

Converting Garages into Housing

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Abstract

Cities have a large supply of garages that could be converted into affordable housing in single-family neighborhoods, but minimum parking requirements prevent converting most of these garages into apartments. We examine how cities can relax off-street parking requirements for houses with converted garages. In Residential Parking Permit Districts, cities can limit the number of on-street parking permits allowed at any address with a second unit. This policy can remove on-street parking congestion as a reason for neighbors to oppose garage conversions, double the potential number of housing units in single-family neighborhoods, and increase the supply of safe, affordable housing.

Keywords

second unit, garage conversion, affordable housing, parking reform

Land use controls are best analyzed as collective property rights under the control of economically rational voters.

William Fischel, *Zoning Rules*

Introduction

American cities have a large, untapped supply of affordable housing: garages that could be converted into apartments. Garage conversions provide a simple, inexpensive, and nearly invisible way for homeowners to create additional housing and reshape their homes to fit changing household circumstances. But off-street parking requirements in zoning codes often present an insurmountable barrier to converting garages into housing.

In explaining his influential “homevoter hypothesis” about the economics of zoning, William Fischel (2000, 404) described zoning as “a collective property right that is used by the municipality to maximize the net worth of those in control of the political apparatus.” If zoning is used to maximize property values, then garage conversions present a conundrum. A converted garage can increase a home’s value, but if many homeowners convert their garages into housing, the neighborhood could become crowded with cars and people and the value of all homes might decline. Given this dilemma, we investigate a new zoning option that can encourage residents to approve garage conversions in their neighborhood as a matter of local self-interest. If this zoning option is successful, cities can achieve both the individual and social benefits of converting garages into housing without imposing costs on neighboring homeowners.

Converted garages in single-family neighborhoods are variously called second units, accessory dwelling units,

garage apartments, granny flats, companion units, and backyard cottages. For our analysis, we focus on parking reforms that enable converting garages into second units. We conclude by extending the findings to other types of second units, including apartments carved out within the main house. Our key contribution is to examine how cities can relax off-street parking requirements for houses with second units without congesting on-street parking, arousing opposition from neighbors, or compromising local neighborhood quality.

In addition to benefiting individual homeowners, second units increase the affordable housing stock. Karen Chapple (2014) found that second units in the San Francisco Bay Area rent for less than comparable units and are more affordable than multifamily infill developments, which have high construction costs. Second units can also count toward meeting a city’s regional fair-share obligation to provide affordable housing.

Michael Lens and Paavo Monkkonen (2016) found that density limits in zoning codes concentrate affluence in low-density, single-family neighborhoods and segregate cities by income. Single-family zoning creates higher-income enclaves that are, in essence, gated communities with

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Table 1. Share of Unpermitted Single-Family Units in the Largest MSAs, 2000–2014.

MSA	Increase in Number of Housing Units	Number of Building Permits	Number of New Units without Permits	Percentage of New Units without Permits	Wharton Regulatory Index
	(1)	(2)	(3) = (1) – (2)	(4) = (3) / (1)	(5)
Los Angeles	454,728	155,344	299,384	66	0.51
New York	566,167	235,846	330,321	58	0.63
Boston	205,337	86,102	119,235	58	1.54
Philadelphia	317,891	153,821	164,070	52	1.03
Chicago	514,888	292,800	222,088	43	0.06
Miami	298,554	188,632	109,922	37	NA
Washington, DC	398,169	279,401	118,768	30	0.33
Dallas	608,604	459,609	148,995	24	-0.35
Atlanta	582,114	471,479	110,635	19	0.04
Houston	581,674	526,312	55,362	10	-0.19
Total	4,528,127	2,849,346	1,678,781	37	

Sources: Gyourko, Saiz, and Summers (2008), US Census Bureau (2000, 2015), US Department of Housing and Urban Development (1985-2013, 2015). Methodology follows Wegmann (2014) and Wegmann and Mawhorter (2017) and accounts for potential housing loss between 2000 and 2014 because of fire, weather, demolition, etc.

Note: MSA = Metropolitan Statistical Area.

invisible gates. In research on density in Seattle, Bertolet (2017) found that “approximately one-third of Seattle’s land area lost population since 1970, because it is zoned for single family houses but families have been shrinking.” Second units can reduce this income segregation and population decline by creating affordable housing that allows the second-unit residents to live in neighborhoods they otherwise couldn’t afford. Second units can both raise property values and provide affordable housing on the same piece of land.

We address the following research question: How can cities relax off-street parking requirements for houses with second units without crowding on-street parking, arousing political opposition, or compromising neighborhood quality? We answer this question with a focus on Los Angeles, where median-income renters now spend nearly half their yearly income on rent (Zillow 2015), and where two-thirds of new single-family units added between 2000 and 2014 were unpermitted (see Table 1). Our policy recommendations can be adopted in other cities to allow garage conversions and increase the affordable housing supply.

The Importance of Unpermitted Housing

Although we primarily rely on examples from Los Angeles to illustrate our points, housing units without legal permits are surprisingly widespread in the United States. To estimate the increase in the number of unpermitted single-family housing units in the ten largest Metropolitan Statistical Areas (MSAs), we compared the number of new single-family housing units reported in the US Census with the number of single-family building permits reported by the US Department of Housing and Urban Development. (Detached inhabited garages are counted as single-family housing units

in both data sets.) Column 4 in Table 1 suggests that, between 2000 and 2014, 37 percent of new single-family units were unpermitted. In total, 1.7 million unpermitted housing units were added in the ten largest MSAs.

Column 5 shows the Wharton Residential Land Use Regulatory Index developed by Gyourko, Saiz, and Summers (2008). This index measures the strictness of land use regulation in cities. Cities with more regulation have higher values and those with less regulation have lower values. The cities with more regulatory barriers to new housing (Boston, Los Angeles, New York, and Philadelphia) have high shares of unpermitted units in their metropolitan areas while the cities with fewer barriers (Atlanta, Dallas, and Houston) have low shares. These findings echo Wegmann and Mawhorter (2017), who found that unpermitted units comprise higher shares of new units in dense urban areas—where the supply of housing is constrained—than in either medium- or low-density cities.

We will examine Los Angeles, which has the highest percentage of unpermitted new units (66 percent) to illustrate how parking requirements have contributed to unpermitted housing and how parking reform can create a pathway to legalizing one prevalent type of unpermitted housing: garage conversions.

What Do We Know about Second Units and Their Parking Requirements?

Second Units as Affordable Housing

Garage apartments are attractive to single-person households, who accounted for 28 percent of all US households in 2014 (Bachman and Barua 2015). Young adult family members are another source of demand for garage apartments. In

2012, 36 percent of Americans between eighteen and thirty-one years old lived in their parents' home, the highest share since 1968, when comparable data became available (Fry 2013). Garage apartments can provide housing not only for the young but also for the old and their caretakers. A Beverly Hills survey found that 42 percent of second unit residents were over the age of 55 and that 37 percent were caregivers (City of Beverly Hills 2013). Garage apartments can also allow homeowners to age in place or to downsize without moving, desires expressed by 85 percent of adults older than sixty-five (AARP 2014).

Parking Requirements for Second Units

Despite their promise for homeowners and communities, garage conversions face strict requirements regarding size, design, safety, occupancy, and off-street parking. Previous research indicates that off-street parking requirements are the greatest barrier to second units (Durning 2013). Cities in the Los Angeles region typically require a two-car garage for every single-family home and an additional parking space for any second unit (Mukhija, Cuff, and Serrano 2014). Manville (2016) found that requiring parking with housing increases the odds that a household will own a car. Households with cars, not the housing itself, increase the demand for parking.

Because off-street parking requirements impede legally converting garages into housing, Wegmann (2015b, 96) says, "permitted apartments created from garages and other non-residential spaces are relatively rare." Many garages converted without permits are therefore hidden from city code enforcement. Thus, garage conversions not only evade off-street parking requirements but also escape important safety and design regulations. Code officials, who operate as "street-level bureaucrats," often lack the time, skill, or staff to enforce "pragmatically unenforceable" building codes such as parking requirements for second units (Andrews et al. 2016, 113 and 123). Strict enforcement can result in the eviction of "tenants who lack other realistic housing options" (Wegmann and Mawhorter 2017, 122).

How Parking Requirements Prevent Affordable Housing

Half of all US renters in 2010 spent more than 30 percent of their income on housing, and 27 percent paid more than half of their income for housing (Joint Center for Housing Studies of Harvard University 2013, 6). Nevertheless, most cities continue to require parking for cars but not affordable housing for people. Almost all cities require off-street parking spaces for single-family houses, and many cities require that the off-street spaces be covered, either in a garage or a carport (an off-street parking space with a roof supported by posts). For example, a survey of parking requirements in the San

Francisco Bay Area found that most cities required covered off-street parking spaces; one city, San Ramon, required up to four covered parking spaces per dwelling unit (Metropolitan Transportation Commission 2012).

To legally convert a garage into housing, off-street parking requirements typically force a homeowner to replace the two parking spaces previously provided by the garage with two new off-street parking spaces. Most cities also do not allow tandem parking spaces (one in front of the other) to meet the off-street parking requirements because of a fear that tandem spaces will not be as fully used as traditional side-by-side spaces (Willson 2013, 54). Replacing covered side-by-side parking spaces not only consumes scarce land but is also expensive. Based on averages from US metropolitan areas, costs range from about \$4,300 to construct a covered carport to more than \$18,000 for a replacement garage (Moselle 2014). The requirement for covered and nontandem off-street parking makes it almost impossible—financially and physically—for most homeowners to convert garages for cars into houses for people.

Not in My Neighbor's Backyard

While relaxed parking requirements for second units can increase the supply of affordable housing, homeowners often oppose garage conversions in their own neighborhood because of concerns about on-street parking (Mukhija, Cuff, and Serrano 2014). Although the residents of second units are less likely than others to own cars, a survey in Berkeley, CA, found that about three-quarters of second-unit residents *do* own cars (Chapple et al. 2011, 8), some of which are parked on the street. Thus, converting a two-car garage into a dwelling can add three cars parked on the street, and neighbors may fear that the conversions will quickly congest on-street parking.

Explaining why she opposed second units, one planning commissioner in a Southern California city said that she bought her house in a neighborhood "where I wouldn't have to worry if I was going to be able to park in front of my own house" (Hofmann 2003). Second units face severe political problems if city planning commissioners fear that the new residents will create parking problems.

This fear is exaggerated. In a survey of residential garages in Los Angeles, Arnold et al. (2012, 44) found that 75 percent of garages were used to store "rejected furniture and cascading bins and boxes of mostly forgotten household goods," not cars. In addition, many older garages are simply too small to accommodate larger modern vehicles such as pickup trucks or sports utility vehicles (Wegmann 2015b). Therefore, garage conversions are unlikely to displace many cars from garages because many cars are *already* in driveways or on the streets.

Nevertheless, many residents fear garage conversions will lead to overcrowded on-street parking. Some Chicago

neighborhoods built in the nineteenth century, for example, had coach houses, many of which were later converted to second units. In 1957, however, Chicago banned living in buildings that were formerly occupied by horses. The previous conversions were grandfathered, but new conversions became illegal. In 2003, Chicago's Metropolitan Planning Council recommended a change in zoning to again allow converting coach houses to human habitation, with no off-street parking required for the new housing. But cars, not horses, were the issue. Chicago Alderman Bernard Stone commented, "The real problem today [in 2003] is that most existing coach houses are in areas where there already is a lack of parking." Public health was the pretext for prohibiting people from living in coach houses, but parking was the real problem (Shoup 2011, 463).

Managing On-Street Parking and Reforming Off-Street Parking Requirements

Zoning that prohibits converting garages to apartments is not necessarily irrational. Suppose we accept William Fischel's hypothesis that "Land use controls are best analyzed as collective property rights under the control of economically rational voters" (Fischel 2015, 1). If so, the most promising way to convince economically rational voters to allow garage conversions is to devise an improved zoning option that will lead homeowners to support garage conversions as a matter of self-interest.

Our premise is that instead of requiring off-street parking to prevent crowding the on-street spaces, cities can better manage the on-street parking. We propose a two-step strategy in parking permit districts to prevent converted garages from creating on-street parking problems. At any address with a second unit, the city can

1. limit the number of on-street parking permits for cars registered at that address, and
2. remove the requirement that off-street parking spaces must be covered and nontandem.

Together, these reforms address concerns about both on-street parking congestion and the cost of required parking for second units. The first reform—to limit the number of on-street parking permits for cars registered at an address with a second unit—is designed to remove on-street parking congestion as a reason for neighbors to object to garage conversions. Limiting the number of on-street parking permits issued at an address with a second unit can prevent any parking problem for neighbors. Parking is not the only reason why neighbors may object to second units, but it is a major reason and a politically powerful one. If cities can remove parking as a source of objection to second units, the other issues (such as concerns about noise or attracting lower-income residents to high-income neighborhoods) can be discussed

more openly. The second reform—to remove the requirement that off-street parking must be *covered* and *non-tandem*—is designed to remove severe financial and physical barriers to converting garages into housing. Other zoning regulations for parking and second units (location, size, safety, construction materials, and occupancy limits) can remain largely unchanged.

Limit the Number of On-Street Parking Permits

A residential parking permit (RPP) district is necessary to limit on-street parking by residents at an address with a converted garage, but is not sufficient to prevent spillover parking because many cities issue permits for all the cars registered at any address. Although cities create permit districts only where parking is already scarce, they can be irresponsible about the number of permits issued. For example, a political firestorm erupted in San Francisco when journalists discovered that romance novelist Danielle Steel had twenty-six residential parking permits for her mansion in Pacific Heights (Glionna 2002).

To solve the on-street parking problem, cities can impose an *if-then* condition for garage conversions: *If* an owner converts a garage to housing, *then* the address is subject to a limit for on-street parking permits. This if-then condition can be adopted in existing or newly established RPP districts, which are created through neighborhood petitions on a block-by-block basis (City of Los Angeles 2017).

There are good precedents for this if-then policy. In 2017, California adopted legislation (Senate Bill 35) that prohibits local governments from requiring off-street parking for some multifamily developments "when on-street parking permits are required but not offered to the occupants of the development." In 2016, Washington, DC, halved its off-street parking requirements for multifamily buildings near transit with the provision that the residents cannot receive residential parking permits (ZoningDC 2016). Similarly, Eugene, OR, limits the number of residential parking permits at an address to the number of cars that can park in front of the address (City of Eugene 2016). Berkeley's 2015 Accessory Dwelling Unit Ordinance states that "no Residential Parking Permit for on-street parking may be issued to the address of the Accessory Dwelling Unit" (City of Berkeley 2015, 3). Limiting the number of on-street parking permits at any address with a converted garage, or prohibiting permits for second-unit residents altogether, can mitigate the parking-related concerns of neighbors and thus reduce the political opposition to garage conversions.

Some cities now use a vehicle's license plate number as its parking permit, and enforce compliance by using vehicles with license plate-recognition cameras that scan for parked cars with license plates lacking a corresponding permit (Wood 2014). In addition to streamlining enforcement, the system ensures that only cars registered to residents may receive permits. For example, in order to apply for a

residential parking permit, the City of Los Angeles requires individuals to submit vehicle registration associated with an address within the permit district, as well as proof of residency within the district (Los Angeles Department of Transportation 2017).

The option to convert a garage into housing in exchange for a limit on parking permits is far less restrictive than prohibiting garage conversions entirely. Furthermore, if a city limits the number of on-street parking permits only at addresses with second units, the neighbors without second units can continue receiving permits as usual.

After a city has created a clear path to legalizing garage conversions, it may begin targeted code enforcement following a grace period during which homeowners may comply with new regulations. While heavy-handed enforcement would previously have been “inhumane” because of the widespread displacement it would have caused, enforcement can now encourage regularizing the illegal conversions along with a limit to on-street parking (Wegmann and Mawhorter 2017). For example, Lawndale, CA, requires an inspection and a report that “states whether the property is in compliance with the requirements for off-street parking” before any residential property is sold (City of Lawndale 2016). A similar inspection-at-sale requirement in other cities would lead homeowners to upgrade or remove illegal garage conversions. Limiting the number of on-street parking permits at addresses with a second unit can therefore reduce rather than increase on-street parking congestion.

A city can introduce garage conversions as a pilot program on a small scale rather than as a citywide policy. The policy could be tried first in an existing RPP district near good public transit. Mukhija, Cuff, and Serrano (2014) found that 44 percent of Los Angeles neighborhood council members believe second units should be easier to build within a quarter-mile of a rail station. Walkable neighborhoods are particularly suitable for second unit construction (Been, Gross, and Infranca 2014). In these select neighborhoods, the city can offer the option of a Second Unit District (SUD) coterminous with the RPP district. In the SUD, single-family homeowners who apply for a building permit to convert a garage to housing would be exempt from the requirement that off-street parking must be provided in non-tandem, covered spaces, and they would in turn agree to a limit on the number of on-street parking permits at the address. Just as blocks opt to join RPP districts by petition from a majority of their property owners, any block could opt to join the SUD by petition from a majority of its property owners. Alternatively, if a city wants to encourage, or “nudge,” neighborhoods to allow converting garages to housing, it could make the entire RPP district an SUD but allow a majority of the property owners on any block to opt out (Thaler and Sunstein 2008). SUDs can potentially double the number of housing units in single-family neighborhoods.

Remove the Requirement for Covered Off-Street Parking Spaces

There is growing legislative precedent for reducing or removing off-street parking requirements for second units. In 2016, California passed three bills to ease parking requirements for second units. First, Assembly Bill 2299 requires cities to allow both uncovered and tandem parking in driveways to satisfy off-street parking requirements when a garage is converted or demolished to construct a second unit (California Assembly 2016a). Second, Assembly Bill 2406 states that no additional parking is required for second units of 500 square feet or less within the primary home (California Assembly 2016b). Third, Senate Bill 1069 prohibits parking requirements for second units if the second unit is within a half-mile from public transit, within a historically significant neighborhood, within one block of a car share area, or in a district where parking permits are required but are not provided to the second-unit occupant (California Senate 2016). In addition to new state laws, some cities have made it easier for homeowners to add second units by allowing uncovered and tandem off-street parking (City of Santa Cruz 2015) or by removing off-street parking requirements for second units altogether (City of Portland 2016).

Some cities offer permits that allow residents to park on the street in front of their own driveway (City of Hermosa Beach 2015; Chicago Department of Transportation 2017). This system effectively adds a reserved curb space in front of every house. If residents convert their garages into housing, these block-your-own-driveway permits can give property owners one guaranteed on-street parking space for themselves, guests, home help, and service vehicles.

Garage Conversions and Urban Design

The large scale and bad design of some high-density infill projects often provoke opposition from homeowners who want to preserve their neighborhood’s physical character. In contrast, garage apartments do not overwhelm existing houses and may even go unnoticed by neighbors. Garage conversions merely swap people for cars or storage, leaving exteriors virtually unchanged. Critics cannot say that a converted garage will be out of scale in the neighborhood because the garage is already there. Garage apartments create horizontal, distributed, and almost invisible density instead of vertical, concentrated, and obtrusive density. Homeowners may begin to consider their garages like unfinished attics or basements that can be converted into living space when the need arises.

Figure 1 shows single-family homes with converted garages in front of and behind the house. Both have enough parking to accommodate two, three, or more cars parked in the driveway or on the street in front of the house.

Because most garage conversions have been illegal, most of them have been in homeowners’ backyards, where they



Figure 1. Garages converted to second units at the front and back of houses.

are inconspicuous. Few homeowners would be foolhardy enough to illegally convert a street-facing garage into housing because it would be obvious to everyone, including city inspectors. The conversion investment would therefore be risky because of the high chance of being cited for two violations: converting the garage to housing and not having the required off-street parking. Nevertheless, street-facing garages may be the most suitable for conversion to housing, for several reasons.

First, street-facing garages already comply with zoning-required setbacks and height limits. Second, converting a street-facing garage into an apartment will not reduce privacy in the homeowner's or the neighbors' backyards. The garage apartment's resident will also have more privacy with a separate entrance to the street. Third, converting a street-facing garage that is part of the house into an apartment should be cheaper than converting a freestanding backyard garage. The apartment can connect with the electricity, central heating, air conditioning, and plumbing in the main house, and can have a door into the main house if the apartment is occupied by a family member or caregiver. Fourth, fire engines or ambulances can easily access a garage apartment in the front, removing an objection often raised against backyard cottages. Fifth, garage residents will provide more eyes on the street, and the homeowners can feel safer while they are away if someone is living in the former garage. Sixth, converting a street-facing garage into an apartment

can improve both the architecture of the house and the urban design of the street. Street-facing garages can be much more valuable for people than for cars.

All this can be accomplished with little adverse impact to parking or aesthetics. Cars can still park side-by-side in the driveway of a front-facing converted garage. If a garage abuts the sidewalk and has no driveway, the city can issue a block-your-own-driveway permit to provide a guaranteed on-street parking space along the curb cut in front of the house. Moreover, a city can require design review for any garage conversion to ensure that it is consistent with the design of both the house and the neighborhood.

The two renderings in Figure 2 illustrate the improvements possible when a residential façade replaces a garage door that formerly dominated the front of a house. (The entry door to the second unit can be in the side setback.)

Even if parking requirements are reformed, garage conversions will continue to face other restrictions, such as setback requirements. For example, many backyard garages were built at the property lines; if converted, they would have to comply with residential setback requirements. California addressed this problem in 2016 with Assembly Bill 2299, which states, "No setback shall be required for an existing garage that is converted to an accessory dwelling unit" (California Assembly 2016a). While cities should allow owners to convert their garages without meeting new setback requirements, they can require that conversions comply with all the other planning and safety regulations for second units.

The Benefits of Parking Reform

While planning requirements such as minimum lot size, owner occupancy, and architectural review also limit garage conversions, our proposal focuses on changing the parking requirements for both the main home and second unit. Even if most other regulations for second units remain the same, parking reforms can still increase the number of permitted garage conversions.

Existing requirements for covered off-street parking spaces prevent on-street parking congestion mainly by preventing second units, and most garage conversions that do occur are confined to the unregulated housing market rather than the formal market. Some homeowners ignore not just parking requirements but important safety precautions when converting their garages without building permits. These unregulated garage units may then not adhere to building codes, thus exacerbating existing concerns over the safety of converted garages (Mukhija 2014). Parking requirements thus spark a chain reaction. To evade the parking requirements, homeowners illegally convert their garages into housing unregulated second units.

While less expensive for homeowners and renters, illegal conversions can create critical safety shortfalls, such as improperly installed wiring that may cause fires (City of Azusa 2016). Without proper safety oversight "people are



Figure 2. Design improvements from street-facing garage conversions, Los Angeles, CA.

getting hurt or killed in unpermitted housing far too often,” notes Los Angeles County zoning enforcement planner, Jonathan Bell (Reyes-Velarde 2015). Each year, news outlets report fire-related deaths in garage conversions, attributing these preventable deaths to missing safety features such as smoke detectors (Orange County Registrar 2007). Bell suggests that “removing requirements for on-site covered parking facilities at residences could enable more legal garage conversions” and that enforcing safety standards will improve the quality of affordable housing (Reyes-Velarde 2015). In addition to safety concerns, unpermitted second units also imperil residents’ tenure security as they are not protected by measures that shield renters, such as just-cause eviction rules or rent control (Wegmann 2015a). Removing the requirement to provide *covered, nontandem* parking for single-family residences can therefore reduce a financial barrier to legality and can increase the number of formal conversions, which will benefit the occupants with increased safety and amenities.

Affordable Housing

Edward Glaeser (2011) and other urban economists have argued that high housing prices result not from a shortage of land but from a zoning-induced shortage of building permits. Parking reforms that allow second units can provide a new

supply of small, well-located, and high-quality dwellings within walking distance of local stores and public transit. Off-street parking requirements prevent higher densities even where land values are high. In contrast, allowing homeowners to convert their garages into second units will allow the market to supply more housing with less parking and less traffic.

Using publicly available rental listings for more than one hundred second units in Los Angeles County, we find that second units are diverse in size, cost, and location. Second units—including garage conversions—can be found in nearly every neighborhood in Los Angeles, including affluent ones. Second units thus have the potential to expand housing across entire cities and regions, rather than in select pockets, which will increase housing choice for residents with varied location and neighborhood preferences. Because about 40 percent of zoned land in the City of Los Angeles is zoned for single-family homes (City of Los Angeles 2016), inclusion of second units can substantially increase the housing stock.

Using Craigslist, we surveyed rental listings of second units in Los Angeles County in May 2016. We compiled a database of 109 rental listings from across the county and found that the average second unit in Los Angeles has one bedroom, one bathroom, and kitchen facilities; is 714 square feet; and rents for \$1,560 per month. These averages obscure

Table 2. Cost and Revenue for Converting a Two-Car Garage into a 400 Square Foot Apartment.

	Low	High
Construction cost		
Architectural plans	\$3,000	\$5,000
Permit fees	\$2,000	\$3,000
Construction	\$45,000	\$60,000
Fixtures	\$10,000	\$12,000
Total	\$60,000	\$80,000
Monthly cost		
Mortgage payment	\$474	\$633
Property tax	\$50	\$67
Maintenance	\$50	\$67
Insurance	\$73	\$73
Total	\$647	\$838
Monthly gross revenue	\$1,440	\$1,440
Monthly net revenue	\$793	\$602

Source: Construction cost is from Pearl Remodeling (2016).

Note: Mortgage interest rate is 5% per year. Property tax is 1% per year of original capital cost. Maintenance is calculated as 1% of original capital cost. In 2017, the average homeowners insurance was \$791 per year (Value Penguin 2017).

the diversity among listed second units, which have between zero and three bedrooms and are between 150 and 3,000 square feet. Rents range from \$650 to \$5,500 per month, with the most expensive second units located in the most expensive neighborhoods, such as Santa Monica and Venice. We then used Zillow to compare the cost of second units to similar-sized standard apartments located in the same neighborhood using neighborhood boundaries defined by the Mapping LA Neighborhood project (*Los Angeles Times* 2017). On average, second units rent for 89 percent of the rent for comparable units in the same neighborhood. Second units may have lower rents because of their informal status, lower quality, or the fact that second units do not require many of the maintenance costs that formal units do, such as hiring a building manager.

By creating new affordable housing, garage conversions can reduce the demand for existing affordable housing—which is in short supply—by increasing both the number of units and their geographical availability. If reformed parking requirements allow it, garage apartments can create income-integrated communities not only in the sense of income diversity within a neighborhood but also of people with different incomes living on the same piece of property. The garage apartments will be what has been called naturally occurring affordable housing (NOAH): units that are affordable without being supported by public subsidies. Because the residents of the new garage apartments will not be competing for the existing supply of affordable housing, the benefits of the new NOAH units will trickle sideways and lower the rent of all other housing.

Adding to the supply of affordable housing can have widespread economic benefits beyond the benefits to the occupants of garage apartments. Hsieh and Moretti (2017) argue that restrictions on the housing supply in high-productivity cities like New York, San Francisco, and San Jose lowered growth of the US economy by more than 50 percent from 1964 to 2009. Garage conversions can quickly and cheaply increase the housing supply in these cities and increase the rate of economic growth.

The Economics of Garage Conversions

Converting garages into housing may have far-reaching benefits for homeowners, including an improved financial footing. According to Pearl Remodeling, a company that converts garages into livable space in Los Angeles, the cost of converting a two-car garage into a 400-square-foot apartment ranges from \$60,000 to \$80,000 (Table 2; Pearl Remodeling 2016). If the homeowner finances the conversion at 5 percent interest over a fifteen-year period, monthly loan payments would be between \$474 and \$633 per month. The average rent for a 400–450-square-foot second unit in Los Angeles in our sample is \$1,440, so the rent from a garage apartment can cover the mortgage payments and give the homeowner between \$602 and \$793 per month in additional income. If the owner pays for the conversion without borrowing and the cost is \$60,000, the rate of return on the investment is 25 percent per year and the payback period is 3.9 years; if the conversion costs \$80,000, the rate of return is 18 percent per year and the payback period is 5.4 years.

Because legalization can increase property values, home buyers may be able to take out mortgages that consider the value of the second units, and existing homeowners may be able to draw on home equity loans tied to the value of the main home to pay for converting their garages to housing (Lundquist 2012). While homeowners were previously not allowed to borrow against the rental income of second units to finance garage conversions (M. J. Brown and Watkins 2012), recent changes to mortgage lending programs underscore the growing recognition that second-unit rental income can expand homeownership to more households. In California, as of May 2017, the California Housing Financing Agency now includes second-unit rental income in mortgage calculations for first-time homebuyers (California Housing Finance Agency 2017). Nationally, Fannie Mae's HomeReady loans now count second unit rent as qualifying income in mortgage applications (Fannie Mae 2016), and the HomeStyle program now includes second units in property appraisals (Fannie Mae 2017). Legalizing garage conversions and other second units will cement their role in homeownership finance and support households for whom homeownership was previously out of reach.

Legalizing existing garage apartments and easing the conversion of more garages into housing can greatly increase

Table 3. Increase in Single-Family Housing Units in Los Angeles County, 1980–2014.

Period	Increase in Number of Single-Family Units	Number of Single-Family Building Permits	Number of New Single-Family Units without Permits	Percentage of New Single-Family Units without Permits
(1)	(2)	(3)	(4) = (2) – (3)	(5) = (4) / (2)
1980–1989	299,839	135,195	164,644	55
1990–1999	240,430	62,872	177,558	74
2000–2014	328,497	50,843	277,654	85
Total	868,765	248,910	619,855	71

Sources: US Census Bureau (1980, 1990, 2000, 2015), US Department of Housing and Urban Development (1985–2013, 2015). Methodology follows Wegmann (2014) and Wegmann and Mawhorter (2017) and accounts for potential housing loss between 2000 and 2014 due to fire, weather, demolition, etc.

and improve the housing stock. To estimate the increase in the number of unpermitted housing units in ten cities in Los Angeles County between 1981 and 2010, Wegmann (2014, 80) compared the number of new single-family housing units reported in the US Census with the cities' data on the number of single-family building permits issued. Both data sets count detached inhabited garages as single-family housing units. From this comparison Wegmann estimated that 20,744 of the 37,702 new census-reported single-family housing units were unpermitted (55 percent). Extending the same methodology to all housing units in California cities with more than 1,000 residents, Wegmann and Mawhorter (2017, 126) found that for every 100 permitted units added to the housing stock in the 1990s there were an additional 37 unpermitted units. In the next decade, for every 100 permitted units added, there were an additional 28 unpermitted units. They also found that in dense urban cores, the added number of unpermitted housing units rivaled the added number of permitted housing units.

As shown in Table 3, we replicated Wegmann and Mawhorter's (2017) methodology for all single-family homes in Los Angeles County. While Table 1 shows the share of unpermitted houses in a single decade, here we measure how the share of unpermitted houses changed in Los Angeles County from 1980 to 2014. Table 3 shows that an increasing share of single-family homes in Los Angeles are unpermitted; since 2000, 85 percent of all single-family homes added in the county have been unpermitted.

While these numbers seem high, they square with other estimates of unpermitted units in Los Angeles. A 1987 survey by the *Los Angeles Times* estimated that there were more than forty-two thousand illegal garage conversions in the county (Chavez and Quinn 1987). In 2006, the Chief of Code Enforcement for the Los Angeles Building and Safety Department estimated that 90 percent of existing garage apartments were unpermitted (Pollard-Terry 2006). Analyzing real estate data of homes for sale, Vinit Mukhija (2014, 47) estimated that 50,000 single-family homes in the City of Los Angeles had an unpermitted second unit.

Illegal second units are so pervasive that the California Association of Realtors amended its Residential Purchase

Agreement and Joint Escrow Instructions in 2002 to minimize the risk of illegal units being exposed to regulatory action. The Instructions prohibit potential homebuyers from requesting an inspection by any government employee before the sale. Creating a pathway for legalizing second units will encourage owners to invest in making their converted garages safer and more permanent.

Some owners may not want to borrow money to convert a garage, or may have too little equity to do so. A policy that can help in this case is being tested in Portland, OR. The government offers to build a second unit on a single-family property if the homeowner agrees to allow a homeless family to live in it rent free for five years, after which the homeowner has unrestricted use of the property (Multnomah County 2017). The sites considered for the second units are close to public transit, schools, grocery stores, and day care, and the formerly homeless families receive full support from social services. The government's cost to build the second unit is about \$75,000, about the same as the cost to convert a garage into a second unit, and about one-fifth of the average \$372,000 per unit it costs to build subsidized affordable housing in California (J. Brown 2017, 118).

If a city wants to provide housing for homeless families, subsidizing second units can be cheaper than subsidizing the rent for existing apartments. Unlike rent subsidies, which increase the demand for affordable housing, subsidized second units increase the supply of affordable housing. After five years, homeowners get the second units at no cost.

If an agency is committed to providing shelter for a specific group, subsidized second units can be a cost-neutral or even a less expensive alternative. For example, because the US Department of Veterans Affairs offers a wide array of programs to help homeless veterans, it can also offer to pay for converting garages into housing in exchange for letting veterans occupy the new housing rent-free for a specified period. This offer seems especially appropriate if the homeowner appreciates a veteran's service to the country and if the neighbors approve of (or at least hesitate to publicly oppose) allowing a formerly homeless military veteran to live nearby.

How Much New Housing?

As of 2016, the City of Los Angeles had 484,089 single-family-zoned parcels (City of Los Angeles 2016). A survey from the San Francisco Bay Area found that 31 percent of homeowners had either tried and failed to add a second unit, planned to build one, or would consider building one (Chapple et al. 2011). If Angelenos feel similarly about second units, relaxing off-street parking requirements could lead to converting about 150,000 (31 percent of 484,089) garages into housing.

Garage conversions are not the only source of second units. Freestanding second units and second units carved out within the main house can also be allowed at an address with a limit on the number of on-street parking permits. New houses can also be allowed to have second units. In new housing developments, allowing second units could easily double the number of housing units provided in single-family neighborhoods. Cities that want to increase the supply of affordable housing can simply legalize it.

All Parking Is Political

Diverse interests from across the political spectrum may support reducing the off-street parking requirements for second units if a city limits the number of on-street parking permits allowed at any address with a second unit. Taken together, reforms for both on-street and off-street parking regulations are likely to appeal to important interest groups.

Housing advocates can see that allowing garage conversions will create affordable homes without requiring any subsidy. Property-rights advocates can see that it will increase owners' ability to manage their property. Environmentalists can see that it will reduce energy consumption, air pollution, and carbon emissions. Elected officials can see that it will encourage infill development and reduce traffic congestion without any new taxes. Contractors can see that it will increase investment in new housing. Urban designers can see that unobtrusive micro-apartments will enable people to live at higher density without being overwhelmed by cars. Libertarians can see greater opportunities for individual choice. Older people can see the potential to have on-site housing for caregivers or boomerang children. Opponents of illegal second units can see the potential for cities to legalize or remove these units. Homeowners can see the opportunities for guest quarters or rental income. Potential residents can see the prospect of affordable housing close to their workplace. Across the political spectrum, the left can see that garage conversions provide affordable, mixed-income housing in good neighborhoods while the right can see they are 100 percent capitalist.

Skillful zoning reforms can increase property values without overcrowding the curb, which is consistent with Fischel's hypothesis that the goal of zoning is to maximize

the net worth of homeowners. Homeowners want to see the price of their property go up, not down, and that can lead them to oppose multifamily construction in their neighborhoods. Second units can achieve both higher property values for single-family homes and affordable housing on the same piece of land. If Second Unit Districts are politically feasible, the next step may be to use market-clearing prices rather than quotas to balance the demand and supply for on-street parking permits (Shoup 2011, 462–64; Shoup 2016). If the city spends the resulting permit revenue to improve public services in the districts that allow second units, the combined effects of increased private investment in housing and improved neighborhood public services can further increase the homeowners' net worth.

Conclusion

One goal of city planning is to avoid conflicts before they happen, such as by regulating setbacks, fence heights, signs, and other features of real estate. Off-street parking requirements help to avoid conflicts about on-street parking, but they have serious unintended consequences, one of which is reducing the supply of housing. Garage conversions can increase the supply of housing but off-street parking requirements inhibit converting garages into housing.

Off-street parking requirements put space for cars ahead of housing for people by making it difficult to convert garages into apartments. We recommend two reforms to reduce the financial and political barriers to converting garages into apartments. The first—allowing tandem and uncovered spaces to meet a city's off-street parking requirement—makes garage conversions more physically and financially feasible. The second—limiting the number of on-street parking permits at any address where a garage has been converted to housing—prevents on-street parking congestion and helps make garage conversions politically feasible. By increasing both home values and the supply of affordable housing, these two parking reforms can achieve both individual and collective benefits of converting garages into housing without crowding the curb.

Parking reform for garage conversions can be offered first as a pilot program in one district. If the first district where garage conversions are allowed is successful, the policy can be offered in other parts of the city. Because they offer flexibility and may be adopted on a piecemeal basis, the parking reforms can allow residential districts to implement gradual change at the neighborhood level. The policy can also be expanded to allow other kinds of second units such as new detached structures, additions to the main house, or carve-outs in the main house, such as basement apartments. Parking reform can reduce the barriers to all forms of second units in both old and new housing while removing concerns about on-street parking congestion.

Parking reforms offer a simple solution to encourage the addition of affordable housing while also providing

homeowners with improved choice and opportunities for mortgage financing and home equity loans. While parking regulations will change, other city regulations for second units, particularly building and safety codes, can remain the same. Existing garage conversions can be grandfathered if they are brought up to code, as is often done with other non-conforming land uses. New houses can also be built with second units or designed with garages and other spaces that are ready for conversion to second units.

The most appropriate method of managing on-street parking for houses with second units will depend on the nature of the neighborhood. In older neighborhoods with narrow lots, for example, only one on-street parking permit may be possible for a house with a second unit. In newer neighborhoods with wider lots, several parking permits for a house with a second unit may not crowd the street. Even in the densest neighborhoods with no off-street parking, cities can allow second units such as basement flats if they manage the on-street parking properly. In this way, relatively minor parking reforms can allow homeowners to create second units and adapt the urban landscape to a new future, one garage at a time.

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References

- AARP (American Association of Retired Persons). 2014. "What Is Livable? Community Preferences of Older Adults." http://www.aarp.org/content/dam/aarp/research/public_policy_institute/liv_com/2014/what-is-livable-report-AARP-ppi-liv-com.pdf.
- Andrews, Clinton J., David Hattis, David Listokin, Jennifer A. Senick, Gabriel B. Sherman, and Jennifer Souder. 2016. "Energy-Efficient Reuse of Existing Commercial Buildings." *Journal of the American Planning Association* 82 (2): 113–33.
- Arnold, Jeanne E., Anthony P. Graesch, Enzo Ragazzini, and Elinor Ochs. 2012. *Life at Home in the Twenty-First Century: 32 Families Open Their Doors*. Los Angeles, CA: Cotsen Institute of Archaeology Press.
- Bachman, Daniel, and Akur Barua. 2015. "Single-Person Households: Another Look at the Changing American Family." Deloitte University Press. <https://dupress.deloitte.com/dup-us-en/economy/behind-the-numbers/single-person-households-and-changing-american-family.html>.
- Been, Vicki, Benjamin Gross, and John Infranca. 2014. "Responding to Changing Households: Regulatory Challenges for Micro-Units and Accessory Dwelling Units." What Works Collaborative white paper. NYU Furman Center, New York.
- Ben, Moselle, ed. 2014. *2014 National Building Cost Manual*. Carlsbad, CA: Craftsman Book.
- Bertolet, Dan. 2017. "Some Neighborhoods Losing Population, Despite the Boom." Sightline Institute. <http://www.sightline.org/2017/05/04/some-neighborhoods-losing-population-despite-the-boom/>.
- Brown, Jerry. 2017. "Governor's Budget Summary 2017-18: Housing and Local Government." <http://www.ebudget.ca.gov/2017-18/pdf/BudgetSummary/HousingandLocalGovernment.pdf>.
- Brown, Martin John, and Taylor Watkins. 2012. "Understanding and Appraising Properties with Accessory Dwelling Units." *Appraisal Journal* 80 (4).
- California Assembly. 2016a. AB-2299: Land Use: Housing: 2nd Units.
- California Assembly. 2016b. AB-2406: Housing: Junior Accessory Dwelling Units. 2015-2016.
- California Housing Finance Agency. 2017. Homeownership Program Bulletin #2017-03.
- California Senate. 2016. SB-1069, Land Use: Zoning.
- California Senate. 2017. SB-35, Planning and Zoning: Affordable Housing.
- Chapple, Karen. 2014. *Planning Sustainable Cities and Regions: Towards More Equitable Development*. London: Routledge.
- Chapple, Karen, Jake Wegmann, Alison Nemirow, and Colin Dentel-Post. 2011. "Yes in My Backyard: Mobilizing the Market for Secondary Units." University of California, Berkeley Center for Community Innovation.
- Chavez, Stephanie, and James Quinn. 1987. "Substandard Housing: Garages: Immigrants In, Cars Out." *Los Angeles Times*. http://articles.latimes.com/1987-05-24/news/mn-2558_1_one-car-garage.
- Chicago Department of Transportation. 2017. "Driveway Permits—Overview and Policy." https://www.cityofchicago.org/city/en/depts/cdot/supp_info/driveway_permits/overview_and_policy.html.
- City of Azusa. 2016. "Illegal Garage Conversions." <http://www.ci.azusa.ca.us/986/Illegal-Garage-Conversions>.
- City of Berkeley. 2015. Ordinance No. 7,445-N.S. Berkeley, CA.
- City of Beverly Hills. 2013. "2014-2021 Housing Element." <http://www.beverlyhills.org/cbhfiles/storage/files/6501624671112595597/BHHousingElementwmaps.pdf>.
- City of Eugene. 2016. "Residential Parking Permit Rates. Planning and Development."
- City of Hermosa Beach. 2015. "Driveway Permits." <http://www.hermosabch.org/index.aspx?page=224>.
- City of Lawndale. 2016. "Lawndale Municipal Code 8.80.040 Application." http://qcode.us/codes/lawndale/?view=desktop&topic=8-8_80-8_80_040.
- City of Los Angeles. 2016. "Department of City Planning Code Studies Division." May 26, 2016.
- City of Los Angeles. 2017. Los Angeles Municipal Code Sec. 80.58 Preferential Parking Program.

- City of Portland. 2016. "Accessory Dwelling Units (ADUs). Development Services." <https://www.portlandoregon.gov/bds/36676>.
- City of Santa Cruz. 2015. "ADU Zoning Regulations. Santa Cruz Planning Department." <http://www.cityofsantacruz.com/home/showdocument?id=8862>.
- Durning, Alan. 2013. *Unlocking Home: Three Keys to Affordable Communities*. Sightline Institute.
- Fannie Mae. 2016. *Accessory Unit and Boarder Income Flexibilities*.
- Fannie Mae. 2017. *Selling Guide: B4-1.3-05: Improvements Section of the Appraisal Report*.
- Fischel, William. 2015. *Zoning Rules! The Economics of Land Use Regulation*. Cambridge, MA: Lincoln Institute of Land Policy.
- Fischel, William A. 2000. "Zoning and Land Use Regulation." *Encyclopedia of Law and Economics* 2:403–23.
- Fry, Richard. 2013. "A Rising Share of Young Adults Live in Their Parents' Home." Pew Research Centers Social Demographic Trends Project RSS. *Pew Social Trends*, August 1, 2013. Web. 18 Mar.
- Glaeser, Edward L. 2011. *Triumph of the City*. New York: Penguin Books.
- Glionna, John M. 2002. "Novelist Spurs Passion Over Parking." *Los Angeles Times*. <http://articles.latimes.com/2002/may/08/local/me-steel8>.
- Gyourko, Joseph, Albert Saiz, and Anita Summers. 2008. "A New Measure of the Local Regulatory Environment for Housing Markets: The Wharton Residential Land Use Regulatory Index." *Urban Studies* 45 (3): 693–729.
- Hofmann, Michelle. 2003. "New Law on In-Laws." *Los Angeles Times*, October 12, 2003. <http://articles.latimes.com/2003/oct/12/realestate/re-inlaw12>.
- Hsieh, Chang-Tai, and Enrico Moretti. 2017. "Housing Constraints and Spatial Misallocation." National Bureau of Economic Research Working Paper 21154.
- Joint Center for Housing Studies of Harvard University. 2013. "America's Rental Housing: Evolving Markets and Needs." Cambridge, MA: Joint Center for Housing Studies of Harvard University.
- Lens, Michael C., and Paavo Monkkonen. 2016. "Do Strict Land Use Regulations Make Metropolitan Areas More Segregated by Income?" *Journal of the American Planning Association* 82 (1): 6–21.
- Los Angeles Department of Transportation. 2017. "Parking Permits." <http://ladot.lacity.org/what-we-do/parking/parking-permits>.
- Los Angeles Times. 2017. "Mapping LA Neighborhoods." <http://maps.latimes.com/neighborhoods/>.
- Lundquist, Ryan. 2012. "How Do Garage Conversions Impact Property Value?" *Sacramento Appraisal Bog*, July 24. <http://sacramentoappraisalblog.com/2012/07/24/how-do-garage-conversions-impact-property-value/>.
- Manville, Michael. 2016. "Bundled Parking and Vehicle Ownership: Evidence from the American Housing Survey." *Journal of Transport and Land Use* 10 (1): 27–55.
- Metropolitan Transportation Commission. 2012. *Survey of Bay Area Cities' Parking Requirements: Summary Report*. MTC Smart Growth Technical Assistance: Parking and Reform Campaign. Oakland, CA: MTC.
- Mukhija, Vinit. 2014. "Outlaw In-Laws: Informal Second Units and the Stealth Reinvention of Single-Family Housing," in *The Informal American City: Beyond Taco Trucks and Day Labor*, edited by Vinit Mukhija and Anastasia Loukaitou-Sideris, 39. Cambridge, MA: MIT Press.
- Mukhija, Vinit, Dana Cuff, and Kimberly Serrano. 2014. *Backyard Homes & Local Concerns: How Can These Concerns Be Better Addressed?* Los Angeles, CA: cityLAB, UCLA Department of Architecture and Urban Design.
- Multnomah County. 2017. "A Place for You." <https://multco.us/dchs/a-place-for-you>.
- Orange County Registrar. 2007. "Young Father Dies in Garage Fire." *Orange County Registrar*. <http://www.ocregister.com/2007/01/30/young-father-dies-in-garage-fire/>.
- Pearl Remodeling. 2016. "Garage Conversion Costs." <http://www.pearlremodeling.com/>.
- Pollard-Terry, Gayle. 2006. "You Got a Permit for That Addition, Right?" *Los Angeles Times*, September 17. <http://articles.latimes.com/2006/sep/17/realestate/re-scofflaw17>.
- Reyes-Velarde, Alejandra. 2015. "Counterpoint: Alumni Perspective on 'Informal Cities.'" June 11. <http://luskin.ucla.edu/news/school-public-affairs/counterpoint-alumni-perspective-informal-cities>.
- Shoup, Donald. 2016. "Parking Benefit Districts." *ACCESS Magazine* 49 (Fall): 35–37.
- Shoup, Donald. 2011. *The High Cost of Free Parking*. Chicago: Planners Press Chicago.
- Thaler, Richard H., and Cass R. Sunstein. 2008. *Nudge: Improving Decisions about Health, Wealth, and Happiness*. New Haven, CT: Yale University Press.
- US Census Bureau. 1980. Decennial Census.
- US Census Bureau. 1990. Decennial Census.
- US Census Bureau. 2000. Decennial Census.
- US Census Bureau. 2015. 2011–2015 5-Year American Community Survey.
- US Department of Housing and Urban Development (HUD). 1985–2013. Components of Inventory Change (CINCH) Reports.
- US Department of Housing and Urban Development (HUD). 2015. "State of the Cities Data Systems: Building Permit Data 1980–2015."
- Value Penguin. 2017. "Average Cost of Homeowners Insurance (2017)." <https://www.valuepenguin.com/average-cost-of-homeowners-insurance#nogo>.
- Wegmann, Jake. 2014. "'We Just Built It': Code Enforcement, Local Politics, and the Informal Housing Market in Southeast Los Angeles County." PhD diss., City and Regional Planning, University of California, Berkeley.
- Wegmann, Jake. 2015a. "Financing Ancillary Apartments on Residential Properties: Challenges and Solutions." Institute of Governmental Studies, University of California, Berkeley.
- Wegmann, Jake. 2015b. "Research Notes: The Hidden Cityscapes of Informal Housing in Suburban Los Angeles and the Paradox of Horizontal Density." *Buildings & Landscapes: Journal of the Vernacular Architecture Forum*.
- Wegmann, Jake, and Sarah Mawhorter. 2017. "Measuring Informal Housing Production in California Cities." *Journal of the American Planning Association* 83 (2): 119–30.

- Willson, Richard W. 2013. *Parking Reform Made Easy*. Covelo, CA: Island Press.
- Wood, Colin. 2014. "City Parking Enforcement Goes Paperless." *Government Technology*, April 22. <http://www.govtech.com/public-safety/License-Plate-Scanning-Goes-Mobile.html>.
- Zillow. 2015. "Renting Less Affordable Than Ever before, While Mortgages Remain Affordable, by Historical Standards." <http://zillow.mediaroom.com/2015-08-13-Renting-Less-Affordable-Than-Ever-Before-While-Mortgages-Remain-Affordable-by-Historical-Standards>.
- ZoningDC. 2016. "Zoning Commission Unanimously Approves ZRR!" *ZoningDC*, January 15. <http://zoningdc.org/2016/01/15/zoning-commission-unanimously-approves-zrr/>.

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