development soft costs (City News Service, 2019).

3.7.2 Motivations for Considering an ADU

I asked the 214 homeowners who reported being open to building an ADU to rank eight potential motivations on a 3-point scale from no motivation to major motivation. Table 3.10 shows that housing oneself, a friend, or a family member in the future was the clear top choice (2.46 average ranking). It was the only response that was cited as a major motivation by close to half of respondents. Creating an office or other activity space was the second most highly ranked motivation (2.17). And financial motivations had the third and fifth highest rankings (2.14 for increasing property value; 2.02 for extra income from renting the ADU).

TABLE 3.10 – Ranking Respondents’ Motivations for Building an ADU

Motivation	Average Ranking^a
Housing self, family member, or friend in the future	2.46
Creating an office or other useful activity space	2.17
Increasing property value	2.14
Housing self, family member, or friend now	2.08
Additional income from renting the ADU	2.02
Creating additional storage space	1.86
Helping with the housing crisis	1.77
Other	1.20

Notes:

a. 1 = “No motivation;” 2 = “Minor motivation;” 3 = “Major motivation”

It is unsurprising that housing family members or friends is a major motivation for homeowners interested in building an ADU. Most ADUs are used for housing (Brown & Palmeri, 2014; Chapple et al., 2017; Gebhart et al., 2018). And housing family, friends, caregivers, or other helpers has been cited as a top motivation in previous surveys of both ADU owners and homeowners without ADUs (Table 3.11).

However, in each of the six studies shown in Table 3.11, extra income was the most frequently listed motivation. Housing others came in second or lower. That indicates a potential difference between homeowners in the Sacramento metro area and those in Cascadia, Babylon, and Sausalito, or at least the sampled homeowners in those areas. Perhaps this disparity relates to the severity of California’s housing crisis, with homeowners seeking to provide shelter for friends and family being displaced by high rents. On the other hand, homeowners ranked “helping with the housing crisis” last out of all the specific (non-“other”) motivations (Table 3.10). Either way, a potential upshot is that Sacramento area homeowners who are motivated more by housing family members or friends than garnering rental income might be more willing to rent their ADUs at affordable rates.

TABLE 3.11 – Greatest Motivations Reported in Previous Studies

	Gebhart et al. (2018)^a	Chapple et al. (2017)	Brown & Palmeri (2014)	Chapman & Howe (2001)	Rudel (1984)	City of Sausalito (2011)
<i>Location</i>	Portland, OR	Portland, OR; Seattle, WA; Vancouver, BC	Portland, OR	Seattle, WA	Babylon, NY	Sausalito, CA
<i>ADU Owners or Non-Owners</i>	Owners	Owners	Owners	Owners	Non-owners	Non-owners
<i>Sample Size</i>	236	414	200	45	31	55
<i>#1 Motivation</i>	Use as a rental property	Extra income	Rental income	Rental income	Economic return	Extra income
<i>#2 Motivation</i>	Housing family and friends	Housing a family member or helper	Housing a family member or helper	Making mortgage payments affordable	(not reported)	Place for relative to live

Notes:

a. The “motivations” reported from the Gebhart et al. (2018) study are more accurately the respondents’ “original purposes” for their ADUs.

3.7.3 Perceived Barriers to Building an ADU

I asked the 214 homeowners who reported being open to building an ADU to rank 14 potential obstacles on a 3-point Likert scale from no obstacle to major obstacle. Table 3.12 shows the obstacle categories and corresponding average rankings. Construction costs and development fees were the only two obstacles rated as a “major obstacle” (3 on the rating scale) by a majority of respondents. Difficulty working with government staff and issues with regulations were also fairly highly ranked obstacles. Financing difficulties and financial risk were ranked near the bottom of the list, followed by opposition from neighbors, short-term rental limitations, and other concerns.

TABLE 3.12 – Ranking Respondents’ Perceived Obstacles to Building an ADU

Obstacle	Average Ranking^a
Construction costs	2.69
Development fees and permitting costs	2.63
Difficulty working with local government staff (including permitting delays)	2.37
Other zoning restrictions on ADU construction and siting	2.33
ADU setback restrictions	2.30
Confusing ADU regulations	2.28
Difficulty working with contractors (including construction delays)	2.26
ADU parking requirements	2.13
ADU height restrictions	2.12
Difficulty obtaining financing	2.10
Financial risk	2.02
Opposition from neighbors	2.00
Limitations on using ADUs for short-term rentals	1.80
Other	1.41

Notes:

a. 1 = “No obstacle;” 2 = “Minor obstacle;” 3 = “Major obstacle”

These results are generally consistent with the biggest barriers reported by ADU owners. Table 3.13 shows that costs and financing concerns were the most frequently listed major barriers by ADU owners in two of the three relevant studies I found, while regulatory or design-related impediments and the permitting process were the two biggest obstacles reported by respondents in the third study. By contrast, ADU owners surveyed by Chapman and Howe (2001) reported that neighborhood opposition was minimal.

TABLE 3.13 – Greatest Obstacles Reported by ADU Owners in Previous Studies

	Gebhart et al. (2018)	Chapple et al. (2017)	Brown & Palmeri (2014)
<i>Location</i>	Portland, OR	Portland, OR; Seattle, WA; Vancouver, BC	Portland, OR
<i>Sample Size</i>	230	414	200
<i>#1 Obstacle</i>	Regulatory or design- related impediments (combined)	Financing	Cost and financing concerns (combined)
<i>#2 Obstacle</i>	Permitting process	Construction costs	Design constraints

In California, the state’s amendments to its Second Unit Law will reduce – and in some cases eliminate – the three of the top five barriers ranked by Sacramento metro area homeowners, and five of the 14 barriers overall – development fees and permitting costs (ranked 2), other zoning restrictions on ADU zoning and siting (4), ADU setback restrictions (5), ADU parking requirements (8), and ADU height restrictions (9), as discussed above (Casey, 2019c; Government Code Section 65852.2; Civil Code Section 4751). And in adapting to the new regulatory zeitgeist, more local governments are simplifying their permitting processes and expanding their educational programs for homeowners, which should help reduce difficulties working with government staff (3) and confusing ADU regulations (6) (City News Service, 2019; City of Sacramento, 2020; Hase, 2019).

But the state’s regulatory relaxations are unlikely to appreciably reduce construction costs (1) or increase financing opportunities (10). These barriers highlight two things. First, there remains a need for lending programs that allow homeowners to borrow against the future value of the ADU, including rental income (Brown et al., 2017; Chapple et al., 2017; Brown & Watkins, 2012). Adequate loan products are still not widely available, though this is beginning to change. For example, Fannie Mae’s HomeReady loan program includes ADU income as part of qualifying income, though it might actually be difficult for the prospective homeowner to demonstrate that income without a signed lease for the ADU (Fannie Mae, 2019). The California

Housing Finance Agency also considers ADU rent as qualifying income for first-time homebuyers (California Housing Finance Agency, 2017). In addition, some local governments and civil society organizations have begun offering ADU-specific construction and financing products and services – for example, backyard ground-leasing programs, bridge loans, contractor-matching services, zoning research, permit-ready ADU designs, and forgivable construction loans (Casey, 2019a; Congel et al., 2019; Hase, 2019; Housing Trust Silicon Valley, 2020; Nick-Kearney, 2019; Norris, 2019; Spevak, 2019).

The cost and financing barriers also highlight the inequalities of homeowner access to permitted ADUs. My regression modeling indicates that income might not have a statistically significant association with openness to building an ADU. But that belies the disparate impact that cost and financing barriers have on lower-income households. I found at least a small negative correlation between household income and homeowners' rankings of all 14 obstacles shown in Table 3.12 – as income decreases, the obstacle rankings increase. But income had by far the strongest correlation with difficulty obtaining financing ($r = -0.37$). This underscores a need for programs to provide ADU funding assistance to low-income households, which a number of local governments and civil society organizations have piloted or are developing (Andersen, 2019; Diaz, 2019; Hase, 2019). Future research should explore the outcomes of these programs, as well as the income inequality of access to ADUs for both homeowners (or prospective homeowners) and renters.

3.8 CONCLUSION

This study indicates that there is substantial homeowner interest in creating an ADU. As many as 54.1% of Sacramento city single-family detached homeowners could either have an ADU or be

open to creating one. And ADUs could interest even more homeowners with sustained educational outreach by local governments or civil society organizations – I find that familiarity with ADUs has the strongest association with openness to building an ADU out of all the predictor variables in my model. In addition, a sizeable minority of respondents’ rationales for not wanting an ADU are logistical and potentially obviated by zoning reform and other measures to facilitate ADU construction. However, most rationales are driven by less mutable personal preferences.

Of course, being open to building an ADU is not the same as actually creating one. And barriers to ADU production remain. Cost-related concerns ranked as the biggest obstacles to creating an ADU, followed by permitting and regulatory issues. In California, the state’s relaxation of ADU regulations should reduce many of regulatory barriers, as well as some of the permitting- and cost-related barriers. And as a result, ADUs have significant potential to help California close its housing supply gap. Similar results could potentially also occur from similar actions in jurisdictions outside of California. But construction costs and obtaining financing will likely continue to be major impediments to widespread ADU production without changes in lending practices. There is also a need for programs to provide ADU funding assistance to lower-income households, which are disproportionately burdened by cost and financing barriers.

Future research is needed to explore the income inequality of access to permitted ADUs for both homeowners (or prospective homeowners) and renters. Future research should also more directly assess the roles of neighborhood type, neighborhood preferences, and social influence in homeowners’ attitudes towards ADUs. In addition, scholars should continue investigating how California’s regulatory relaxations affect ADU production and homeowner interest in ADUs. More research on ADUs is also needed outside of California and Cascadia.

4. EXPLORING HOW MILLENNIALS CHOOSE WHERE TO LIVE: LIFE CYCLE EFFECTS AND THE CONTINUING IMPORTANCE OF TRANSPORTATION

4.1 ABSTRACT

Millennials – people born between 1982 and 2000 – will drive the United States housing market for years to come. The question is how. Surveys suggest that millennials have a stronger preference than previous generations for urban amenities, like neighborhood walkability, shorter commutes, transportation alternatives, and proximity to shops, restaurants, and other activities. But studies also indicate that suburban populations will continue to grow – even many of the millennials who currently live near urban cores could eventually decamp to the suburbs when they get married, have children, or simply achieve sufficient financial stability to purchase a home. That raises big questions for urban planners and policymakers, as well as for the future of sustainable urbanism. If most millennials will end up suburbanizing, what happens to their erstwhile preferences for urban amenities? And how do millennial households balance any such urban preferences against other household needs, dreams, or expectations? Do they seek out suburban neighborhoods with urban amenities? Do their preferences simply change with time and major life events? In this article, I use in-depth interviews of 20 households who recently purchased homes in the San Francisco Bay Area to explore how millennials choose where to live when they reach the life cycle stages typically associated with bigger homes in suburban areas. I find that life cycle effects emerged in different ways for the households I interviewed. As they partnered and began having or thinking about having children, most households suburbanized or planned to suburbanize in the future. The households still valued urban amenities, but they generally did not prioritize urban amenities when searching for their suburban homes, with one

exception – proximity to commuter transit. The widespread importance of transit access amongst the suburbanizing households highlights the inextricable link between transportation and land use, as well as the potential for millennials to age and suburbanize while minimizing increases in vehicle miles traveled.

4.2 INTRODUCTION

Millennials – people born between 1982 and 2000 – are the largest generation in United States history. With over 83 million members, millennials outnumber even the massive baby boom generation of 75+ million people (Lee, 2020; U.S. Census Bureau, 2015). Millennials are also more racially and ethnically diverse, more technologically adept, and more educated than previous generations, among other differences (Frey, 2018; Lee, 2020; Pew Research Center, 2010; Taylor & Pew Research Center, 2016). They also came of age amidst multiple defining events – the biggest recession since World War II (the “Great Recession” caused by the subprime mortgage crisis), the emergence of climate change as a leading geopolitical issue, legalization of same sex marriage, and the election of America’s first black president, to name just a few (Debevec, Schewe, Madden, & Diamond, 2013; Lee, 2020).

With so many cohort members and such value-shaping experiences and demographic differences, millennials could substantially refashion American society. That includes America’s housing patterns and its built environment generally. Millennials will drive the United States housing market for years to come (Nelson, 2011). One survey showed that millennials already comprised half of all homebuyers by 2016 (Zillow Group, 2016). Survey evidence also suggests that millennials have a greater baseline preference for urban living than previous generations (Myers, 2016; National Association of Realtors, 2017; Nelson, 2011). A major question facing

urban planners, builders, and policymakers is how those preferences affect – or could affect – how and where millennials actually decide to live:

“There’s been this huge wave of people in cities all over the country. Then they grow up. Then what?”

(Shaver, 2017 (quoting Yolanda Cole, owner of a Washington, D.C. architecture firm and chair of ULI Washington)).

“We’re trying to figure out what will drive the younger generation. Will they follow the same patterns of their predecessors, or will they do something different?”

(Shaver, 2017 (quoting Fred Selden, Planning Director for Fairfax County, Virginia)).

In this study, I explore the residential location choices and trajectories of millennials who have reached the life cycle stages typically associated with bigger homes in suburban areas. I take an inductive approach, using in-depth interviews of 20 millennial households who had recently purchased a new home in the San Francisco Bay Area. This article focuses on two themes that emerged from the interviews: life course effects on location choice and the continuing importance of transportation for suburbanizing households.

I find that life cycle effects emerged in different ways for the households I interviewed. As they partnered and began having or thinking about having children, most households sought to purchase homes with more space. Many also sought better school districts. And some just felt it was time to take the “next step” along their envisioned or conditioned residential path. That led most households to either suburbanize or plan to suburbanize in the future.

The households still valued urban amenities, but they generally did not prioritize urban amenities when searching for their suburban homes, with one exception – proximity to commuter transit. Ten of the 12 households that suburbanized – bought a house farther from an urban core than their previous residence – reported including transit access in their top search criteria. And

eight households actually restricted their suburban search options to areas closer to commuter transit. The widespread importance of transit access amongst the suburbanizing households highlights the potential for millennials to age and suburbanize without increasing their driving as substantially as previous generations (Wang & Akar, 2020).

4.3 RESIDENTIAL LOCATION CHOICE AND THE GREAT MILLENNIAL QUESTION

Residential mobility theory has come a long way since the first half of the 20th century, when mobility was viewed as a “pathological phenomenon” that fomented “urban ills such as crime, delinquency and other forms of anomic behavior” (Winstanley, Thorns, & Perkins, 2002, p. 813; Rossi & Shlay, 1982, p. 21). Much modern residential mobility research can be traced to Rossi’s (1955) seminal research on households in Philadelphia. Rossi concluded from his research that mobility was actually normal and not the result of “normlessness” (Rossi & Shlay, 1982, p. 23). And he introduced the theory that household housing needs and desires are conditioned by stages of family life (e.g. marriage, job change, having children, children leaving the house, retirement), and that mobility is the natural outcome of life stage changes – the so-called “life-cycle” model.

Theories have since morphed and multiplied, but major life events remain a key theoretical and empirical determinant of residential mobility, homeownership, and residential location choice (Coulter, van Ham, & Findlay, 2016; Drew & Herbert, 2013; Kim, Horner, & Marans, 2005; Knox & Pinch, 2010; Varady, 1990a). For example, empirical studies have indicated that married couples, households with children, and higher-income households are all more likely to seek homeownership and also transition to bigger homes with more outdoor space in suburban areas (Drew & Herbert, 2013; Kim et al., 2005; Lee, 2020; Liao, Farber, & Ewing,

2015; Varady, 1990a; Zillow Group, 2016). An ongoing debate has raged over whether millennials will ultimately follow this same trend (Blumenberg, Brown, Ralph, Taylor, & Turley Voulgaris, 2019; Lee, 2020; Myers, 2016; Raymond, Dill, & Lee, 2018).

Evidence suggests that millennials have a stronger preference than previous generations for neighborhood walkability, shorter commutes, transportation alternatives, and proximity to and variety of shops, restaurants, and other activities – all of which are more commonly found in denser urban areas than farther-flung suburbs (Lasley, 2017; Myers, 2016; National Association of Realtors, 2017; Nelson, 2011). And Lee’s (2020) analysis of nearly four decades of U.S. Census data shows that a greater share of millennials actually live in urban cores (within a one-mile radius of major city centers) between ages 25 and 34 than did the preceding three generations. Blumenberg et al. (2019) also found that young American adults (ages 20-34) are more likely than older adults to live in urban areas (using the authors’ seven neighborhood type classifications and 2011-2015 five-year American Community Survey data). And Raymond et al. (2018) found using individual credit reports data that millennials are more likely to purchase their first home near a city center than those in the preceding generation (Generation X).

Yet Lee (2020) found that the vast majority of millennials at all ages still live 10 or more miles outside the main city center in the 50 largest U.S. metropolitan areas (81.77%). Blumenberg et al. (2019) likewise found that 69% of millennials live in suburban or rural neighborhoods. In addition, some studies indicate that millennials’ relatively greater concentration in and around urban cores results largely from a delay in the housing life cycle vis-à-vis previous generations – a delay in key events like marrying, having children, becoming financially independent, and buying their first home, due in part to the job and housing market collapses following the Great Recession (Lee, 2020; Myers, 2016). That is consistent with the

results from a 2017 national survey by the National Association of Realtors (2017), which suggest that millennials increasingly prefer “conventional suburban communities” as they have children and those children reach school age. These studies indicate that suburban populations will continue to grow – even many of the millennials who currently live near urban cores could eventually decamp to the suburbs when they get married, have children, or simply achieve sufficient financial stability to purchase a home (Lee, 2020; Myers, 2016).

That raises big questions for urban planners and policymakers, as well as for the future of sustainable urbanism: If most millennials will end up suburbanizing, what happens to their erstwhile preferences for walkability, accessibility, and transportation alternatives? Do they persist in the housing search process? And how do millennial households balance any such urban preferences against other household needs, dreams, or expectations? Overall, how do millennials choose where to live when they reach the life cycle stages typically associated with bigger homes in suburban areas?

These questions are not easily answered with stated preference surveys or statistical analyses of demographic data. Winstanley et al. (2002, p. 818) discuss the different approaches to studying residential mobility and conclude that regression models using survey data are unable to “incorporate the multiplicity and complexity” of factors in the decisionmaking process and leave unanswered “how households experience and make choices about their housing options.” Simply put, “[w]e need qualitative explorations of the processes by which households decide where to live and the formation of their preferences for different types of residential environments” (Handy, 2017, p. 28).

Salon and Kats (2020) recently used semi-structured interviews to explore the residential choice processes of 46 recent homebuyers in Phoenix, Arizona metropolitan region. The study

did not focus on millennials, but about half of the interviewees were millennial-aged. The authors focused on the role of transportation-related factors in the decision-making process. Across the 46 households, they found that proximity to work and other key destinations was a major factor in a majority of the households' residential choice process. However, from their in-depth interviewees with 12 of the participant households, they found that only a small minority prioritized access to transportation alternatives besides their private vehicles. But the authors conclude that this could be caused by the region's "prevailing culture of car dependence" and limited information about multimodal options, rather than the households' actual preferences (Salon & Kats, 2020, p. 1).

Beyond Salon and Kats' study and assorted news articles in the popular media, I found no studies that used in-depth interviews to explore millennials' residential location decision-making and trajectories, let alone how their neighborhood preferences might be changing and how they balance those preferences against their other household needs, dreams, or expectations. This study helps fill that gap.

4.4 EXPLORING MILLENNIAL RESIDENTIAL LOCATION CHOICE

I use in-depth interviews of 20 millennial households in the San Francisco Bay Area to explore how millennials choose where to live when they reach the life cycle stages typically associated with bigger homes in suburban areas. This article focuses on two themes that emerged from the interviews: life course effects on location choice and the continuing importance of transportation for suburbanizing households.

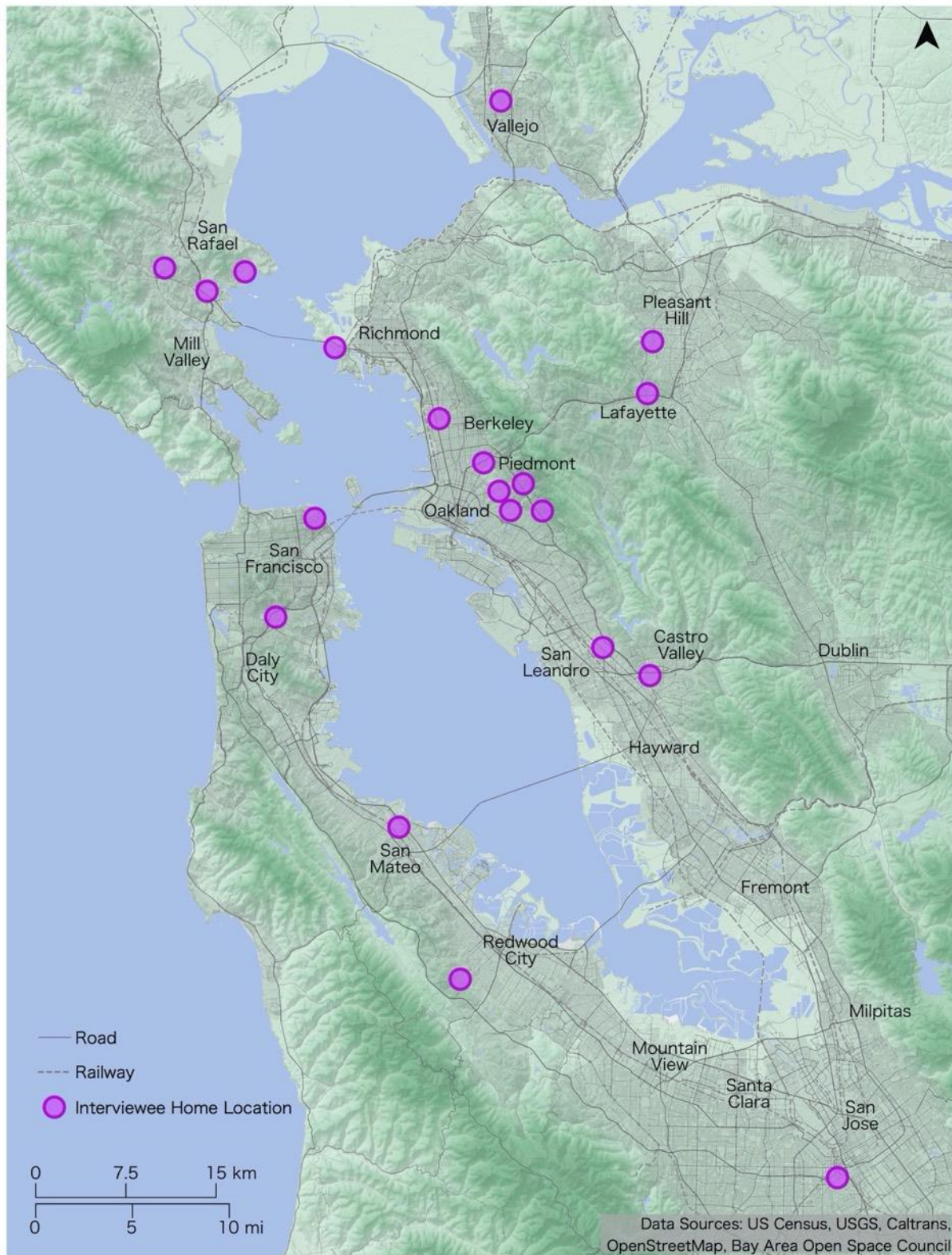
4.4.1 Study Setting

The San Francisco Bay Area is a popular region amongst millennials and a natural setting for this study. The San Jose-San Francisco-Oakland combined statistical area had more than 2,100,000 millennial residents as of 2018, when I began the participant interviews (U.S. Census Bureau, 2018a). It also had a greater share of millennials (24.0%) than the United States as a whole (23.2%) (U.S. Census Bureau, 2018a). And it remains a destination spot for migrating millennials (Anderson, 2019; Frey, 2018). With a large and increasing millennial population in the Bay Area, it is useful for planners and policymakers there to better understand millennials' residential location choices.

The Bay Area also has a broad mix of available housing types and residential neighborhoods – ranging from urban cores to exurbs – within commute range of the same job centers. That wide array of options makes the Bay Area an ideal place for exploring how millennials' preferences for neighborhood types and qualities affect their housing search processes. The region's high home prices can limit actual neighborhood choice, but most millennial residents are at least likely to be familiar with the range of neighborhood types.

Figure 4.1 shows the approximate residential locations of the 20 interviewee households within the Bay Area region. It also shows the extensive roadway and railway networks that connect the region and enable people to live in farther flung and largely suburban communities like Lafayette, San Rafael, and Pleasant Hill while still working in job centers in larger cities like San Francisco, San Jose, and Oakland.

FIGURE 4.1 – Locations of Study Participants' Homes in the San Francisco Bay Area



4.4.2 Participant Recruitment and Snapshot

I used the following four participant criteria for the household interviews. The criteria were designed to select millennial households who, prior to their most recent residential move, had reached the life cycle stages typically associated with bigger homes in suburban areas. That way I could more effectively explore how the households balanced any urban preferences commonly reported by millennials against other household needs, dreams, or expectations.

First, each household needed to have at least one millennial decision-maker. I used the U.S. Census Bureau's definition of millennials: people born between 1982 and 2000 (U.S. Census Bureau, 2015).

Second, the household decision-makers needed to be married or engaged to be married, which is one of the life cycle stages often associated with transitioning to bigger homes in suburban neighborhoods (Lee, 2020; Myers, 2016; Varady, 1990a; Zillow Group, 2016). I also prioritized households with children or children on the way, since that is another life cycle stage associated with increased preference for and moves to large-lot single-family houses (Kim et al., 2005; Liao et al., 2015; Myers, 2016; Varady, 1990a; Zillow Group, 2016).

Third, the households needed to be homeowners, and ideally first-time homeowners. The choice to buy a home, like marriage and having children, is correlated with choosing single-family detached homes in more suburban neighborhoods (Drew & Herbert, 2013). I also targeted homeowners instead of renters because homeowners have a longer average post-move tenure in their neighborhood, thus creating longer-lasting effects from their residential location choices (McCabe, 2016; U.S. Census Bureau, 2018a).

Fourth, I prioritized households that recently moved into their home (ideally within one year prior to the interview). I targeted households that recently moved because they would likely

be better able to remember and articulate the reasons behind their residential location choice and the decision-making process preceding it.

I recruited households meeting those criteria using convenience and snowball sampling. First, I invited a convenience sample of personal acquaintances to be interviewed (n = 4 households). Second, I was introduced through separate personal connections to another five households meeting my criteria. Third, all of the initial nine households I interviewed introduced me to at least one additional household meeting my selection criteria, which is how I recruited the final 11 household interviewees. All households outside of the four-household convenience sample were offered a \$100 pre-paid debit card for participating.

Table 4.1 shows the demographic characteristics, current housing characteristics, and previous housing types of the interviewees (at the time of their interviews).

TABLE 4.1 – Demographics and Housing Characteristics of Interviewees

Current Housing Type (n = 20)	
<i>Single-family detached</i>	17
<i>Townhouse</i>	1
<i>Condominium in multi-unit building</i>	2
Housing Type of Most Recent Previous Home (n = 40)^a	
<i>Single-family detached</i>	7
<i>Townhouse</i>	2
<i>Apartment or condominium in multi-unit building</i>	26
<i>Other (e.g. accessory dwelling unit)</i>	5
Median Home Prices	
<i>Interviewee household sample (n = 20; median interval)</i>	\$1,000,000 - \$1,099,999
<i>San Jose-San Francisco-Oakland combined statistical area (2018)^b</i>	\$835,100
Household Demographics (n = 20)	
<i>Share with children or have a child on the way</i>	60%
<i>Share married or engaged</i>	100%
<i>Share first-time homebuyers</i>	90%
<i>Share who moved within one year before interview^c</i>	75%
Individual Demographics (n = 40)	
<i>Average age</i>	33
<i>Age range^d</i>	29-43
<i>Share non-Hispanic white^e</i>	72.5%

Notes:

a. Not all household partners lived together prior to purchasing a home together, so their previous housing types are tallied separately.

b. Source: U.S. Census Bureau (2018).

c. Only five households had moved more than one year prior to the interview. And all five had moved within three years prior to the interview.

d. 38 of the 40 household partners were millennials. The two non-millennial partners, one from Household 12 and one from Household 16, were part of the next oldest generation (Generation X). They were 39 and 43 at the time of the interviews

e. Overall racial and ethnic composition (n = 40): 29 non-Hispanic white; on Hispanic; nine Asian; one Middle Eastern.

4.4.3 The Interview Process and Analysis

I conducted the 20 interviews between May 2018 and February 2019. I interviewed 18 of the 20 households at their homes and the other two at coffee shops. I was able to speak with both decision-makers in 17 of the 20 households. And most interviews lasted between one and two hours. I recorded all interviews anonymously and later had the recordings transcribed by Rev's

online transcription service. The interview protocol was reviewed and approved by the University of California, Davis Institutional Review Board Administration

I used a semi-structured approach in the interviews. I started with the same introductory script (Appendix B) in each interview. But I tried to be as hands off as possible and just let the interviewees “take me through their home search journeys.” I prompted interviewees to discuss following four topics if they did not cover them organically:

1. Why and whence they moved (from what region, neighborhood type, and house type);
2. How and why they decided to move to their current home (to the region, the neighborhood, and the house), including the top five “most important factors” in their residential location choice;
3. Whether they like their current home and neighborhood; and
4. Where they see themselves in 10 years.

The specific sub-questions within each topic are listed in Appendix B.

After each interview, I asked both household decision-makers to complete an online survey with basic questions about their demographics and homes (both current and previous). Over 75% completed the survey. A copy of the survey is attached as Appendix C.

I used an inductive approach to analyzing the interview data. I first categorized each household’s level of suburbanization. I used the interviewees’ own descriptions of their current and former homes, and for each pair of homes I also calculated the approximate change in distance to an urban core (defined as the city hall of the three most populous cities in the San Jose-San Francisco-Oakland combined statistical area – San Jose, San Francisco, and Oakland). I categorized each household as either having suburbanized (moved further from an urban core),

moved to an equally suburban neighborhood, or moved to an equally or more urban neighborhood. I then reviewed the interview transcripts for recurring themes in how households chose where to live, particularly in how they balanced their preferences, needs, dreams, and expectations. I discuss two themes in this article: life course effects on location choice and the continuing importance of transportation for suburbanizing households.

4.4.4 Limitations

This study is exploratory. And as with many interview-based studies in the housing literature, my household sample is relatively small ($n = 20$) and not randomly selected (Næss, Peters, Stefansdottir, & Strand, 2018; Reid, 2013; Salon & Kats, 2020; Winstanley et al., 2002). The results are thus not necessarily generalizable either within the Bay Area or to millennials more broadly. Future research should explore the themes discussed below in other geographies (e.g. regions with lower home prices) and amongst different millennial demographics (e.g. lower-income households and more non-white households).

4.5 RESULTS AND DISCUSSION

The interviews revealed two major themes that shed light on what the millennial residential location process and trajectory might look like.

4.5.1 Family Life Cycle Effects Emerge in Different Ways

By design, all 20 of the households I interviewed were homebuyers, and most (18 of 20) were first-time homebuyers (Table 4.1). In addition, all interviewees were couples that were either married or engaged to be married. Most households (12 of 20) also had young children or a child

on the way. Theory and evidence both suggest that these three life course events are associated with a transition to bigger homes with more outdoor space in suburban areas (Drew & Herbert, 2013; Kim et al., 2005; Knox & Pinch, 2010; Lee, 2020; Liao et al., 2015; National Association of Realtors, 2017; Varady, 1990a; Zillow Group, 2016). Despite their putatively greater preference for urban amenities than previous generations, evidence suggests that millennials will likewise suburbanize at those life cycle stages (Blumenberg et al., 2019; Lee, 2020; Myers, 2016; National Association of Realtors, 2017). The stories told by the households I interviewed illuminate that trajectory.

Not every household suburbanized. Two of the 20 households moved laterally from one suburban neighborhood to another. For example, Household 13 purchased a single-family detached house in the same neighborhood in the Oakland hills where they had been living in an accessory dwelling unit. And on the other end of the spectrum, six households bought a home in an equally or more urban neighborhood. For example, Household 9 moved from an apartment southwest of San Francisco's city hall to a condominium in the Russian Hill neighborhood. And Household 15 purchased a single-family house just a half mile from the apartment they had been renting in Berkeley, both less than ½ mile from the North Berkeley Bay Area Rapid Transit (BART) station.

But most interviewees moved from a smaller unit in a denser urban area to a bigger home farther from an urban core. For example, Household 10 moved from an accessory dwelling unit in Oakland's Rockridge neighborhood to a single-family home in San Leandro, 10 miles to the southeast. Household 16 bought a single-family home in Vallejo after renting a studio apartment near Lake Merritt in Oakland. And Household 14 moved from a two-bedroom apartment adjacent to Lake Merritt to a three-bedroom house in the Oakland hills.

But as Table 4.2 shows, suburbanization was not always the first choice of the households that moved farther from urban cores.

TABLE 4.2 – Neighborhood Trajectories of Interviewed Households

	Total	Originally Wanted to Buy in an Urban Neighborhood	Will Suburbanize (or Suburbanize Further) in the Future
<i>Households That Suburbanized</i>	12	5	6
<i>Households That Moved to Another Suburban Neighborhood</i>	2	0	1
<i>Households That Moved to an Equally or More Urban Neighborhood</i>	6	6	4
Total	20	11	11

Five of the 12 households that suburbanized would have preferred to buy a home in a more urban neighborhood and started their search processes there. For example, Household 19’s “idea was to stay in Oakland” until they “started realizing [they] couldn’t do that” financially. Household 1 similarly “want[ed] to originally stay in Oakland, Berkeley” to “keep elements” of “urban life,” but ultimately moved to suburban Pleasant Hill. As one of Household 1’s partners put it:

As we started doing more research, seeing how homes were selling, we actually started getting input from agents that we might have to consider more of the burbs of Oakland. And then at that point it was . . . taking away reasons why we wanted, we were considering Oakland and Berkeley to begin with. So . . . we then decided, well, if we’re only going to be able to afford the suburbs of Oakland, well why not just move to the actual suburbs?

The fact that over 40% of suburbanizing households wanted to remain closer to an urban core but could not afford a home meeting their criteria highlights how essential increased housing production is meeting millennial demand for urban living (Lee, 2020). While urban areas often have limited land available for building new single-family homes, urban

condominiums could also attract millennials. For example, Household 2 told me that they “probably would have” stayed in San Francisco if they had “found a decent condo that was big enough.” They could not, and they ultimately decamped to suburban San Rafael.

However, it is also possible that even if those four households had purchased a more centrally located home they would still have suburbanized a few years later. Indeed, three of the households projected that they would likely have suburbanized within five or so years even if they had found a suitable home closer to an urban core. And another household – Household 4 – had actually owned and lived in a condominium in San Francisco for six years prior to purchasing their single-family home in San Rafael.

All five households wanted to keep the perks of urban living for a few years longer if possible –commonly listed amenities included walkability, easy access to transit options, diversity, and proximity to and variety of shops, restaurants, bars, and other activities. But at the same time, they all expected they would “outgrow” the homes they could afford closer to an urban core, as they had children or their children aged. Four of the households also noted how they would probably want to move to better school districts as their children aged. Some of the interviewees also mentioned simply “outgrowing” city life and tiring of the less glamorous aspects of urban living. As one of Household 4’s partners put it:

I think things were starting getting annoying, . . . just congestion and noise, and um, San Francisco.

The other partner agreed: “We heard sirens all the time.” And they started to realize “how much trash was on the street” when their dogs kept “trying to get into it.” In a similar vein, Household 1 vividly recounted the “city smell.” One interviewee also admitted that the homelessness in San Francisco made him uncomfortable.

These themes actually pervaded many of the 20 households' stories, either as reasons for having suburbanized in the first place and/or as reasons for moving farther from urban cores in the future (which 11 of the 20 households expected to do, including seven households that had already suburbanized). The two most frequently cited reasons were obtaining additional space (usually with a growing family in mind) or accessing better public schools (especially middle and high schools). Of the 17 households that had either already suburbanized and/or expected to move farther from urban cores in the future, 16 listed wanting more house or lot space as a key rationale and seven mentioned accessing better school districts. Household 1 encapsulated both issues in describing their motivations for choosing to buy a house in suburban neighborhood of Pleasant Hill instead of in a more urban neighborhood in Oakland or Berkeley:

So I think our thought too was when we define starter home, you know like maybe we could have the first kid [in Oakland or Berkeley] and then by the time like school districts are gonna really come into play more than maybe we could revisit the idea um, we could have stayed but I think there's also a heavy chance that we would move, move more inland um, for more space, better school districts, all that kind of stuff.

Household 2 illustrated how the space demands of preparing for their first child unexpectedly crept up on them and motivated them to consider buying a bigger house in five to 10 years:

Yeah. It's like, it's strange how that happens, but like we, we came from an apartment, so we were thinking okay, we're going to like a three-bedroom house. That's like a big change. But it just fills up quickly, and I mean, well now one room's a baby room, so that's like completely occupied by baby stuff.

In addition to wanting more space or better school districts, half of the 12 suburbanizing households also mentioned either that urban life was losing its luster or that they had simply reached that stage in their lives when they had envisioned suburbanizing. One of the partners in Household 11 explained that while "I liked the restaurants and the bars and kind of the vibe of

being in the city here. I think that ... I, I find myself going out less often than I used to also.”

Household 4 similarly articulated the fading allure of city life:

As we [got] older, I think, you know, going out to bars and stuff. We definitely still went out to eat at time, but like the nightlife element of living in the city was less appealing to us, and so just kind of that over time got us to a point where we wanted to move.

Beyond just growing tired of urban life, one partner in Household 2 described an almost engrained magnetism to return to the suburban area in which she grew up: “And then thinking in the suburbs . . . Maybe not even intentionally, but we were just thinking more long-term.” “I think I had envisioned coming back,” she said. A partner from Household 3, which likewise moved to suburban San Rafael, noted a similar experience: “[I] always knew I wanted to come back to Marin” County.

More broadly, at least one partner in most of the 20 households noted growing up with some perception or even outright familial expectation that they would suburbanize or at least own a home. Their stories evoked notions of the American Dream, which has long been tied to homeownership and, at least since World War II, suburbanization (McCabe, 2016). One of Household 8’s partners described “kn[owing] from a very young age that she wanted to save and buy a house someday” because homeownership was imbued in her familial ethos:

I think it was really like the American dream s- scenario-like you come to America, you don't have anything . . . and, um, I think that is just a dream, you've come to America, and you own your own . . . house with a car and a yard.

Overall, the stories told by the 20 households I interviewed indicate that life cycle effects were real for them, but emerged in different ways. As they partnered and began having or thinking about having children, most households sought more space and many sought better school districts. To obtain those amenities, most households either suburbanized or plan to suburbanize in the future, which is consistent with the trajectories indicated by the National

Association of Realtors' (2017) survey and Myers' (2016) prediction. A number of those households were also just ready for a change of pace, one that some interviewees had long envisioned based on the milieu they grew up with.

4.5.2 The Continuing Importance of Transportation for Suburbanizing Households

If most millennials will end up suburbanizing, what happens to their erstwhile preferences for walkability, accessibility, and transportation alternatives? The suburbanizing households I interviewed could not have it all. As Household 1 put it: “we weren’t going to get everything we wanted.” All 12 households compromised to some degree, no matter how long they looked or how much they paid for their home. And urban amenities were often part of the sacrifice, with one exception – proximity to commuter transit.

All 12 suburbanizing households described having lived in urban areas and valuing a range of urban amenities, like walkability, transit access and transportation alternatives, diversity, and proximity to and variety of shops, restaurants, bars, and other activities. And as discussed in the previous section, five of those households originally sought to buy a home in a similarly urban neighborhood to where they had been living, before realizing they could not afford a home meeting their criteria. But once the households started looking for more suburban homes, most of their urban preferences did not rank highly in their search criteria. In fact, numerous households acknowledged that they were effectively “trading [away] our life in the city,” as one of Household 12’s partners put it.

The one urban-type amenity that the suburbanizing households almost uniformly prioritized was access to transit for commuting. Ten of the 12 suburbanizing households reported including access to transit in their top search criteria, while only four households included

another urban-type amenity (walkability for three households, and walkability plus proximity to shops and restaurants for the fourth). Eight households actually restricted their suburban search options to areas closer to commuter transit, including BART (3 households), a transbay ferry connecting the San Rafael area to San Francisco (3 households), a transbay bus (1 household), and commuter rail system (Caltrain) connecting the San Francisco Peninsula and the Santa Clara Valley to the south (1 household). In addition, at least one partner in another three households reported that they still regularly commuted by transit after suburbanizing (though that often required driving to the station). The interviewees who used transit and prioritized it in their home-buying search were keen on avoiding the hassle of driving and saving money on their work commutes.

As one partner in Household 1 bluntly stated: “that would be a no go . . . if our only option was to drive.” Her partner further explained: “I mean if we were thinking about commute, we were already adding to the distance of the commute so we didn’t want to be like you know, 20 minutes to BART.” They ended up buying a house just a short drive away from a BART station. And both partners continue to commute to San Francisco on the train, though they now drive to the station instead of walking, as they did when they lived in an apartment in Oakland.

Households 11 and 18 were more explicit about the strain of commuting by car in the notoriously congested Bay Area. One of Household 18’s partners commutes from the Oakland hills to San Francisco by bus. He explained their decision to buy a house near the transbay bus line as the product of both the high cost: “I would never actually drive my own car, though; it’s like 700-dollar parking at my [work] place. I hate driving, and traffic without a carpool is terrible.” Household 11 similarly reasoned that “traffic was getting so bad in the Bay Area that we would do what we could to take public transit.” And commuting by car had simply become

untenable for one of Household 11's partners: "I would get this like, like visible headache, every day, driving home from work. And it's because you're like, on the brakes the whole time."

Overall, access to commuter transit was the urban amenity most valued by the suburbanizing households in choosing where to buy a home. The widespread importance of transit access highlights the "inextricable link" between land use and transportation (Handy, 2005), as well as the potential for millennials to age and suburbanize without increasing their driving as substantially as previous generations (Wang & Akar, 2020). Salon and Kats (2020, p. 19) similarly conclude from their study of mostly millennial-aged households in the Phoenix, Arizona region that the "[h]omebuyers we interviewed convincingly claimed that they would be happy to make more sustainable transportation choices if they were available in their neighborhoods."

Of course, being able to buy a home near a commuter transit stop of course presupposes that the region has those transit services available. And prospective buyers must also know that the services exist. The households I interviewed knew their transit options well and prioritized their home searches accordingly, but that will not always be the case. Salon and Kats (2020, p. 19) found that most of the households they interviewed "did not seem to take [the available transit] services into consideration when choosing their homes." As Salon and Kats note, that highlights a role for realtors in regions that already have well-appointed regional transit system – informing homebuyers of the options available at the outset of the home search process could help them make a more satisfying residential location choice. As Rodriguez and Rogers conclude from a study of university students, "providing [bundled] information on location choices and travel behaviors ... appears to be a promising strategy for influencing location decisions and prompting travel behavior change."

However, as the stories told in my interviews illustrate, commuter transit services must also be relatively cheap and/or convenient for households to use transit instead of driving. Households in regions with less traffic than the Bay Area, for example, might find transit less convenient than driving. The availability of autonomous vehicles could change the attractiveness of transit calculus, even in the Bay Area. Two households told me they would consider moving even farther away from an urban core and lengthening their commutes because, as one of Household 6's partners put it, "self-driving cars would make commutes . . . enjoyable." In addition, millennials' preference for transit access could very well subside in the wake of the COVID-19 pandemic.

4.6 CONCLUSION

The stories told by the 20 millennial households I interviewed indicate that life cycle effects were real for them, but emerged in different ways. As they partnered and began having or thinking about having children, most households sought to purchase homes with more space. Many also sought better school districts. And some just felt it was time to take the "next step" along the residential path they had envisioned for themselves or been conditioned to expect by their families or society. That led most households to either suburbanize or plan to suburbanize in the future. Even four of the six households who bought a home in a relatively urban neighborhood indicated they would likely move farther from urban cores in five to 10 years.

That does not mean the households did not value urban amenities. They did, which is consistent with survey-based evidence that millennials are more likely than previous generations to prefer urban amenities like walkability, transportation alternatives, and proximity to a variety of shops, restaurants, and other activities (Lasley, 2017; Myers, 2016; National Association of

Realtors, 2017; Nelson, 2011). Indeed, all 12 suburbanizing households I interviewed reported having enjoyed city life and its amenities. And five even looked for relatively urban homes first, and might have purchased there if the market were not so expensive and competitive. But households generally did not prioritize urban amenities when searching for their suburban homes, with one exception – proximity to commuter transit. Ten of the 12 suburbanizing households reported including access to transit in their top search criteria, and eight households actually restricted their suburban search options to areas closer to commuter transit. These findings highlight the potential for millennials to age and suburbanize without increasing their driving as substantially as previous generations (Wang & Akar, 2020). However, millennials' preference for transit access could very well subside in the wake of the COVID-19 pandemic and if autonomous vehicles become widely available.

Future research should explore the themes discussed in this article in other geographies (e.g. regions with lower home prices) and amongst different millennial demographics (e.g. lower-income households and more non-white households).

5. CONCLUSION

I explored three questions in this dissertation: (1) whether governmental policies will go far enough to enable a significant increase in housing development in lower-VMT urban areas, (2) whether existing homeowners will accept densification of single-family neighborhoods, and (3) whether prospective homebuyers – especially millennials – want to live in the prototypical suburb of the American Dream or something more urban.

In my first study, my co-authors and I used a historical counterfactual approach to assess how replacing LOS with VMT could have impacted the approval process for 153 land development projects over 16 years in the City of Los Angeles. We found no evidence that switching to VMT could have reduced litigation against the projects. But we did find that nearly 63 percent of the studied projects could have benefited from at least some CEQA streamlining under the state's suggested VMT-based framework, including over 75 percent of residential-containing projects. That means nearly 40,000 residential units – 28 percent of Los Angeles' total housing production over the 16-year study period – potentially could have been streamlined through environmental review. Our results suggest that switching to VMT could reduce the environmental review burden for urban development and provide at least some of the approval process streamlining commonly regarded as necessary to increase housing production in California (Reid et al., 2017; Stahl, 2018; Taylor, 2015). And because the streamlined development would be in areas characterized by lower VMT per capita than the regional average, it would likely contribute to reducing VMT per capita in line with state targets (California Air Resources Board, 2018).

In my second study, I used a survey of 502 single-family homeowners in the Sacramento metropolitan area to investigate homeowners' willingness to consider building an ADU, and the

motivations and barriers they face. My findings indicate that there is substantial homeowner interest in creating an ADU. As many as 54.1% of Sacramento city single-family detached homeowners either have an ADU or are open to creating one. And ADUs could interest even more homeowners with sustained educational outreach by local governments or civil society organizations – I found that familiarity with ADUs has the strongest association with openness to building an ADU out of all the predictor variables in my regression model. In addition, a sizeable minority of respondents’ rationales for not wanting an ADU are logistical and potentially obviated by zoning reform and other measures to facilitate ADU construction. However, most rationales are driven by less mutable personal preferences.

Of course, being open to building an ADU is not the same as actually creating one. And barriers to ADU production remain. Cost-related concerns ranked as the biggest obstacles to creating an ADU, followed by permitting and regulatory issues. In California, the state’s relaxation of ADU regulations should reduce many of regulatory barriers, as well as some of the permitting- and cost-related barriers. And as a result, ADUs have significant potential to help California close its housing supply gap. Similar results could potentially also occur from similar actions in jurisdictions outside of California. But construction costs and obtaining financing will likely continue to be major impediments to widespread ADU production without changes in lending practices. There is also a need for programs to provide ADU funding assistance to lower-income households, which are disproportionately burdened by cost and financing barriers.

In my third study, I used in-depth interviews of 20 households in the San Francisco Bay Area to explore how millennials choose where to live when they reach the life cycle stages typically associated with bigger homes in suburban areas. The stories told by the 20 millennial households I interviewed indicate that life cycle effects were real for them, but emerged in

different ways. As they partnered and began having or thinking about having children, most households sought to purchase homes with more space. Many also sought better school districts. And some just felt it was time to take the “next step” along the residential path they had envisioned for themselves or been conditioned to expect by their families or society. That led most households to either suburbanize or plan to suburbanize in the future. Even four of the six households who bought a home in a relatively urban neighborhood indicated they would likely move farther from urban cores in five to 10 years.

That does not mean the households did not value urban amenities. They did, which is consistent with survey-based evidence that millennials are more likely than previous generations to prefer urban amenities like walkability, transportation alternatives, and proximity to a variety of shops, restaurants, and other activities (National Association of Realtors, 2017; Myers, 2016; Lasley, 2017; Nelson, 2011). Indeed, all 12 suburbanizing households I interviewed reported having enjoyed city life and its amenities. And five even looked for relatively urban homes first, and might have purchased there if the market were not so expensive and competitive. But households generally did not prioritize urban amenities when searching for their suburban homes, with one exception – proximity to commuter transit. Ten of the 12 suburbanizing households reported including access to transit in their top search criteria, and eight households actually restricted their suburban search options to areas closer to commuter transit. These findings highlight the potential for millennials to age and suburbanize without increasing their driving as substantially as previous generations (Wang & Akar, 2020). However, millennials’ preference for transit access could very well subside in the wake of the COVID-19 pandemic and if autonomous vehicles become widely available.

Future research should follow up on all three studies. For Study 1, future research will be needed to assess how the LOS-to-VMT switch ultimately affects development, congestion, and VMT in California. Regular statewide surveys are also needed to assess how CEQA is affecting development, including the type and costs of CEQA-related mitigation measures. For Study 2, future research is needed to explore the income inequality of access to permitted ADUs for both homeowners and renters. Scholars should also continue investigating how California's regulatory relaxations affect ADU production and homeowner interest in ADUs. For Study 3, researchers should examine the importance of urban preferences – and commuter transit access in particular – to millennial homebuyers in other geographies and amongst different millennial demographics (e.g. lower-income households and more non-white households).

REFERENCES

- Alterman, R., & Calor, I. (2020). Between informal and illegal in the Global North: Planning law, enforcement and justified non-compliance. *Comparative Approaches to Informal Housing Around the Globe*, 1–30.
- Anacker, K. B., & Niedt, C. (2019). Classifying Regulatory Approaches of Jurisdictions for Accessory Dwelling Units: The Case of Long Island. *Journal of Planning Education and Research*. <https://doi.org/10.1177/0739456X19856068>
- Andersen, M. (2019). A Portland ADU Program Pairs Lower-Wealth Homeowners and Low-Income Tenants. *Sightline Institute*.
- Anderson, T. (2019). Where Are Millennials Moving. *Haven Life Blog*.
- Antoninetti, M. (2008). The difficult history of ancillary units: The obstacles and potential opportunities to increase the heterogeneity of neighborhoods and the flexibility of households in the United States. *Journal of Housing for the Elderly*, 22(4), 348–375. <https://doi.org/10.1080/02763890802458320>
- Arnold, J., Graesch, A., Ragazzini, E., & Ochs, E. (2012). *Life at Home in the Twenty-First Century: 32 Families Open Their Doors*. Los Angeles: Cotsen Institute of Archaeology Press.
- Arrington, G. B., & Cervero, R. (2008). *Effects of TOD on Housing , Parking , and Travel*.
- Baigent, W. (2019). *Switching Lanes: The Potential of Laneway Housing in Reducing Greenhouse Gas Emissions in Toronto, Canada*.
- Barbour, E. (2015). *Regional Sustainability Planning by Metropolitan Planning Organizations* (Doctoral dissertation). University of California, Berkeley.
- Barbour, E., & Deakin, E. (2012). Smart Growth Planning for Climate Protection. *Journal of the American Planning Association*, 78(1), 70-86. <https://doi.org/10.1080/01944363.2011.645272>
- Barbour, E., & Teitz, M. (2005, April 6). *CEQA Reform: Issues and Options* (background report for the CEQA Improvement Advisory Group). San Francisco California: Public Policy Institute of California.
- Battaglia, M. P., Hoaglin, D. C., & Frankel, M. R. (2009). Practical Considerations in Raking Survey Data. *Survey Practice*, 2(5), 1–10. <https://doi.org/10.29115/sp-2009-0019>
- Been, V. (2005). Impact Fees and Housing Affordability. *Cityscape: A Journal of Policy Development and Research*, 8(1), 139-185.
- Been, V., & Infranca, J. (2014). *Responding to Changing Households: Regulatory Challenges for Micro-Units and Accessory Dwelling Units*.
- Bertolet, D., & Gabobe, N. (2019). LA ADU Story: How a State Law Sent Granny Flats Off the Charts: California's Successful ADU Reform Offers a Lesson for Washington on Balancing Local and State Control of Land Use. *Sightline Institute*. Retrieved from <https://www.sightline.org/2019/04/05/la-adu-story-how-a-state-law-sent-granny-flats-off-the-charts/>
- Blumenberg, E., Brown, A., Ralph, K., Taylor, B. D., & Turley Voulgaris, C. (2019). A Resurgence in Urban Living? Trends in Residential Location Patterns of Young and Older Adults Since 2000. *Urban Geography*, 40(9), 1375–1397. <https://doi.org/10.1080/02723638.2019.1597594>
- Brown, A., Mukhija, V., Shoup, D., Fischel, W., & Rules, Z. (2017). Converting Garages into Housing. *Journal of Planning Education and Research*. <https://doi.org/10.1177/0739456X17741965>

- Brown, B. B., & Cropper, V. L. (2001). New urban and standard suburban subdivisions: Evaluating psychological and social goals. *Journal of the American Planning Association*, 67(4), 402–419. <https://doi.org/10.1080/01944360108976249>
- Brown, J., & Watkins, T. (2012). Understanding and Appraising Properties with Accessory Dwelling Units. *The Appraisal Journal*, Fall, 297–309.
- Brown, M. J., & Palmeri, J. (2014). *Accessory dwelling units in Portland, Oregon: evaluation and interpretation of a survey of ADU owners*.
- Burge, G. S., Nelson, A. C., & Matthews, J. (2007). Effects of Proportionate-share Impact Fees. *Housing Policy Debate*, 18(4), 679-710. <https://doi.org/10.1080/10511482.2007.9521618>
- Busch, B. C., Lew, E., & Distefano, J. (2015). *Moving California Forward: How Smart Growth Can Help California Reach Its 2030 Climate Target While Creating Economic and Environmental Co-Benefits*.
- California Air Resources Board. (2016). *Potential State-Level Strategies to Advance Sustainable , Equitable Communities and Reduce Vehicle Miles of Travel (VMT) -- for Discussion*.
- California Air Resources Board. (2018). SB 375 Regional Greenhouse Gas Emissions Reduction Targets.
- California Air Resources Board. (2019). *California Greenhouse Gas Emissions for 2000 to 2017: Trends of Emissions and Other Indicators*.
- California Assembly Bill 1866 (2001-2002).
- California Assembly Bill 2299 (2015-2016).
- California Assembly Bill 2406 (2015-2016).
- California Association of Realtors. (2018). *Third Quarter Housing Affordability*. Retrieved from <https://www.car.org/aboutus/mediacenter/newsreleases/2018releases/3rdqtrhousingaffordability>
- California Association of Realtors. (2019). Housing Group Sues City of Whittier for Violating State Garage Conversion Law. *Cision PR Newswire*. Retrieved from <https://www.prnewswire.com/news-releases/housing-group-sues-city-of-whittier-for-violating-state-garage-conversion-law-300916365.html>
- California Civil Code, Division 4, § 4751.
- California Code of Regulations, Title 14, Division 6, Chapter 3, § 15000 et seq. (CEQA Guidelines). [https://govt.westlaw.com/calregs/Browse/Home/California/CaliforniaCodeofRegulations?guid=I95DAAA70D48811DEBC02831C6D6C108E&originationContext=documenttoc&transitionType=Default&contextData=\(sc.Default\)](https://govt.westlaw.com/calregs/Browse/Home/California/CaliforniaCodeofRegulations?guid=I95DAAA70D48811DEBC02831C6D6C108E&originationContext=documenttoc&transitionType=Default&contextData=(sc.Default))
- California Department of Finance. (2019). *E-1 Population Estimates for Cities, Counties and the State with Annual Percent Change — January 1, 2018 and 2019*. Sacramento, CA.
- California Department of Housing and Community Development. (2018). *Accessory Dwelling Unit Memorandum*. Retrieved from <https://www.hcd.ca.gov/policy-research/docs/2016-12-12-ADU-TA-Memo.docx.pdf>
- California Department of Housing and Community Development. (2018). *California's Housing Future: Challenges and Opportunities - Final Statewide Housing Assessment 2025*. Retrieved from http://www.hcd.ca.gov/policy-research/plans-reports/docs/SHA_Final_Combined.pdf
- California Department of Justice. (2012). *Quantifying the Rate of Litigation under the California Environmental Quality Act (CEQA): A Case Study*.

- California Government Code, Division 1, § 65852.2.
- California Health and Safety Code, Division 13, § 17980.12.
- California Housing Finance Agency. (2017). Homeownership Program Bulletin.
- California Housing Partnership. (2020). Affordable Housing Needs Report.
- California Housing Partnership Corporation. (2016, April). *Confronting California's Rent and Poverty Crisis: A Call for State Reinvestment in Affordable Homes*. San Francisco, California: California Housing Partnership. Retrieved from <http://chpc.net/wp-content/uploads/2016/04/State-Housing-Need-2016.pdf>
- California Natural Resources Agency. (2019). *CEQA: The California Environmental Quality Act*. Retrieved from <http://resources.ca.gov/ceqa/>
- California Public Resources Code, Division 13, § 21000 et seq.
<https://codes.findlaw.com/ca/public-resources-code/#!tid=N13BD5B5F2C35467A83716A19C28673F6>
- California Senate Bill 35 (2017-2018), Chapter 366 (Cal. Stat. 2017). Retrieved from https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB35
- California Senate Bill 50 (Wiener, 2018-2019). Retrieved from https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201920200SB50
- California Senate Bill 743 (2013-2014), Chapter 386 (Cal. Stat. 2013). Retrieved from https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140SB743
- California Senate Bill 827 (Wiener, 2017-2018). Retrieved from https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB827
- California Senate Bill 1069 (2015-2016).
- California Senate Bill 1534 (1981-1982).
- Caltrans. (2015). *VMT Analysis 2015_11_19*. Retrieved from <http://www.dot.ca.gov/hq/tpp/offices/omsp/SB743.html>
- Carlin, B. N. F., & Farabee, D. R. (2011). *CEQA Streamlining Legislation: Some Small Steps Forward, but No Giant Leap*. Retrieved from <https://www.pillsburylaw.com/print/content/21806/ceqa-streamlining-legislation-some-small-steps-forward-but-no.pdf>
- Casey, D. (2019a). How to Make Your Home a Triplex.
- Casey, D. (2019b). Keeping an Eye on Piedmont's ADU Gymnastics.
- Casey, D. (2019c). Making Sense of This Year's ADU Legislation.
- Casey, D. (2020). COVID-19 Stopped the Economy, but Our Housing Shortage Remains. CaRLA Continues to Fight for the Answer to Both: ADUs. Retrieved from <https://carlaef.org/2020/04/16/covid-19-stopped-the-economy-but-our-housing-shortage-remains-carla-continues-to-fight-for-the-answer-to-both-adus/>
- Cervero, R., & Hansen, M. (2002). Induced Travel Demand and Induced Road Investment: A Simultaneous Equation Analysis. *Journal of Transport Economics and Policy*, 36(3), 469-490.
- Chapman, N. J., & Howe, D. A. (2001). Accessory apartments: Are they a realistic alternative for ageing in place? *Housing Studies*, 16(5), 637-650.
<https://doi.org/10.1080/02673030120080099>
- Chapple, K., Lieberworth, A., Hernandez, E., Ganetsos, D., Alvarado, A., & Morgan, J. (2020). *The ADU Scorecard: Grading ADU Ordinances in California*.
- Chapple, K., Wegmann, J., Mashhood, F., & Coleman, R. (2017). *Jumpstarting the Market for Accessory Dwelling Units: Lessons Learned from Portland, Seattle and Vancouver*.

- Chapple, K., Wegmann, J., Nemirow, A., & Dentel-Post, C. (2012). *Yes in My Backyard: Mobilizing the Market for Secondary Units*.
- Cho, J. (2016). Second Units in the Silicon Valley. *The Urban Lawyer*, 48(3), 459–488.
- City News Service. (2019). San Diego County Offering Free, Pre-Approved Housing Plans for Granny Flats. *KPBS*.
- City of Oakland. (2016). Staff Report for September 21, 2016 Oakland City Planning Commission Hearing.
- City of Oakland. (2017). *Transportation Impact Review Guidelines*.
- City of Orange v. Valenti, 37 Cal.App.3d 240 (Cal. Ct. App. 4th Dist. 1974).
- City of Pasadena Department of Transportation. (2015). *Transportation Impact Analysis: Current Practice & Guidelines*.
- City of Sacramento City Planning and Development Code, Section 17.228.105.
- City of Sacramento City Planning and Development Code, Section 17.608.030.
- City of Sacramento. (2013). 2013-2021 Housing Element.
- City of Sacramento. (2020). Accessory Dwelling Units.
- City of San Jose. (2018). Transportation Analysis Policy. Retrieved from <http://www.vtpi.org/tdm/tdm129.htm>
- City of San Jose. (2020). Accessory Dwelling Units (ADUs).
- City of Sausalito Community Development Department. (2011). Accessory Dwelling Unit Survey Technical Report: Two-Family and Multi-Family Zoning Districts.
- Collier, A. (2018). Survey Raking: An Illustration.
- Congel, S., Clark, K., & Cizeau, M. (2019). *How Three Millennials Revolutionized a Global Industry*. Retrieved from <https://digitalcommons.bucknell.edu/cgi/viewcontent.cgi?article=1008&context=glbm400>
- Corso, S. (2019). Rent Growth for Sacramento Housing Remains High. *Mynd Blog*.
- Coulter, R., van Ham, M., & Findlay, A. M. (2016). Re-thinking Residential Mobility: Linking Lives through Time and Space. *Progress in Human Geography*, 40(3), 1–23. <https://doi.org/10.1177/0309132515575417>
- Debevec, K., Schewe, C., Madden, T., & Diamond, W. (2013). Are Today's Millennials Splintering into a New Generational Cohort? Maybe! *Journal of Consumer Behaviour*, 12, 20–31. <https://doi.org/10.1002/cb>
- DeRobertis, M., Eeels, J., Kott, J., & Lee, R. (2014). Changing the Paradigm of Traffic Impact Studies : How Typical Traffic Studies Inhibit Sustainable Transportation. *ITE Journal (Institute of Transportation Engineers)*, 84(5), 30–35.
- Diaz, H. (2019). *Bidding AD(ie)U to Homelessness*.
- Dillman, D. (2007). *Mail and Internet Sureys: The Tailored Design Method (Second)*. Wiley & Sons.
- Dillon, L. (2019a). How Lawmakers Are Upending the California Lifestyle to Fight a Housing Shortage. *Los Angeles Times*.
- Dillon, L. (2019b). Newsom Says He's Done a Good Job Fixing California's Housing Crisis. Facts Say Otherwise. *Los Angeles Times*.
- Dougherty, C. (2017). The Great American Single-Family Home Problem. *The New York Times*. Retrieved from https://www.nytimes.com/2017/12/01/business/economy/single-family-home.html?mwrs=Facebook&_r=5
- Dougherty, C. (2020). *Golden Gates: Fighting for Housing in America*. New York: Penguin Press.

- Drew, R. B., & Herbert, C. E. (2013). Postrecession Drivers of Preferences for Homeownership. *Housing Policy Debate*, 23(4), 666–687. <https://doi.org/10.1080/10511482.2013.823880>
- Durning, A. (2013). ADUs and Don'ts: The Gauntlet of Rules That In-law and Cottage Units Must Run. *Sightline Institute*.
- Duranton, G., & Turner, M. A. (2011). The Fundamental Law of Road Congestion: Evidence from US Cities. *American Economic Review*, 101, 2616–2652.
- Elkind, E. & Stone, E. (2006). *Falling Flat: Why the CEQA Affordable Housing Exemptions Have Not Been Effective* (working paper #2). Frankel Environmental Law and Policy Center, UCLA School of Law.
- Ewing, R., & Cervero, R. (2010). Travel and the Built Environment: A Synthesis. *Journal of the American Planning Association*, 76(3). <https://doi.org/10.1080/01944361003766766>
- Fannie Mae. (2019). HomeReady Accessory Unit Income and Boarder Income Flexibilities.
- Franco, C., Little, R. J. A., Louis, T. A., & Slud, E. V. (2019). Comparative Study of Confidence Intervals for Proportions in Complex Sample Surveys†. *Journal of Survey Statistics and Methodology*, 7(3), 334–364. <https://doi.org/10.1093/jssam/smy019>
- Frey, W. H. (2018). *The Millennial Generation: A Demographic Bridge to America's Diverse Future*. Metropolitan Policy Program at Brookings.
- Fulton, W. (2020). What Does California Housing Look Like in a Post-COVID World. *California Planning & Development Report*.
- Fulton, W., & Shigley, P. (2018). *Guide to California Planning* (5th ed.). Point Arena: Solano Press Books.
- Garcia, D. (2017). *ADU Update: Early Lessons and Impacts of California's State and Local Policy Changes*.
- Gebhardt, M., Gilden, B., & Kidron, Y. (2018). *Accessory Dwelling Units in Portland , Oregon ISS Survey 1 st Report*.
- Geffner, T. (2018). Towards a Smaller Housing Paradigm: a Literature Review of Accessory Dwelling Units and Micro Apartments. *University Honors Theses, Paper 515*. <https://doi.org/10.15760/honors.520>
- Gellen, M. (1985). *Accessory Apartments in Single-Family Housing*. New Brunswick: Center for Urban Policy Research.
- Guo, Z., Rivasplata, C., Lee, R., Keyon, D., & Schloeter, L. (2012). *Amenity or Necessity? Street Standards as Parking Policy*.
- Gyourko, J., & Molloy, R. (2014). *Regulation and Housing Supply* (No. 20536). Cambridge, Massachusetts.
- Haas, P., Morse, S., Becker, S., Young, L., & Esling, P. (2013). The influence of spatial and household characteristics on household transportation costs. *Research in Transportation Business and Management*, 7, 14–26. <https://doi.org/10.1016/j.rtbm.2013.03.004>
- Handy, S. (2005). Smart Growth and the Transportation-Land Use Connection: What Does the Research Tell Us? *International Regional Science Review*, 28(2), 146–167. <https://doi.org/10.1177/0160017604273626>
- Handy, S. (2017). Thoughts on the Meaning of Mark Stevens's Meta-Analysis. *Journal of the American Planning Association*, 83(1), 26–28. <https://doi.org/10.1080/01944363.2016.1246379>
- Hare, P. H. (1991). The Echo Housing / Granny Flat Experience in the US The Echo Housing / Granny Flat Experience in the US. *Journal of Housing for the Elderly*, 7(2), 57–70. <https://doi.org/10.1300/J081V07N02>

- Hase, G. (2019). San Jose to Consider Forgivable Loans for Backyard Cottages. *San Jose Inside*. Retrieved from <https://www.sanjoseinside.com/2019/09/09/san-jose-to-consider-forgivable-loans-for-backyard-cottages/>
- Henderson, J. (2011). Level of service: the politics of reconfiguring urban streets in San Francisco , CA. *Journal of Transport Geography*, 19(6), 1138–1144. <https://doi.org/10.1016/j.jtrangeo.2011.05.010>
- Hernandez, J. (2018). California Environmental Quality Act Lawsuits and California’s Housing Crisis. *Hastings Environmental Law Journal*, 24(1).
- Hernandez, J., Friedman, D., & DeHerrera, S. (2015). *In the Name of the Environment: How Litigation Abuse under the California Environmental Quality Act Undermines California’s Environmental, Social Equity and Economic Priorities - and Proposed Reforms to Protect the Environment from CEQA Litigation Abuse*.
- Hertel, M. (2020). Personal Communication.
- Hosmer, D., Lemeshow, S., & Sturdivant, R. (2013). *Applied Logistic Regression* (Third). Hoboken: Wiley & Sons.
- Housing Trust Silicon Valley. (2020). Small Homes, Big Impact. Retrieved from <https://housingtrustsv.org/programs/homeowner-programs/accessory-dwelling-unit-program/>
- Howard, R., Olhausen, M., & Walker, A. (2018, December 198). Assessing SB 35 – Success or Failure? *Gavel2Gavel Construction & Real Estate Law Blog*. Retrieved from <https://www.gravel2gavel.com/assessing-sb-35/>
- Howe, D. A. (1990). The Flexible House Designing for Changing Needs. *Journal of the American Planning Association*, 56(1), 69–77. <https://doi.org/10.1080/01944369008975746>
- Hymel, K. (2019). If You Built It, They Will Drive: Measuring Induced Demand for Vehicle Travel in Urban Areas. *Transport Policy*, 76, 57-66.
- Infranca, J. (2014). Housing Changing Households: Regulatory Challenges for Micro-Units and Accessory Dwelling Units. *Stanford Law and Policy Review*, 53.
- Institute of Transportation Engineers. (2010). *Transportation Impact Analyses for Site Development* (5th ed.). Washington, D.C.: Transportation Research Board.
- Jaffe, E. (2014, July). Transit Projects Are About to Get Much, Much Easier in California. *CityLab*.
- Jones, S. M. (2002). *CEQA’s Influence on Development in Alameda County, California* (Master’s thesis). San Jose State University.
- Kendall, M. (2018, September 4). Berkeley rejects controversial project that sought fast-track under new state law. *Mercury News*. Retrieved from <https://www.mercurynews.com/2018/09/04/berkeley-rejects-controversial-project-that-sought-fast-track-under-new-state-law/>
- Kettell, E. (2015). *Exploring Community Attitudes Towards Secondary Dwelling Units In Eugene’s University Area Neighborhood*. University of Oregon.
- Kim, T. K., Horner, M. W., & Marans, R. W. (2005). Life cycle and environmental factors in selecting residential and job locations. *Housing Studies*, 20(3), 457–473. <https://doi.org/10.1080/02673030500062335>
- Knox, P., & Pinch, S. (2010). *Urban social geography, an introduction*. *Urban Ecology* (Vol. 7). [https://doi.org/10.1016/0304-4009\(83\)90015-3](https://doi.org/10.1016/0304-4009(83)90015-3)
- Koziaz, J. (2020). How ADUs Could Transform Chicago into a More Affordable, Accessible Place to Live: Here’s What You Need to Know about the Return of Coach Houses, Granny

- Flats, and Attic and Basement Units. *Curbed Chicago*. Retrieved from <https://chicago.curbed.com/2020/2/28/21152809/adu-chicago-legalization-coach-house-granny-flat-affordable-housing>
- Laidley, T. (2016). Measuring Sprawl: A New Index, Recent Trends, and Future Research. *Urban Affairs Review*, 52(1), 66-97. <https://doi.org/10.1177/1078087414568812>
- Landis, J. D. (2004). *Ten Steps to Housing Affordability in the East Bay and California* (Reprint 2004-02). Institute of Urban and Regional Development, University of California, Berkeley.
- Landis, J. D., Pendall, R., Olshansky, R., & Huang, W. (1995). *Fixing CEQA: Options and Opportunities for Reforming the California Environmental Quality Act*. California Policy Seminar.
- Lasley, P. (2017). *The Influence of Transportation on Residential Choice: A Survey of Texas REALTORS on Factors Affecting Housing Location Choice*. Texas A&M University.
- Larson, P., & Perrus, J. (2010). Reforming Environmental Review. *Bench & Bar of Minnesota*, 67(1).
- Lee, A. E., & Handy, S. L. (in press). Leaving Level-of-Service Behind: The Implications of a Shift to VMT Impact Metrics. *Research in Transportation Business & Management*. <https://doi.org/10.1016/j.rtbm.2018.02.003>
- Lee, H. (2020). Are Millennials Coming to Town? Residential Location Choice of Young Adults. *Urban Affairs Review*, 56(2), 565–604. <https://doi.org/10.1177/1078087418787668>
- Liao, F. H., Farber, S., & Ewing, R. (2015). Compact development and preference heterogeneity in residential location choice behaviour: A latent class analysis. *Urban Studies*, 52(2). <https://doi.org/10.1177/0042098014527138>
- Liebig, P., Koenig, T., & Pynoos, J. (2006). Families' Values and Attitudes Regarding Responsibility for the Frail Elderly. *Journal of Aging & Social Policy*, 18(3–4), 155–172. <https://doi.org/10.1300/J031v18n03>
- Los Angeles City Department of Transportation. (2016). *Transportation Impact Study Guidelines*.
- Los Angeles City Departments of City Planning and Transportation. (2019). *Proposed California Environmental Quality Act (CEQA) Transportation Section Update*. Retrieved from https://ladot.lacity.org/sites/g/files/wph266/f/CEQA%20Thresholds%20with%20TAG%20Chapter%202_Guidelines_Chapter2_Clean%2020190219_v2.pdf
- Los Angeles County. (2015). *Assessor Parcels – 2015 Tax Roll* (database: eGIS_Cadastral). Retrieved from <https://egis3.lacounty.gov/dataportal/2016/04/06/assessor-parcels-2015-tax-roll/>
- Ma, Z, Becker, D. R., & Kilgore, M. (2009). Characterising the Landscape of State Environmental Review Policies and Procedures in the United States: A National Assessment. *Journal of Environmental Planning & Management*, 52(8), 1035-1051. <https://doi.org/10.1080/09640560903327591>
- Maaoui, M. (2018). A granny flat of one's own? The households that build accessory-dwelling units in Seattle's King county. *Berkeley Planning Journal*, 30(1), 102–116. <https://doi.org/10.5070/bp330137884>
- Mackey, K.V. (2014). Reforming the “Blob”: Why California's Latest Approach to Amending CEQA Is a Bad Idea. *Columbia Journal of Environmental Law*, 39, 357-389.
- Manville, M., Monkkonen, P., & Lens, M. (2020). It's Time to End Single-Family Zoning. *Journal of the American Planning Association*, 86(1), 106–112.

- <https://doi.org/10.1080/01944363.2019.1651216>
- McCabe, B. (2016). *No Place Like Home: Wealth, Community & the Politics of Homeownership*. New York: Oxford University Press.
- McKinsey Global Institute. (2016, October). *A Tool Kit to Close California's Housing Gap: 3.5 Million Homes by 2025*. McKinsey & Company. Retrieved from <https://www.mckinsey.com/~media/McKinsey/Featured%20Insights/Urbanization/Closing%20Californias%20housing%20gap/Closing-Californias-housing-gap-Full-report.ashx>
- Mercer, A., Lau, A., & Kennedy, C. (2018). *For Weighting Online Opt-in Samples, What Matters Most?* Retrieved from <http://www.pewglobal.org/2018/01/11/publics-globally-want-unbiased-news-coverage-but-are-divided-on-whether-their-news-media-deliver/>
- Micklow, A. C., & Warner, M. E. (2014). Not Your Mother's Suburb: Remaking Communities for a More Diverse Population. *Urban Lawyer*, 46(4), 729–751.
- Milam, R. (2012). *Transportation Impact Analysis Gets a Failing Grade When It Comes to Climate Change and Smart Growth*
- Monkkonen, P., Lens, M., & Manville, M. (2020). *Built-Out Cities? How California Cities Restrict Housing Production Through Prohibition and Process*.
- Moradibistouni, M. (2020). *Assessment of Zero Energy Prefabricated Accessory Dwelling Units in Support of New Zealand Housing Needs* Milad Moradibistouni. Victoria University of Wellington.
- Morales, R. (2019). *Evaluating Accessory Dwelling Unit (ADU) Friendliness: The Case of the San Gabriel Valley*. California State Polytechnic University, Pomona.
- Mukhija, V., Cuff, D., & Serrano, K. (2014). *Backyard Homes & Local Concerns: How Can Local Concerns Be Better Addressed?*
- Muller, P. (2004). Transportation and Urban Form: Stages in the Spatial Evolution of the American Metropolis. In S. Hanson (Ed.), *The Geography of Urban Transportation* (3rd ed., pp. 59–85). New York: Guildford Press.
- Myers, D. (2016). Peak Millennials: Three Reinforcing Cycles That Amplify the Rise and Fall of Urban Concentration by Millennials. *Housing Policy Debate*, 26(6), 928–947. <https://doi.org/10.1080/10511482.2016.1165722>
- Myers, D., & Gearin, E. (2001). Current preferences and future demand for denser residential environments. *Housing Policy Debate*, 12(4), 633–659. <https://doi.org/10.1080/10511482.2001.9521422>
- Næss, P., Peters, S., Stefansdottir, H., & Strand, A. (2018). Causality, not just correlation: Residential location, transport rationales and travel behavior across metropolitan contexts. *Journal of Transport Geography*, 69(January), 181–195. <https://doi.org/10.1016/j.jtrangeo.2018.04.003>
- National Association of Realtors. (2017). *National Community and Transportation Preferences Survey*.
- Neighbors for Smart Rail v. Exposition Metro Line Construction Authority, 57 Cal.4th 439 (Cal. 2013).
- Nelson, A. C. (2011). *The New California Dream: How Demographic and Economic Trends May Shape the Housing Market, a Land Use Scenario for 2020 and 2035*.
- Nemirow, A., & Chapple, K. (2012). *Yes, But Will They Let Us Build? The Feasibility of Secondary Units in the East Bay*.
- New York Department of Environmental Conservation. (2012). *Full Environmental Assessment Form (FEAF) Workbook*. Retrieved from

- https://www.dec.ny.gov/docs/permits_ej_operations_pdf/feafprint.pdf
- Nick-Kearney, K. (2019). *Accessory Dwelling Units and Microhousing: How Less Is More in California Housing*. California State University, Sacramento.
- Norris, A. (2019). 2020: The Year of the ADU. *Forbes*.
- Office of Planning and Research. (2013). *Preliminary Evaluation of Alternative Methods of Transportation Analysis*. Retrieved from <https://www.opr.ca.gov/docs/PreliminaryEvaluationTransportationMetrics.pdf>
- Office of Planning and Research. (2016). *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA*. Retrieved from https://www.opr.ca.gov/docs/Revised_VMT_CEQA_Guidelines_Proposal_January_20_2016.pdf
- Office of Planning and Research. (2017). Technical Advisory, (November).
- Office of Planning and Research. (2018, December). *Technical Advisory on Evaluating Transportation Impacts in CEQA*. Retrieved from http://opr.ca.gov/docs/20181228-743_Technical_Advisory.pdf
- O'Neill, M., Gualco-Nelson, G., & Biber, E. (2018). *Getting it Right: Examining the Local Land Use Entitlement Process in California to Inform Policy and Process*.
- O'Neill, M., Gualco-Nelson, G., & Biber, E. (2019). Developing Policy from the Ground up: Examining Entitlement in the Bay Area to Inform California's Housing Policy Debates. *Hastings Environmental Law Journal*, 25(1).
- Ojuri, O. (2015). *Assessing the Impact of California Senate Bill 743 on Transportation Planning, Traffic Impact Analysis, and Level-of-Service*. University of California, Irvine.
- Olshansky, R. (1996a). Evaluation of the California Environmental Quality Act. *Environmental Management*, 20(1), 11–23.
- Olshansky, R. (1996b). The California Environmental Quality Act and Local Planning. *Journal of the American Planning Association*, 62(3), 313–330.
- Pan, C. H., & Pirinsky, C. A. (2015). Social Influence in the Housing Market, 50(4), 757–779.
- Peduzzi, P., Concato, J., Kemper, E., Holford, T., & Feinstein, A. (1996). A Simulation Study of the Number of Events per Variable in Logistic Regression Analysis. *Journal of Clinical Epidemiology*, 49(12), 1373–1379. <https://doi.org/10.1016/j.amepre.2003.12.002>
- Pendall, R. (1998). Problems and Prospects in Local Environmental Assessment: Lessons from the United States. *Journal of Environmental Planning and Management*, 41(1), 5–24. <https://doi.org/10.1080/09640569811777>
- Pew Research Center. (2010). *Millennials: A Portrait of Generation Next*. <https://doi.org/10.1108/JCM-07-2013-0650>
- Pfeiffer, D. (2015). Retrofitting Suburbia through Second Units: Lessons from the Phoenix Region. *Journal of Urbanism*, 8(3), 279–301. <https://doi.org/10.1080/17549175.2014.908787>
- Pfeiffer, D. (2019). *Regulating ADUs in California: Local Approaches & Outcomes*.
- Plitt, A. (2020). To Solve NYC's Housing Crisis, City Wants to Legalize Basement Apartments and ADUs. *Curbed New York*.
- Raetz, H., Garcia, D., & Decker, N. (2019). *Residential Impact Fees in California: Current Practices and Policy Considerations to Improve Implementation of Fees Governed by the Mitigation Fee Act*.
- Ramsey-Musolf, D. (2018). *Accessory Dwelling Units as Low-Income Housing: California's Faustian Bargain*. *Urban Science* (Vol. 2). <https://doi.org/10.3390/urbansci2030089>

- Rappa, J. G. (2002). *Comparison of State Development Impact Fee Statutes*. OLR Research Report 2002-R-0842. Retrieved from <https://www.cga.ct.gov/2002/rpt/2002-R-0582.htm>
- Raymond, E. L., Dill, J., & Lee, Y. (2018). Millennial First-Time Homebuyers and Location Choice. *Journal of Planning Education and Research*.
<https://doi.org/10.1177/0739456X18807751>
- Reid, C. (2013). *To Buy or Not to Buy, understanding Tenure Preferences and the Decision-Making Processes of Lower-Income Households*.
- Reid, C., Galante, C., & Weinstein-Carnes, A. (2017). Addressing California's Housing Shortage: Lessons from Massachusetts Chapter B. *Journal of Affordable Housing*, 25(2).
- Reynolds, L. (2015). *Quicker, Easier, Cheaper? The Efficacy of CEQA Streamlining for Infill Development* (Master's thesis). California State University Sacramento.
- Roess, R. P., & Prassas, E. S. (2014). The Fundamental Concept of Level of Service. In *The Highway Capacity Manual: A Conceptual and Research History* (pp. 49–76). Switzerland: Springer International Publishing. <https://doi.org/10.1007/978-3-319-05786-6>
- Rose, E. (2011). Leveraging a New Law: Reducing greenhouse gas emissions under Senate Bill 375. Retrieved from [http://www.crec.berkeley.edu/Leveraging a New Law.pdf](http://www.crec.berkeley.edu/Leveraging%20a%20New%20Law.pdf)
- Rossi, P. H. (1955). *Why Families Move*. Glencoe, Ill.: Free Press.
- Rossi, P. H., & Shlay, A. B. (1982). Residential Mobility and Public Policy Issues. *Journal of Social Issues*, 38(3), 21–34. <https://doi.org/10.2307/2068403>
- Rothman, L. D. (2011). CEQA Turns Forty: The More Things Change, the More They Remain the Same. *Environmental Law News*, 20(1).
- Rothstein, R. (2017). *The Color of Law: A Forgotten History of How Our Government Segregated America*. New York: Liveright.
- Rudel, T. K. (1984). Household change, accessory apartments, and low income housing in suburbs. *Professional Geographer*, 36(2), 174–181. <https://doi.org/10.1111/j.0033-0124.1984.00174.x>
- Sacramento Area Council of Governments. (2020). SACOG Regional Housing Needs Plan: Cycle 6 (2021-2029).
- Salganik, M. J. (2006). Variance estimation, design effects, and sample size calculations for respondent-driven sampling. *Journal of Urban Health*, 83(7 SUPPL.), 98–112.
<https://doi.org/10.1007/s11524-006-9106-x>
- Salon, D. (2014). Final Report: Quantifying the effect of local government actions on VMT, 126. Retrieved from <http://www.arb.ca.gov/research/apr/past/09-343.pdf>
- Salon, D., & Kats, E. (2020). The Role of Transport in How We Choose Where to Live.
- Sanchez-Moyano, R., & Galante, C. (2016). *Small Houses, Big Impact: Accessory Dwelling Units in Underutilized Neighborhoods*.
- San Francisco Planning Department. (2016). *Executive Summary: Resolution Modifying Transportation Impact Analysis*.
- Schneider, B. (2018, April 18). YIMBYs Defeated as California's Transit Density Bill Stalls. *CityLab*.
- Smith-Heimer, J., Hitchcock, J., Roosa, P., & Guerrero, C. (2016). *CEQA in the 21st Century: Environmental Quality, Economic Prosperity, and Sustainable Development in California*. Retrieved from <https://rosefdn.org/wp-content/uploads/2016/08/CEQA-in-the-21st-Century.pdf>
- Shaver, K. (2017, December 9). Cities turn to “missing middle” housing to keep older millennials from leaving. *The Washington Post*. Retrieved from

- https://www.washingtonpost.com/local/trafficandcommuting/cities-turn-to-missing-middle-housing-to-keep-older-millennials-from-leaving/2017/12/09/3a129bc8-d54a-11e7-95bf-df7c19270879_story.html?utm_term=.1adcc2078c94
- Shoup, D. (2011). *The High Cost of Free Parking*. Chicago: American Planning Association.
- Southwood, K. (1974). Goodman and Kruskal's Tau-b as Correlation Ratio. *Sociological Methods & Research*, 3(1). <https://doi.org/10.2307/j.ctvk12qqv.15>
- Spevak, E. (2019). *The ABCs of ADUs*.
- Stahl, K. A. (2018). "Yes in My Backyard" Can a New Pro-Housing Movement Overcome the Power of NIMBYs? *Zoning and Planning Law Report*, 41(3).
- Stephens, J. (2020). Housing Development Likely to Crash Because of COVID. *California Planning & Development Report*.
- Stevens, M. R. (2017). Does Compact Development Make People Drive Less? *Journal of the American Planning Association*, 83(1). <https://doi.org/10.1080/01944363.2016.1240044>
- Talen, E., & Knaap, G. (2003). Legalizing Smart Growth: An Empirical Study of Land Use Regulation in Illinois. *Journal of Planning Education and Research*, 22, 345–359. <https://doi.org/10.1177/0739456X03252486>
- Taylor, M. (2015). *California's High Housing Costs: Causes and Consequences*. Sacramento, California: Legislative Analyst's Office.
- Taylor, P., & Pew Research Center. (2016). *The Next America*. Philadelphia: PublicAffairs.
- Thigpen, C., & Volker, J. (2017). Repurposing the Paving : The case of surplus residential parking in Davis , CA. *Cities*, 70, 111–121. <https://doi.org/10.1016/j.cities.2017.06.020>
- Thomas, T. (1993). CEQA Turns Twenty-One: In Defense of CEQA. *Land Use Forum*, 2(2).
- Train, K. E. (2002). *Discrete Choice Methods with Simulation*. Cambridge University Press. <https://doi.org/10.1017/CBO9780511805271>
- Transportation Research Board. (2009). *Driving and the Built Environment-The effects of compact development on motorized travel, energy use and CO2 emissions. Special Research Report* (Vol. 298). [https://doi.org/ISBN 978-0-309-14255-7](https://doi.org/ISBN%20978-0-309-14255-7)
- U.S. Census Bureau. (2010). Decennial Census.
- U.S. Census Bureau. (2011). American Housing Survey estimates.
- U.S. Census Bureau. (2015). Millennials Outnumber Baby Boomers and Are Far More Diverse, Census Bureau Reports. Retrieved from <https://www.census.gov/newsroom/press-releases/2015/cb15-113.html>
- U.S. Census Bureau. (2017a). 1-Year American Community Survey estimates.
- U.S. Census Bureau. (2017b). American Housing Survey estimates.
- U.S. Census Bureau. (2018a). 1-Year American Community Survey estimates. Washington, D.C.: U.S. Census Bureau.
- U.S. Census Bureau. (2018b). 5-Year American Community Survey estimates. U.S. Census Bureau.
- U.S. Department of Housing and Urban Development. (2018). *State of the Cities Data Systems Building Permits Database: table of housing unit building permits for Los Angeles, CA from 2001 through 2016* (compiled from the Census Bureau's Building Permits Survey). Retrieved from https://socds.huduser.gov/permits/output_annual.odt
- UC Davis Policy Institute for Energy Environment and the Economy. (2015). *Achieving California's Greenhouse Gas Goals: A Focus on Transportation*.
- Varady, D. P. (1988). Factors Affecting Middle-Income Elderly Interest in Accessory Apartment Conversion. *Journal of Architectural and Planning Research*, 5(1), 81–88.

- Varady, D. P. (1990a). Influences on the City-Suburban Choice A Study of Cincinnati Homebuyers. *Journal of the American Planning Association*, 56(1), 22–40. <https://doi.org/10.1080/01944369008975741>
- Varady, D. P. (1990b). Which Elderly Home Owners Are Interested in Accessory Apartment Conversion and Home-Sharing. *Journal of Housing for the Elderly*, 6(1–2), 87–100. <https://doi.org/10.1300/J081V06N01>
- Volker, J. M. B., Kaylor, J., & Lee, A. (2019). A New Metric in Town: A Survey of Local Planners on California’s Switch from LOS to VMT. *Transport Findings*. <https://doi.org/10.32866/10817>
- Volker, J. M. B., Lee, A. E., & Fitch, D. T. (2019). Streamlining the Development Approval Process in a Post-Level of Service Los Angeles. *Journal of the American Planning Association*, 85(2), 114–132. <https://doi.org/10.1080/01944363.2019.1601587>
- Wang, K., & Akar, G. (2020). Will Millennials Drive Less as the Economy Recovers: A Postrecession Analysis of Automobile Travel Patterns. *Journal of Planning Education and Research*. <https://doi.org/10.1177/0739456X20911705>
- Washington Department of Ecology. (n.d.). *SEPA Environmental Checklist*. Retrieved from <https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance>
- Wegmann, J. (2015a). *Financing Ancillary Apartments on Residential Properties: Challenges and Solutions*.
- Wegmann, J. (2015b). Research Notes: The Hidden Cityscapes of Informal Housing in Suburban Los Angeles and the Paradox of Horizontal Density. *Buildings & Landscapes*, 22(2), 89–111.
- Wegmann, J., & Chapple, K. (2012). *Understanding the Market for Secondary Units in the East Bay* (No. 2012–03).
- Wegmann, J., & Chapple, K. (2014). Hidden Density in Single-Family Neighborhoods: Backyard Cottages as an Equitable Smart Growth Strategy. *Journal of Urbanism*, 7(3), 307–329. <https://doi.org/10.1080/17549175.2013.879453>
- Wegmann, J., & Mawhorter, S. (2017). Measuring Informal Housing Production in California Cities. *Journal of the American Planning Association*, 83(2), 119–130. <https://doi.org/10.1080/01944363.2017.1288162>
- Wegmann, J., & Nemirow, A. (2011). *Secondary Units and Urban Infill : A Literature Review* (No. 2011–02).
- Wegmann, J., Nemirow, A., & Chapple, K. (2012). *Scaling up Secondary Unit Production in the East Bay: Impacts and Policy Implications* (No. 2012–05).
- Wegmann, J., Schafran, A., & Pfeiffer, D. (2017). Breaking the Double Impasse: Securing and Supporting Diverse Housing Tenures in the United States. *Housing Policy Debate*, 27(2), 193–216. <https://doi.org/10.1080/10511482.2016.1200109>
- Winstanley, A., Thorns, D. C., & Perkins, H. C. (2002). Moving House, Creating Home: Exploring Residential Mobility. *Housing Studies*, 17(6), 813–832. <https://doi.org/10.1080/02673030216000>
- Woetzel, J., Mischke, J., Peloquin, S., & Weisfield, D. (2016). *A Tool Kit to Close California’s Housing Gap: 3.5 Million Homes by 2025*.
- Zillow Group. (2016). *CONSUMER HOUSING TRENDS REPORT 2016*.

APPENDIX A – SURVEY INSTRUMENT ADMINISTERED IN STUDY 2

Note: The following is the full survey instrument I used for my second study (chapter 3 of this dissertation), showing the screener questions, the welcome prompt, all survey questions, and the logic and flow between them. The instrument appears exactly as I exported it from the Qualtrics online survey platform. It is the instrument that was administered by Qualtrics to the double-opt-in panel recruitment pool. I administered a functionally identical instrument to my other two recruitment pools.

Housing and Neighborhood Preferences Survey

Start of Block: Screener

Q2.2 Do you own your home (with or without mortgage)?

- ☐ Yes (1)
- ☐ No, I rent my home (2)
- ☐ Other. Please specify: (3) _____

Skip To: End of Block If Q2.2 != 1



Q2.6 What is your ZIP code?

End of Block: Screener

Start of Block: Welcome

Q1.1 Welcome to the **Housing and Neighborhood Preferences Survey!** Thank you for taking the time to help us. This survey will help researchers at the UC Davis Institute of Transportation Studies to better understand the ***housing preferences and needs of Sacramento- and Davis-area residents***, including their views on and use of accessory dwelling units (ADUs). ADUs are also known as in-law units or granny flats. **How long...** This survey has four sections and takes **10-15** minutes to complete. **What you get...** After completing the survey, you will be awarded the amount you agreed upon before you entered into the survey. **Confidentiality...** All information you provide is strictly confidential and for research purposes only. All survey results will be reported only in the aggregate, without any personally identifying information. **Participation is voluntary...** Your participation in this study is completely voluntary. You are free to decline to take part in the project. You can decline to answer any questions, and you can stop participating at any time. Whether or not you choose to participate, or answer any question, or stop participating in the project, there will be no penalty for you or loss of benefits to which you are otherwise entitled. **Questions?** If you

have any questions, please feel free to contact me: Jamey Volker PhD Candidate
Transportation Technology and Policy Graduate Group, UC Davis jvolker@ucdavis.edu

Page Break

End of Block: Welcome

Start of Block: Home Questions

Q2.1 In this **first set** of questions we'd like to learn about your primary residence - the place you call home.

Page Break

Q2.4 How would you describe the type of building you live in?

- ☐ Single-family detached house (1)
 - ☐ Attached condominium (2)
 - ☐ Townhouse (3)
 - ☐ Other (please specify): (4) _____
-

Q2.5 Approximately how many years ago did you move into your home?

- ☐ Less than 1 year (1)
 - ☐ 1-5 years (2)
 - ☐ 6-10 years (4)
 - ☐ More than 10 years (8)
-

Page Break

Q2.8 Does your home have a garage?

- ☐ Yes, a 1-car garage (1)
- ☐ Yes, a 2-car garage (2)
- ☐ Yes, a 3+-car garage (3)
- ☐ No (4)

Display This Question:

If Q2.8 != 4

Q2.9 How do you use your garage? Please check all that apply.

- ☐ For automobile storage and repair (1)
- ☐ For other storage (2)
- ☐ As an additional bedroom or independent living space for my household (4)
- ☐ As an independent living space rented to others (5)
- ☐ As an office, play room, laundry room, or other type of additional room (3)
- ☐ Other. Please specify: (6) _____



Q2.10 How many off-street automobile parking spaces does your home have **outside** of a garage (e.g. spaces in an uncovered driveway or covered carport)?



Q2.11 How many automobiles does your household own (or lease) and park at home?

Page Break

Q82 Have you ever done (yourself) or commissioned major renovations or additions to your home or any other property you have owned?

☐ Yes (1)

☐ No (2)

Q2.13 Have you ever rented out your house or a room or unit in a building you owned for residential purposes? Please check all that apply.

☐ Yes, I have rented my house or a room in my house to a long-term tenant (1)

☐ Yes, I have rented a separate property that I own to a long-term tenant (3)

☐ Yes, I have rented my house or a room in my home to a short-term guest (e.g. via Airbnb, VRBO, or HomeAway) (5)

☐ Yes, I have rented a room in a separate property that I own to a short-term guest (e.g. via Airbnb, VRBO, or HomeAway) (6)

☐ No, I have never rented out for residential purposes a room or unit in a building I own (4)

End of Block: Home Questions

Start of Block: ADU Questions - General

Q3.1 The questions in this **second section** relate to **Accessory Dwelling Units**, or **ADUs**. ADUs are also known as *secondary dwelling units*, *in-law units*, *granny flats*, and *casitas*, among other terms.

For purposes of this survey, an **ADU** is defined as any residential dwelling unit that: is located on the same parcel as a single-family residence (e.g. a single-family house); and provides complete independent living facilities (i.e. *permanent provisions for living, sleeping, eating, cooking, and sanitation*).

ADUs can be either: located within the single-family residence on the parcel (e.g. a converted basement), attached to the single-family residence (e.g. a converted attached garage),

or located in a separate structure detached from the single-family residence (e.g. a standalone backyard cottage, or a converted detached garage).

Page Break

Q3.2 Do you know anyone, including yourself, who has either (1) lived in an ADU, or (2) owned an ADU and rented it out?

- ☐ Yes, more than one person (1)
 - ☐ Yes, one person (2)
 - ☐ No (3)
-

Q3.3 Do you know if homeowners are allowed to build ADUs in the neighborhood where your home is?

- ☐ Yes, ADU construction is allowed in at least some circumstances (1)
 - ☐ No, ADU construction is not allowed (2)
 - ☐ I don't know (3)
-

Page Break

Q3.4 Do you have an ADU on the same parcel as your home? For purposes of this question, it does not matter whether the ADU is officially permitted or not.

- ☐ Yes (1)
 - ☐ No (2)
 - ☐ Other. Please specify: (3) _____
-

Q3.5 Besides the parcel on which your current home is located, have you ever owned another residential parcel with an ADU on it?

- ☐ Yes, I currently own another parcel with an ADU on it (1)
- ☐ Yes, I used to own another parcel with an ADU on it (2)
- ☐ No, I have never owned another parcel with an ADU (3)
- ☐ Other. Please specify: (4) _____

End of Block: ADU Questions - General

Start of Block: ADU Questions - Homeowners without ADUs

Q4.1 Have you ever ***attempted to build*** or ***considered building*** an ADU on the ***same parcel as your current home?***

- ☐ Yes, I am currently in the process of building an ADU (1)
- ☐ Yes, I am currently considering building an ADU, but I am not yet in the permitting or construction process (2)
- ☐ Yes, I have attempted to build an ADU in the past (3)
- ☐ Yes, I have considered building an ADU in the past, but I have never attempted to permit or build one (4)
- ☐ No, but I would consider building one in the future (5)
- ☐ No, I do not want an ADU on the same parcel as my home (6)

Display This Question:

If Q4.1 = 6

Q4.2 Please list the top reason(s) you do not want an ADU on the same parcel as your home:

Page Break

Display This Question:

If Q4.1 != 6

Q4.3 Please indicate how much the following potential benefits of owning an ADU have motivated you or would motivate you to build an ADU on the same parcel as your current home.

	No motivation (1)	Minor motivation (2)	Major motivation (3)
Gaining additional income (from renting the ADU) (1)	☐	☐	☐
Increasing my property value (2)	☐	☐	☐
Housing myself, a family member, or a friend right away (3)	☐	☐	☐
Housing myself, a family member, or a friend in the future (4)	☐	☐	☐
Creating an office, workshop, playhouse, or other useful activity space (5)	☐	☐	☐
Creating additional storage space (6)	☐	☐	☐
Helping with the housing crisis (9)	☐	☐	☐
Other. Please specify: (7)	☐	☐	☐

Page Break

Display This Question:

If Q4.1 != 6

Q4.4 What is, or what do you expect would be, the single biggest obstacle to building an ADU on the same parcel as your current home?

Page Break

Display This Question:

If $Q4.1 \neq 6$

Q4.5 Please indicate how much of an obstacle the following have been or would be to building an ADU on the same parcel as your current home.

	Not an obstacle (1)	Minor obstacle (2)	Major obstacle (3)	I don't know (4)
Construction costs (1)	☐	☐	☐	☐
Development fees and permitting costs (2)	☐	☐	☐	☐
Difficulty obtaining financing (3)	☐	☐	☐	☐
Financial risk (4)	☐	☐	☐	☐
Confusing ADU regulations (5)	☐	☐	☐	☐
ADU setback restrictions (16)	☐	☐	☐	☐
ADU height restrictions (17)	☐	☐	☐	☐
ADU parking requirements (18)	☐	☐	☐	☐
Other zoning restrictions on ADU construction and siting (19)	☐	☐	☐	☐
Difficulty working with local government staff (including permitting delays) (7)	☐	☐	☐	☐
Difficulty working with contractors (including construction delays) (8)	☐	☐	☐	☐
Opposition from neighbors (11)	☐	☐	☐	☐

Limitations on
using ADUs for
short-term rentals
(e.g. via Airbnb,
VRBO, or
HomeAway) (12)

☐☐☐☐

Other. Please
specify: (20)

☐☐☐☐

Page Break

Q4.6 Do you think the government should make ADU construction more achievable for homeowners?

☐ Yes (2)

☐ No (3)

End of Block: ADU Questions - Homeowners without ADUs

Start of Block: ADU Questions - ADU Owners

Q5.1 You indicated earlier in this **second section** that you own an accessory dwelling unit on the same parcel as your home. The following questions are about that ADU.

Page Break

Q5.2 How big is your ADU (in square feet)?

0 200 400 600 800 1000 1200 1400 1600 1800 2000

ADU size (square feet) ()	
---------------------------	--

Q5.3 What kind of ADU do you have?

- ☐ It is built within my home (e.g. a converted basement) (2)
- ☐ It is attached to my home (e.g. a converted attached garage) (3)
- ☐ It is detached from my home (e.g. a standalone backyard cottage, or a converted detached garage) (4)
- ☐ Other. Please specify: (5) _____

Page Break

Q5.4 Tell us about your past, present, and potential future ADU use. Please check all that apply.

	Past use (1)	Current use (2)	Potential future use (4)	Not applicable (5)
Live in it (living quarters for at least one person in my household) (1)	☐	☐	☐	☐
Rent it to family members on a long-term basis (could be paid or unpaid) (3)	☐	☐	☐	☐
Rent it to friends on a long-term basis (could be paid or unpaid) (4)	☐	☐	☐	☐
Rent it to other tenants on a long-term basis (could be paid or unpaid) (5)	☐	☐	☐	☐
Rent it on a short-term basis (e.g. via Airbnb, VRBO, or HomeAway) (6)	☐	☐	☐	☐
Use it as an extra bedroom(s) for guests (7)	☐	☐	☐	☐
Use it as an office, workshop, playhouse, or other useful activity space (8)	☐	☐	☐	☐
Use it as additional storage space (9)	☐	☐	☐	☐
Leave it vacant (10)	☐	☐	☐	☐
Other. Please specify: (11)	☐	☐	☐	☐

Page Break

Display This Question:

If Q5.4 = 3 [2]

Or Q5.4 = 4 [2]

Or Q5.4 = 4 [2]



Q5.5 How many people currently live in your ADU? We'll call them your **ADU tenant(s)**.

Display This Question:

If Q5.4 = 3 [2]

Or Q5.4 = 4 [2]

Or Q5.4 = 5 [2]

Q5.6 Do you receive rent from your ADU tenant(s)?

☐ Yes (1)

☐ No, my tenant(s) provide(s) in-kind services in exchange for lodging (2)

☐ No, I let my tenant(s) stay for free (3)

Display This Question:

If Q5.6 = 1

Q5.7 On average, how much monthly rent (excluding payments for utilities) do you receive from your ADU tenant(s)?

0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000

Monthly rent (U.S. dollars) ()



Page Break

Q83 ***Before owning an ADU***, had you ever rented out your house or a room or unit in a building you owned for residential purposes? Please check all that apply.

- ☐ Yes, I had rented my house or a room in my house to a long-term tenant (1)
 - ☐ Yes, I had rented a separate property that I own to a long-term tenant (3)
 - ☐ Yes, I had rented my house or a room in my home to a short-term guest (e.g. via Airbnb, VRBO, or HomeAway) (5)
 - ☐ Yes, I had rented a room in a separate property that I own to a short-term guest (e.g. via Airbnb, VRBO, or HomeAway) (6)
 - ☐ No, I had never rented out for residential purposes a room or unit in a building I own (4)
-

Page Break

Q5.8 Did you build (or convert) the ADU after purchasing your home?

- ☐ Yes (1)
- ☐ No, but I got the ADU permitted for residential occupancy after purchasing my home (2)
- ☐ No (3)

Display This Question:

If Q5.8 = 1

Q5.9 Approximately how long ago did you build your ADU?

- ☐ Less than 1 year (1)
- ☐ 1-5 years (2)
- ☐ 6-10 years (3)
- ☐ More than 10 years (4)

Display This Question:

If Q5.8 = 1

Q5.10 How long did the ADU construction process take?

- ☐ Less than 3 months (1)
- ☐ 3-6 months (2)
- ☐ 7-12 months (3)
- ☐ More than 12 months (4)

Page Break

Display This Question:

If Q5.8 = 1

Q5.11 Who designed your ADU? Please check all that apply.

- ☐ Myself and/or another owner of the property (1)
 - ☐ A friend and/or family member (7)
 - ☐ A paid contractor (3)
 - ☐ A paid architect/designer (5)
 - ☐ Other. Please specify: (6) _____
-

Display This Question:

If Q5.8 = 1

Q5.12 Who did the physical labor construction on your ADU? Please check all that apply.

- ☐ Myself and/or another owner of the property (1)
 - ☐ A friend and/or family member (4)
 - ☐ A paid contractor (2)
 - ☐ Other. Please specify: (3) _____
-

Display This Question:

If Q5.8 = 1

Q2.12 Before building your ADU, had you ever done (yourself) or commissioned major renovations or additions to your home or any other property you have owned?

☐ Yes (1)

☐ No (2)

Page Break

Display This Question:

If Q5.8 != 3

Q5.13 How much did it cost to build and permit your ADU? If you permitted your ADU but did not build it, include just the permitting costs. If you built your ADU but have not yet permitted it, include just the building costs.

0 100000 200000 300000 400000 500000

Cost to build and permit your ADU (U.S. dollars)
()



Display This Question:

If Q5.8 != 3

Q5.14 How did you finance the construction and/or permitting of your ADU? Please check all that apply.

- ☐ Home equity loan (1)
- ☐ Home equity line of credit (2)
- ☐ Cash out refinance (3)
- ☐ Construction loan (4)
- ☐ Personal loan (5)
- ☐ Loan from a family member or friend (9)
- ☐ Cash/savings (6)
- ☐ Other. Please specify: (7) _____
- ☐ I don't remember (8)

Q5.15 Is your ADU officially permitted for residential occupancy?

- ☐ Yes (1)
- ☐ No, but it is in the permitting process (2)
- ☐ No (3)

Page Break

Display This Question:

If Q5.8 != 3

Q5.16 Please indicate how much the following potential benefits of owning an ADU motivated you in deciding to build and/or permit your ADU.

	No motivation (1)	Minor motivation (2)	Major motivation (3)
Gaining additional income (from renting the ADU) (1)	☐	☐	☐
Increasing your property value (2)	☐	☐	☐
Housing myself, a family member, or a friend right away (3)	☐	☐	☐
Housing myself, a family member, or a friend in the future (4)	☐	☐	☐
Creating an office, workshop, playhouse, or other useful activity space (5)	☐	☐	☐
Creating additional storage space (6)	☐	☐	☐
Helping with the housing crisis (9)	☐	☐	☐
Other. Please specify: (7)	☐	☐	☐

Page Break

Display This Question:

If Q5.8 != 3

Q5.17 What was the single biggest obstacle you faced in building and/or permitting your ADU?

Page Break

Display This Question:

If $Q5.8 \neq 3$

Q5.18 Please indicate how much of an obstacle the following were in building and/or permitting your ADU.

	Not an obstacle (1)	Minor obstacle (2)	Major obstacle (3)	Not applicable (4)
Construction costs (1)	☐	☐	☐	☐
Development fees and permitting costs (2)	☐	☐	☐	☐
Difficulty obtaining financing (3)	☐	☐	☐	☐
Financial risk (4)	☐	☐	☐	☐
Confusing ADU regulations (5)	☐	☐	☐	☐
ADU setback restrictions (16)	☐	☐	☐	☐
ADU height restrictions (17)	☐	☐	☐	☐
ADU parking requirements (18)	☐	☐	☐	☐
Other zoning restrictions on ADU construction and siting (19)	☐	☐	☐	☐
Difficulty working with local government staff (including permitting delays) (7)	☐	☐	☐	☐
Difficulty working with contractors (including construction delays) (8)	☐	☐	☐	☐
Opposition from neighbors (11)	☐	☐	☐	☐

Limitations on
using ADUs for
short-term rentals
(e.g. via Airbnb,
VRBO, or
HomeAway) (12)

☐☐☐☐

Other. Please
specify: (20)

☐☐☐☐

Page Break

Display This Question:

If Q5.8 != 3

Q5.19 Is there anything you wish you had known during the ADU building and/or permitting process? Please specify:

Page Break

End of Block: ADU Questions - ADU Owners

Start of Block: Neighborhood Preferences

Q6.1 In this **third set** of questions we'd like to learn about your neighborhood preferences, and what characteristics were important to you in choosing where to live.

Page Break

Q6.2 In this question, we'd like to know how important the following factors were when choosing where to live - choosing your current home and neighborhood. Please tell us **how**

important each of the characteristics was on a scale from “not at all important” to “very important”.

	Not at all important (1)	Slightly important (2)	Moderately important (3)	Very important (4)
My commute time (1)	☐	☐	☐	☐
Commute time for another person in my household (47)	☐	☐	☐	☐
Close to public transportation (48)	☐	☐	☐	☐
Spacious homes (3)	☐	☐	☐	☐
Close to shops, restaurants, services, etc. (49)	☐	☐	☐	☐
Variety or quality of shops, restaurants, services, etc. (50)	☐	☐	☐	☐
Good schools (4)	☐	☐	☐	☐
Close to parks or nature (5)	☐	☐	☐	☐
Walkable or bikeable neighborhood (6)	☐	☐	☐	☐
Easy to drive places (7)	☐	☐	☐	☐
Quiet neighborhood (8)	☐	☐	☐	☐
Safe neighborhood (9)	☐	☐	☐	☐
Parking availability (10)	☐	☐	☐	☐

Page Break

Q6.3 How comfortable would you be with your neighbor renting out an ADU?

- ☐ I wouldn't like it, and I would actively oppose it (1)
- ☐ I wouldn't like it, but I wouldn't actively oppose it (2)
- ☐ I'd be fine with it, but I wouldn't actively support it (3)
- ☐ I'd be fine with it, and I would support it (5)

Page Break

Q6.4 Do you think your neighbor renting out an ADU would have a negative impact on the neighborhood? Please check all that apply.

☐ Yes - too many cars trying to park on my street (1)

☐ Yes - too much noise (2)

☐ Yes - unruly tenants (3)

☐ Yes - tenants could invade my privacy (4)

☐ Yes - Other. Please specify: (5)

☐ No - there would be no negative impact (6)

End of Block: Neighborhood Preferences

Start of Block: Personal and Household Characteristics

Q7.1 In this **fourth and final set** of questions we'd like to learn a little bit more about you and your household.

Page Break



Q7.2 In what year were you born? (Enter your answer as YYYY)

Q7.3 Please indicate how many people (*including yourself*) in each of the following age categories live in your home.

	Number of People (1)

<15 (years old) (1)	
15-24 (2)	
25-34 (3)	
35-44 (4)	
45-54 (5)	
55-64 (6)	
65-74 (7)	
>75 (8)	

Page Break

Q7.5 Last year, what was your approximate **household** income before taxes? This includes your income plus the income(s) of any other household member(s) with whom you share income.

- ☐ (1)
- ☐ \$10,000 - \$24,999 (2)
- ☐ \$25,000 - \$49,999 (3)
- ☐ \$50,000 - \$74,999 (4)
- ☐ \$75,000 - \$99,999 (5)
- ☐ \$100,000 - \$124,999 (6)
- ☐ \$125,000 - \$149,999 (7)
- ☐ \$150,000 - \$174,999 (8)
- ☐ \$175,000 - \$199,999 (9)
- ☐ \$200,000 or more (10)

Page Break

Q7.7 Are you a student, staff member, or faculty member at UC Davis?

☐ Yes (1)

☐ No (3)

Display This Question:

If Q7.7 = 1

Q7.8 Did you complete the UC Davis Campus Travel Survey in October 2018?

☐ Yes (1)

☐ No (3)

Page Break

Q7.9 What is your highest level of formal education completed?

- ☐ No formal education (1)
 - ☐ Grade school or junior high school (2)
 - ☐ High school diploma or equivalent (3)
 - ☐ Associate's degree or technical school certificate(s) (4)
 - ☐ Four-year bachelor's degree(s) (5)
 - ☐ Graduate or professional degree(s) (6)
-

Q7.10 What is your race, ethnicity, or origin? Please select all that apply:

- ☐ Black or African American (1)
 - ☐ Asian (2)
 - ☐ Pacific Islander or Native Hawaiian (3)
 - ☐ Hispanic/Latinx (4)
 - ☐ White (5)
 - ☐ Native American (6)
 - ☐ Other. Please specify: (7) _____
 - ☐ Prefer not to say (8)
-

Q7.11 With which gender do you most identify?

- ☐ Woman (1)
- ☐ Man (2)
- ☐ Non-binary (3)
- ☐ Prefer not to say (5)

End of Block: Personal and Household Characteristics

APPENDIX B – INTERVIEW SCRIPT AND PROMPTS USED IN STUDY 3

Note: The following are the script and question prompts I generally followed in all 20 interviews I did with millennial households for my third study (chapter 4 of this dissertation). I asked the listed questions only when the interviewees did not broach the topics organically.

Housing Location Choice Interview Script Sheet

Intro icebreaking chit chat...

Thanks for agreeing to participate in this interview. It's one of a few dozen that we are doing for this study. We're looking at how people make neighborhood and housing choices – what factors are important, how families balance competing needs and constraints, etc. I mostly just want to hear your stories, and keep the interview conversational.

Before we get started, I want to assure you that all of your responses will be confidential. We will not identify you in our reports. With your permission, I will tape our conversation, so that we can transcribe your comments word for word. I expect this interview to last for about 45 minutes, followed by a 10- to 15-minute written survey.

And, of course, at the end you'll get \$100 as a thank you for your time.

Do you have any questions before we get going?

Do you have any limitations on time?

Theme and Prompt	Topics of Interest	Notes
Ice-breaker	When did you move here?	
	Where did you move from?	
	Why this area?	
How did you decide to move here? To this region? This neighborhood? This house? Tell me your story! Take me through your journey.		
	What was your first step?	
	Did you divvy up tasks between you?	

	What regional factors did you consider?	
	What neighborhood factors?	
	What house or property factors?	
	Were any of the factors more important than the others?	
	After price, was any factor or factors clearly more important than the others?	
	Did you seriously consider any other alternative homes or neighborhoods? How did they differ from this house [OR the house you choice]?	
	How did you research those	

	criteria? What sources did you use?	
	How did you determine whether the houses you considered would meet your transportation needs?	
	How did you compare the transportation costs with the housing costs?	
	Did you consider changing neighborhood types from where you lived before?	
	If not, why not?	
	Was there something you wanted but couldn't find in the housing market here? A type of house? A type of neighborhood?	
Do you like it here?	Focus respondents on neighborhood and house if possible (rather than region or state)	

Where do you see yourselves in 10 years?		
	Same type of house?	
	Same type of neighborhood?	
Do you have any questions for me?		

Thanks so much for your time!

APPENDIX C – SURVEY INSTRUMENT ADMINISTERED IN STUDY 3

Note: The following is the full survey instrument I administered to each interviewee in my third study (chapter 4 of this dissertation), showing the welcome prompt, all survey questions, and the logic and flow between the questions.

Millennial Housing Choice Survey

Start of Block: Welcome

QI Welcome to the **Millennial Housing Choice Survey**! Thank you for taking the time to help us, and for sitting down with us earlier. This survey will help UC Davis researchers to better understand *why Millennials choose to live where they do*. This survey takes about **10 minutes to complete**.

Your identifying information, including your home and work addresses, will be kept strictly confidential, and only used to match your survey responses to your interview.

Q56 Please provide your name and email address:

1. First Name (1) _____
 2. Last Name (2) _____
 3. Email (3) _____
-

Page Break



Q59 When were you born? (Enter your answer as MM/DD/YYYY)

Page Break



Q75 Approximately when did you purchase your current house? (Enter your answer as MM/DD/YYYY)

Q76 Approximately how much did you purchase your house for?

- 4. Less than \$300,000 (1)
- 5. \$300,000 - \$399,999 (2)
- 6. \$400,000 - \$499,999 (3)
- 7. \$500,000 - \$599,999 (4)
- 8. \$600,000 - \$699,999 (5)
- 9. \$700,000 - \$799,999 (6)
- 10. \$800,000 - \$899,999 (7)
- 11. \$900,000 - \$999,999 (8)
- 12. \$1,000,000 - \$1,099,999 (9)
- 13. \$1,100,000 - \$1,199,999 (10)
- 14. \$1,200,000 - \$1,299,999 (11)
- 15. \$1,300,000 - \$1,399,999 (12)
- 16. \$1,400,000 - \$1,499,999 (13)
- 17. \$1,500,000 or more (14)

End of Block: Welcome

Start of Block: What was your neighborhood like?

Page Break

Q152 How would you describe the type of housing unit in which you lived **before** you moved into your current house?

- 18. Duplex (1)
 - 19. Townhouse (2)
 - 20. Single-family detached house (3)
 - 21. Apartment/condo (4)
 - 22. Other (please specify): (5) _____
-

Q55 How long had you lived in that **previous** house before moving into your current house?

- 23. Less than 1 year (1)
 - 24. 1-2 years (2)
 - 25. 2-3 years (4)
 - 26. 3-4 years (5)
 - 27. 4-5 years (6)
 - 28. 5-10 years (7)
 - 29. More than 10 years (8)
-

Q154 Please indicate the approximate location of your **previous** residence before you moved into your current house. Note that your response to this question will be kept **entirely confidential**, and will only be used for purposes of this study without reference to your name or other identifying information.

- 30. Your street (1) _____
 - 31. Nearest cross-street (2) _____
 - 32. City (3) _____
 - 33. State (4) _____
 - 34. ZIP code (5) _____
 - 35. Country (6) _____
-

Q119 Did you rent or own your **previous** residence before you moved into your current residence?

- 36. Rent (1)
- 37. Own (2)

End of Block: What was your neighborhood like?

Start of Block: Your daily travel options in your previous neighborhood

Q68 When traveling to places you regularly went before you moved into your current house, what travel options were available to you? Please select all that apply:

1. Personal car, truck, or van (1)
2. Carpool in another person's vehicle (16)
3. Bus or trolley bus (2)
4. Light rail, streetcar, or trolley car (3)
5. Subway or metro (4)
6. Commuter train (5)
7. Ferryboat (6)
8. Airplane (28)
9. Taxicab, car sharing (e.g. Zipcar), or other mobility service (e.g. Lyft, Uber, etc.) (7)
10. Motorcycle (8)
11. Bicycle (including a bike-sharing service or an e-bicycle) (9)
12. Walking (10)
13. Skateboarding (14)
14. Telecommuting (35)
15. Other (please specify): (13) _____

End of Block: Your daily travel options in your previous neighborhood

Start of Block: Your daily travel options now

Q79 When traveling to places you regularly go since moving into your current house, what travel options are available to you? Please select all that apply:

16. Personal car, truck, or van (1)
17. Carpool in another person's vehicle (16)
18. Bus or trolley bus (2)
19. Light rail, streetcar, or trolley car (3)
20. Subway or metro (4)
21. Commuter train (5)
22. Ferryboat (6)
23. Airplane (28)
24. Taxicab, car sharing (e.g. Zipcar), or other mobility service (e.g. Lyft, Uber, etc.) (7)
25. Motorcycle (8)
26. Bicycle (including a bike-sharing service or an e-bicycle) (9)
27. Walking (10)
28. Skateboarding (14)
29. Telecommuting (35)
30. Other (please specify): (13) _____

Page Break

Q80 Since moving into your current house, which travel options do you use **more** than you used to in your previous neighborhood? Please select all that apply:

- 31. Personal car, truck, or van (1)
- 32. Carpool in another person's vehicle (16)
- 33. Bus or trolley bus (2)
- 34. Light rail, streetcar, or trolley car (3)
- 35. Subway or metro (4)
- 36. Commuter train (5)
- 37. Ferryboat (6)
- 38. Airplane (28)
- 39. Taxicab, car sharing (e.g. Zipcar), or other mobility service (e.g. Lyft, Uber, etc.) (7)
- 40. Motorcycle (8)
- 41. Bicycle (including a bike-sharing service or an e-bicycle) (9)
- 42. Walking (10)
- 43. Skateboarding (14)
- 44. Telecommuting (35)
- 45. Other (please specify): (13) _____

Page Break

Q81 Since moving into your current house, which travel options do you use **less** than you used to in your previous neighborhood? Please select all that apply:

- 46. Personal car, truck, or van (1)
- 47. Carpool in another person's vehicle (16)
- 48. Bus or trolley bus (2)
- 49. Light rail, streetcar, or trolley car (3)
- 50. Subway or metro (4)
- 51. Commuter train (5)
- 52. Ferryboat (6)
- 53. Airplane (28)
- 54. Taxicab, car sharing (e.g. Zipcar), or other mobility service (e.g. Lyft, Uber, etc.) (7)
- 55. Motorcycle (8)
- 56. Bicycle (including a bike-sharing service or an e-bicycle) (9)
- 57. Walking (10)
- 58. Skateboarding (14)
- 59. Telecommuting (35)
- 60. Other (please specify): (13) _____

End of Block: Your daily travel options now

Start of Block: What is your current neighborhood like?

Q213 In this question, we'd like to know what your **current** neighborhood is like. Please indicate **how true** each of the characteristics is for your **current** neighborhood on a scale from "not at all true" to "entirely true."

	Not true (1)	Somewhat true (2)	Very true (3)	Don't know (4)
Attractive appearance of neighborhood (1)	38.	39.	40.	41.
Variety in housing types (tract housing, apartments, etc) (2)	42.	43.	44.	45.
High level of upkeep in neighborhood (3)	46.	47.	48.	49.
Large yards in the neighborhood (4)	50.	51.	52.	53.
Lots of off-street parking (garages or driveways) (5)	54.	55.	56.	57.
Sidewalks throughout the neighborhood (6)	58.	59.	60.	61.
Good bicycle routes beyond the neighborhood (7)	62.	63.	64.	65.
Housing units in the neighborhood are located on cul-de-sacs rather than through streets (8)	66.	67.	68.	69.
The neighborhood has easy access to the freeway (9)	70.	71.	72.	73.
There is good public transit service (bus or rail) to and from the neighborhood (10)	74.	75.	76.	77.
Parks and open spaces nearby (11)	78.	79.	80.	81.
Shopping areas within walking distance (12)	82.	83.	84.	85.

Other amenities such as a pool or a community center available nearby (13)	86.	87.	88.	89.
Easy access to a regional shopping mall (14)	90.	91.	92.	93.
Easy access to downtown (15)	94.	95.	96.	97.
Easy access to medical services (33)	98.	99.	100.	101.
Easy access to work (29)	102.	103.	104.	105.
Easy access to schools (30)	106.	107.	108.	109.
Lots of people out and about within the neighborhood (20)	110.	111.	112.	113.
Lots of interaction among neighbors (21)	114.	115.	116.	117.
Low level of car traffic on neighborhood streets (16)	118.	119.	120.	121.
Safe neighborhood for walking (17)	122.	123.	124.	125.
Safe neighborhood for bicycling (22)	126.	127.	128.	129.
Safe neighborhood for kids to play outdoors (18)	130.	131.	132.	133.
Low crime rate within neighborhood (19)	134.	135.	136.	137.

Good public schools (27)	138.	139.	140.	141.
Good private schools (28)	142.	143.	144.	145.
Close to friends (31)	146.	147.	148.	149.
Close to family (32)	150.	151.	152.	153.

Page Break

End of Block: What is your current neighborhood like?

Start of Block: Your household's other characteristics

Q55 Where do you and your partner work?

	City of primary workplace	State of primary workplace	ZIP code of primary workplace	Street of primary workplace	Nearest cross- street of primary workplace
	(1)	(1)	(1)	(1)	(1)
You (10)					
Your partner (1)					

Q69 Did you or your partner change jobs in the **year before** you purchased your current house?

154. Yes (1)

155. No (2)

Display This Question:

If Q69 = Yes

Q68 Where did you and/or your partner work prior to changing jobs?

	City of primary	State of primary	ZIP code of primary	Street of primary	Nearest cross- street of primary

	former workplace	former workplace	former workplace	former workplace	former workplace
	(1)	(1)	(1)	(1)	(1)
You (10)					
Your partner (1)					

Page Break

Q57 How many (operational) vehicles are available to you and your household for daily travel? By vehicles we mean passenger cars, SUVs, vans, pick-up trucks, and motorcycles.

0 1 2 3 4 5 6 7 8 9 10



Q58 Did you purchase (or otherwise obtain) an additional vehicle after moving to your current house? By vehicles, we mean passenger cars, SUVs, vans, pick-up trucks, and motorcycles.

156. Yes (1)

157. No (4)

Page Break

End of Block: Your household's other characteristics

Start of Block: Personal characteristics

Q65 Where did you grow up (spend the most significant chunk of your childhood)?

	City	State	ZIP code	Country
	(1)	(1)	(1)	(1)
I grew up in: (10)				

Q66 What type of neighborhood did you grow up in (spent the most significant chunk of your childhood)?

- 158. Urban (1)
 - 159. Suburban (2)
 - 160. Rural (3)
 - 161. Other (please specify) (4)
-

Q67 How would you describe the type of housing unit in which you grew up (spent the most significant chunk of your childhood)?

- 162. Duplex (1)
 - 163. Townhouse (2)
 - 164. Single-family detached house (3)
 - 165. Apartment/condo (4)
 - 166. Other (please specify): (5)
-

Q194 What is your race or ethnicity? Please select all that apply:

61. Black or African-American (1)

62. Asian (2)

63. Pacific-Islander or Native Hawaiian (3)

64. Hispanic (4)

65. White (5)

66. American Indian or Alaskan Native (6)

67. Other (please specify): (7) _____

End of Block: Personal characteristics
