

Los Angeles' Housing Crisis and Local Planning Responses: An Evaluation of Inclusionary Zoning and the Transit-Oriented Communities Plan as Policy Solutions in Los Angeles

Linna Zhu
Urban Institute

Evgeny Burinskiy
University of Southern California Sol Price School of Public Policy

Jorge De la Roca
University of Southern California Sol Price School of Public Policy

Richard K. Green
University of Southern California Sol Price School of Public Policy,
Marshall School of Business, and Lusk Center for Real Estate

Marlon G. Boarnet
University of Southern California Sol Price School of Public Policy

Abstract

Los Angeles has a housing crisis. As a result, in 2016, Los Angeles County voters passed a local ballot measure, Measure JJJ, which created a new inclusionary zoning program near rail transit stations. That program has since performed substantially better, in terms of building permits and time for review, than the previously existing density bonus program. In this paper, the authors will present two analyses. First, evidence indicates that the inclusionary zoning program that flowed from Measure JJJ (called Transit Oriented Communities, or TOC) resulted in almost as many building permits over its shorter life than the longer-lived density bonus program. Second, detailed financial analyses of a hypothetical new residential development across a range of neighborhoods in Los Angeles demonstrate that the combination of density increases and affordability requirements in the TOC program is financially more attractive than exclusively market-rate development in many of the same neighborhoods that saw the largest use of the TOC program. The authors conclude that the TOC program can be a successful method of inclusionary zoning, and they draw policy lessons that can apply elsewhere.

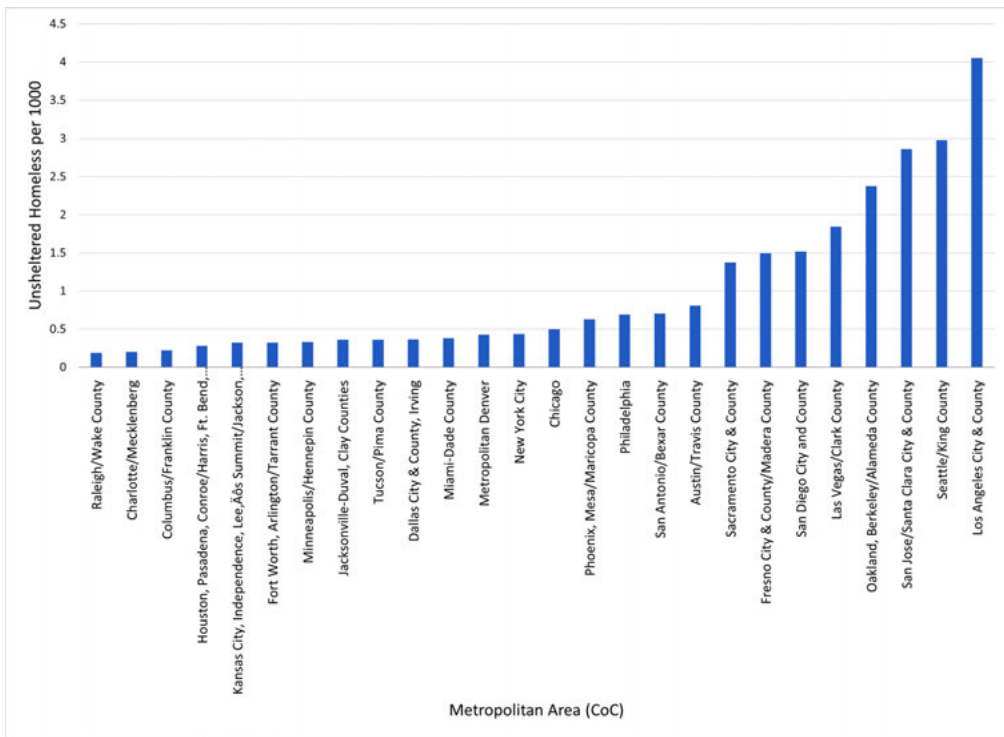
Introduction

The Affordability Crisis in Los Angeles

By every available measure, Los Angeles performs badly concerning housing. The most visible housing failure in Los Angeles involves homelessness in general and unsheltered homelessness in particular. The area’s Continuum of Care geography, which almost entirely overlaps Los Angeles County, has by far the largest per capita unsheltered homeless population in the United States (exhibit 1).¹

Exhibit 1

Homelessness Rates Across Metropolitan Statistical Areas



CoC = Continuum of Care.

Sources: U.S. Department of Housing and Urban Development 2018 Point in Time Estimates of Homelessness in the U.S. and authors' calculations

Underlying this dismal performance is a housing market that is among the most expensive—relative to income—of any in the nation. Although homelessness has many sources, expensive housing is among them (Quigley and Raphael, 2004). Consider where Los Angeles ranks in terms of how much an individual at the 25th percentile of the renter income distribution would have to pay for a rental unit at the 25th percentile of the gross rent distribution. Among the 50 largest

¹ Authors' calculations of U.S. Department of Housing and Urban Development 2018 point in time estimates of homelessness in the United States (<https://www.hudexchange.info/resource/5783/2018-ahar-part-1-pit-estimates-of-homelessness-in-the-us/>).

metropolitan statistical areas (MSAs), Los Angeles ranks as the ninth worst² in affordability, with a 25th-percentile rent to 25th-percentile income ratio of 53 percent.³

A household at the 25th percentile of the renter income distribution in Los Angeles County earns \$24,000 per year.⁴ Using the standard measure of affordability (i.e., households should not spend more than 30 percent of their income on rent), a household at the bottom quartile can afford to spend \$7,200 per year, or \$600 per month, on rent.⁵ However, American Community Survey (ACS) data show that Los Angeles County has 151,000 units with gross rent of less than \$600 per month and 462,000 households with incomes of \$24,000 or less. These estimates mean that, at a minimum, Los Angeles County has 311,000 fewer housing units than it needs to affordably house people at the bottom quartile of the rental distribution.

Doing the same exercise at the median, the median renter household in Los Angeles County has an income of \$50,000. Using the same standards as before, the median renter can afford a rent of \$1,250 per month. The county has 670,000 units with rents at \$1,250 and below, and it has 925,000 households at the median or below. These estimates show the county is 255,000 units short of what those at the median need. Hence, again at a minimum, Los Angeles County is currently short 566,000 units that households can afford using the 30-percent standard.

Inadequate Housing Supply

Before examining the city's Transit-Oriented Communities (TOC) program, it is important to document how much of the housing problem in Los Angeles is indeed a supply problem by assessing three dimensions: vacancy, overcrowding, and new construction.

Los Angeles has the second lowest vacancy rate of any MSA in the United States (exhibit 2).⁶ Although the housing in Los Angeles could be better matched to the needs of Los Angeles households (the area has plenty of bedrooms and floor space, but much of it is concentrated in relatively few houses), housing in Los Angeles is not going to waste. Some advocates have embraced the idea of a vacancy tax in Los Angeles, but it would have little effect.

² Authors' calculations of 2018 one-year American Community Survey (ACS) data.

³ The Los Angeles MSA includes the more affluent Orange County. When excluding Orange County from the analysis, the affordability ratio in Los Angeles remains high at 53 percent. Orange County has higher incomes than Los Angeles County, but has higher rents, making it just as unaffordable.

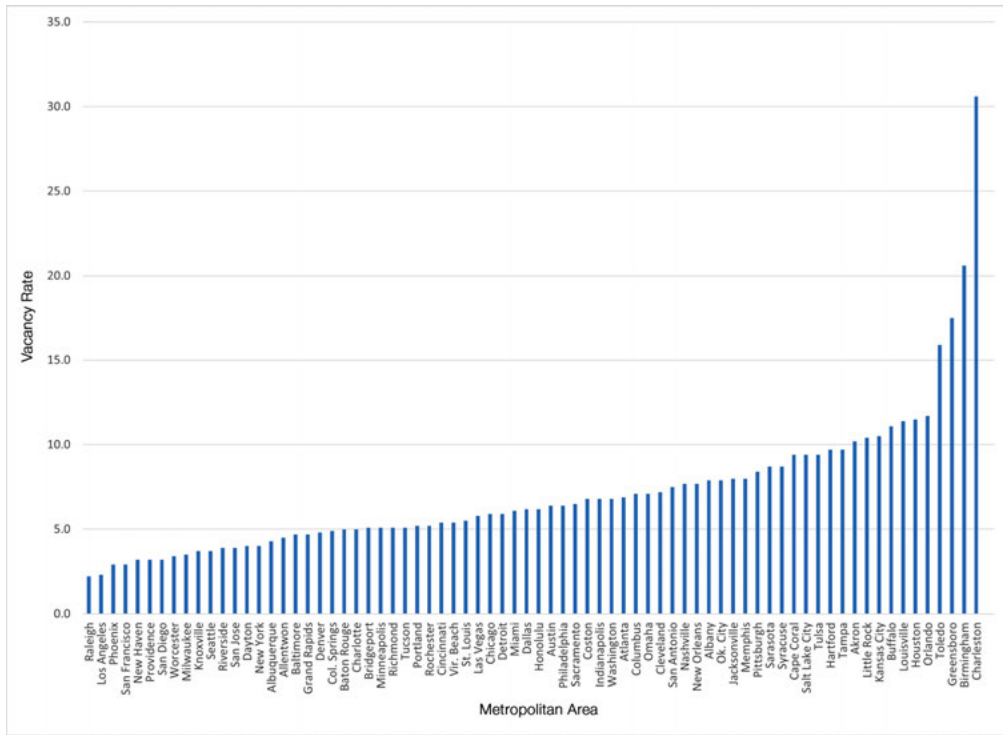
⁴ For a discussion using quintiles as affordability measures, see Schwartz et al. (2016).

⁵ Such units qualify as Naturally Occurring Affordable Housing (Urban Land Institute, 2016).

⁶ Authors' calculation of 2020 Q1 U.S. Current Population Survey Housing Vacancies and Homeownership historical tables (<https://www.census.gov/housing/hvs/data/histtabs.html>).

Exhibit 2

Vacancy Rates Across Metropolitan Statistical Areas, First Quarter 2020



Source: U.S. Current Population Survey Housing Vacancies and Homeownership Report, First Quarter 2020

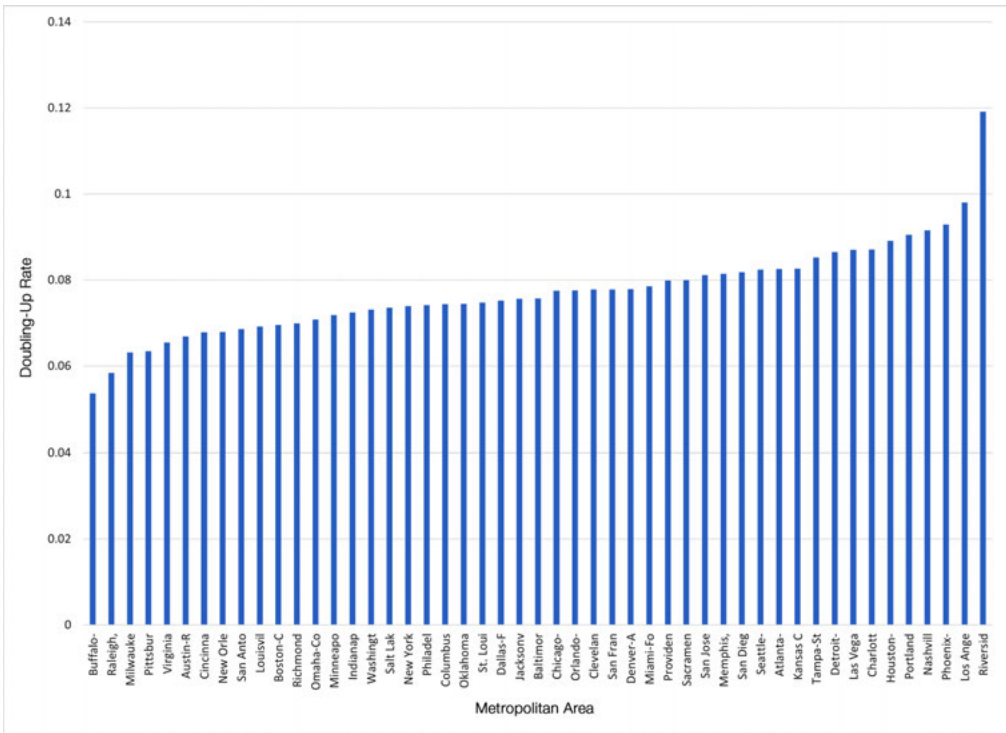
The effect of vacancy on rent was first modeled formally by Rosen (1974). The University of Southern California (USC) Lusk Center for Real Estate uses Rosen’s modeling technique to determine the “natural” vacancy rate (i.e., the rate at which inflation-adjusted rents neither rise nor fall). The Lusk Center model estimates that the natural vacancy rate for Los Angeles County is 5 percent, or 2.8 percentage points higher than it currently is. That vacancy rate implies that the county needs to build about 56,000 multifamily units to prevent multifamily real rents from rising further.

Second, by one measure, Los Angeles is among the most overcrowded of MSAs. Considering subfamily (or doubling up) rates among renters by MSA, Los Angeles is second only to its neighbors in the Inland Empire—a metropolitan area immediately inland of Los Angeles (exhibit 3)⁷. This high doubling up rate is yet another indicator of insufficient housing supply. The Los Angeles Metropolitan area has a rate of doubling up 2 percentage points higher than the average of the 50 largest MSAs. The rate is even 2.8 percentage points higher in Los Angeles County.

⁷ Authors’ calculations of 2018 1-year American Community Survey (ACS) data.

Exhibit 3

Doubling-up Rates Across Metropolitan Statistical Areas



Source: Authors' calculations of 2018 1-year U.S. Census American Community Survey Data via IPUMS

Finally, considering new construction, Los Angeles has among the worst performances of any MSA in the United States. Over the past 5 years, the nation has permitted one housing unit for every 1.8 jobs added. The Los Angeles MSA has permitted just one unit per 3.2 jobs, meaning that, relative to job growth, Los Angeles is building 44 percent more slowly than the nation. In 2019, the Los Angeles metropolitan area permitted 30,554 housing units of all types, a small uptick from 2018 but also considerably lower than in 2015 (permitting activity in the metropolitan area declined every year from 2015 through 2018 before the small rise in 2019). Los Angeles County permitted 21,500 units in 2019, of which 15,600 were multifamily units. Even with no increase in housing demand and no demolitions, the number of planned multifamily buildings is insufficient to alleviate rent increases.

Voter Response to the Los Angeles Housing Crisis

In response to these severe housing issues, the voters of Los Angeles in 2016 passed three housing-related initiatives: Measure H, Proposition HHH, and Measure JJJ. Measure H raised the sales tax throughout Los Angeles County by 0.25 percent for the specific purpose of funding homeless services and short-term shelters. Proposition HHH was a City of Los Angeles initiative that allowed the city to use bond funding to pay for supportive housing and build “10,000 units for homeless

Angelinos.” To date, evaluating the effectiveness of those measures is hard—only 47 HHH units have come online. Over the years since voters approved H and HHH, homelessness has risen sharply in Los Angeles (Los Angeles Homeless Services Authority, 2020).

Measure JJJ was different in that it tackled the issue of Los Angeles’ in-place zoning, which prevented dense construction in vast swaths of the city. Measure JJJ had two parts. The measure required that developments needing a new entitlement (a zoning change or an amendment to the general plan) build affordable housing or pay an in-lieu fee. To this point, the upshot of this feature of Measure JJJ has been to substantially reduce the number of requests for re-zonings or amendments to the general plan. Los Angeles’ zoning code has only been revised piecemeal in the past several decades and has been subject to down zonings that have reduced its zoned capacity by more than one-half since 1960 (Morrow, 2013: 3). As a result, the city’s zoning code is incompatible with the market pressures that have arisen with the doubling of Los Angeles’ population since 1960.

Measure JJJ had another noteworthy feature, however. The measure required the city’s planning department to develop a by-right inclusionary zoning (IZ) program, the TOC program. Under that program, developers received by-right development rights to build more densely near designated transit stations than zoning allowed before Measure JJJ in exchange for providing affordable housing. Specifically, Measure JJJ increases the allowable floor area ratio (FAR) in transit-rich areas. Different levels of transit richness, as defined by the city, allow for different FARs. To give a specific example of how it works, a parcel that under current zoning has a FAR of 1.5—meaning that for every 1,000 square feet of land, a developer is, by right, permitted to build 1500 square feet of floor area. If the developer received a density bonus (DB) of 50 percent (which is one of the TOC allowances levels), the FAR would increase to 2.25, meaning that the developer would be permitted to produce 2,250 square feet of floor space for every 1,000 square feet of land.

This Article’s Contribution

This article investigates the value proposition to developers of a FAR or density increase. On the one hand, increasing FAR means that developers may reduce their land cost per housing unit. Land in Los Angeles is, by national standards, expensive, so reducing land costs is key to reducing the total construction costs for new units. On the other hand, affordability requirements mean that developers lose rental revenues, relative to the market, on some of the units that they build. Therefore, a developer will compare the internal rate of return (IRR) for a project that has more units but with affordability restrictions to the IRR for a project that contains fewer units but has no such affordability restrictions.

The main analysis performs financial calculations using development proformas of TOC projects’ feasibility in different parts of the city. Different construction cost estimates, land values, development fees, and rents are used to compute the IRRs for non-TOC and TOC projects across Los Angeles. The analysis is limited to eligible areas for the TOC program and model differences in TOC allowances. TOC allowances are functions of transit richness—for example, a parcel near a local bus stop is eligible for TOC, yet it receives a density bonus that is smaller than a property near a Los Angeles Metro rail line.

The financial simulations on the TOC program's feasibility suggest that in several markets in Los Angeles, developers would prefer to build some affordable units in exchange for FAR rather than 100-percent market-rate development. The financial simulations match the observed construction patterns of TOC projects. More specifically, developers find building TOC units in moderate-to-low markets more attractive compared to moderate-to-strong markets. Developers take advantage of the lower construction costs in less affluent markets because such markets tend to have three- to four-story buildings constructed from wood. Furthermore, developers find building 100-percent market-rate projects in moderate-to-strong markets more attractive. This pattern flips in very affluent neighborhoods. In expensive neighborhoods, the cost savings from using less land per unit exceed the income losses from the required affordable units.

The TOC program's empirical assessment in this article supports the findings of the financial simulations and provides insights into additional benefits for developers. Analysis of TOC building permits and entitlements suggests that developer takeup of the TOC program is indeed high. Despite being a recent program, TOC projects have entitled and approved almost as many affordable units as the comparable but longer running DB program. This high takeup is consistent with our financial simulations that suggest that developers should prefer, in some instances, the TOC program to pure market-rate development. However, the entitlement data show an added benefit not captured by our simulations: decreased entitlement costs and risks. The TOC program provides a tenable solution by allowing for by-right and expedited discretionary entitlement processes, which enable developers to eschew the risky and lengthy process of entitling a project.

One feature of TOC projects is that developers can tradeoff between the depth of affordability and the share of required affordable units. In general, we find that developers earn higher returns by catering to extremely low-income households, given that the difference in rent between the income tiers is not as crucial to determining returns as the difference in units set aside for affordable housing. The main factor that affects the feasibility of inclusionary housing programs is the affordability share. The proforma analyses show that land values and market rents are quantitatively small in their influence on project profitability. Regarding affordability tiers, projects that provide affordable units to extremely low-income households exhibit a much higher IRR than projects that target low-income households.

The Los Angeles TOC program is critical both as one of the most high-profile affordable housing tools in the nation's second largest city and as an example of density bonus programs that trade increased FAR for affordable units. The simulations and data inspections in the article suggest that the TOC program has provided the right type of balance to incentivize private construction of affordable units without giving developers a windfall. However, despite the growing popularity of TOC projects, it is unlikely that TOCs alone will solve the housing supply crisis in Los Angeles.

The article proceeds as follows. The background section follows this introduction and sets out the motivation behind inclusionary zoning programs in Los Angeles City and summarizes the main guidelines. The next section discusses the empirical evidence of TOC efficacy and the empirical patterns to calibrate the financial analysis. The fourth section of the article presents the findings of the TOC program's financial simulation. The final section concludes with policy implications of the TOC program's financial and empirical assessments regarding the larger housing problem in Los Angeles.

Background: Affordable Housing and Inclusionary Zoning Policies in Los Angeles

Affordable Housing in California

The affordable housing crisis in Los Angeles is severe, but affordable housing shortages exist nationwide. Estimates are that subsidized affordable housing provides enough units to house approximately 30 percent of the households in need of housing, defining need as households who would pay more than 30 percent of their income on housing absent affordability subsidies (as cited in Bostic and Orlando, 2016). Of the remaining 70 percent of households who cannot obtain subsidies, about one-half (35 percent of the total) can find housing that is “naturally occurring” affordable—market-rate housing that does not cost burden the household (Boarnet et al., 2017a). Hence nationwide, approximately one-third of the households in need of affordable housing cannot obtain either a subsidized unit or a naturally occurring affordable unit—a gap estimated at approximately 6 million households in the United States (Boarnet et al., 2017b). While sub-national estimates are not readily available, the gap is likely more concentrated in high-cost housing areas, including California’s major cities.

Over the past four decades, responsibility for responding to affordable housing needs has shifted from national to local governments. The federal government has traditionally provided affordable housing support both in the form of programs that increase supply (supply-side programs) and programs that supplement consumer income for housing (demand-side programs.) Supply-side programs include public housing and the low-income housing tax credit (LIHTC) designed to incentivize private development of affordable housing. The primary federal demand-side program is the Section 8 affordable housing voucher, which provides funds that income-eligible households can use to pay rent.⁸

Since the early 1980s, funding for both federal housing programs has consistently declined relative to need. As a result, only an estimated 30 percent of income-eligible households can obtain federal housing assistance through a Section 8 voucher or an affordable unit in public or LIHTC housing. As the federal government has withdrawn from affordable housing policy, states and cities have tried to fill the gap.

In California, voters have passed bonds to borrow funds to increase funding for affordable housing at the state level. In 2018, California voters passed Proposition 1, which allows the state to borrow \$4 billion to fund affordable housing. News outlets estimate that the funds can help 55,000 families (Lagos, 2018). However, suppose that unmet affordable housing needs in California are proportional to those in the United States. In that case, California has an estimated 720,000 households in need of affordable housing who cannot find either subsidized or market-rate affordable units. While that number likely underestimates affordable housing needs in the state, Proposition 1 can serve about 7.5 percent of that estimated need. As is typical in many places, state activity, while welcomed, is not sufficient to fill the gap left by the declining federal presence in affordable housing.

⁸ See Schwartz (2010) for a description of the federal role in affordable housing.

Inclusionary Zoning Programs in Los Angeles

As federal and state efforts have proven insufficient, cities have worked to fill the gap and address affordable housing needs. One of the primary tools of city-level affordable housing policy is IZ. In a typical IZ program, a developer seeking approval for a market-rate rental complex would be either required or incentivized to set aside a fraction of units with rents below market rate to provide affordable units in return for increased development density. The prevalence of IZ programs across major metropolitan areas and their effects vary widely based on the applicable affordability share, the targeted income levels, and the duration of affordability (Schuetz, Meltzer, and Been, 2009).

Some scholars and planning professionals have raised concerns that IZ programs do not incentivize many affordable units. They claim that the increased FAR allowances are insufficient to make a dent in demand. Schuetz, Meltzer, and Been (2011) found evidence that IZ programs had a relatively small effect on the number of affordable units in selected markets, such as San Francisco, Washington, D.C., and suburban Boston.

This article examines the financial feasibility of the TOC program. The TOC program is an IZ program designed by the Los Angeles Department of City Planning to improve previous IZ efforts to develop affordable housing. Both the DB (the predecessor to the TOC) and TOC programs are described briefly below.

Density Bonus Program

The city's DB program (City Ordinance No. 179681), introduced in 2008, is an implementation of California law. Development projects that include affordable units can qualify for additional density levels and development incentives. The structure of the program follows several tiers. For example, projects that set aside 5 percent of their units for very low-income (30 percent or less of area median income, AMI) or 10 percent of units for low-income households (between 30 percent and 50 percent of AMI) qualify for a 20-percent increase in density. Other incentives are also available (such as reductions in the setback or increase in FAR), based on the number of affordable units provided.

Transit-Oriented Communities Plan

The TOC plan, developed in 2017 as required by the voter-approved Measure JJJ, is in many ways a density bonus program focused near transit stations, with higher affordability requirements and larger incentives. There are several tiers within the TOC guidelines corresponding to the service level and access capacities of transit stations. The density increases and requirements for affordable units vary across these tiers. For example, the TOC allows that development projects within one-half-mile of rail stations get a density increase of 70 percent if 10 percent of the housing units are affordable to households earning 30 percent or less of AMI. The standard TOC program also allows the developer to build By-Right projects (i.e., eschew the lengthy and risky discretionary approval process). Moreover, the developer can decide to go through the discretionary entitlement process when applying for additional perks such as reduced setbacks. The main guidelines of the two programs are described in exhibit 4 below.

Exhibit 4

Comparison of Los Angeles Affordable Housing Programs

Housing Policy	Density Implications		Affordability Implications		Other Entitlement Implications	
	Minimum	Maximum	Minimum	Maximum	Reductions in Parking Requirements (per du)	Other Entitlement Variances Permitted
Density Bonus Program (City Ord. No. 179681)	20%	35%	10% for LI or 5% for VLI	20% for LI or 11% for VLI	See ordinance for details	Setback + lot width reductions, lot coverage + FAR increases
Transit-Oriented Communities (Measure JJJ)*	50% (35% in restricted density zone)	80% (45% in restricted density zone)	20% for LI or 11% for VLI or 8% for ELI	25% for LI or 15% for VLI or 11% for ELI	For Tiers 1-3, 0.5 spaces or 0 spaces if 100% affordable units For tier 4, 0 spaces	Minimum FAR increase of 40% or at least 2.75:1 in commercial Maximum FAR increase of 55% or at least 4.25:1 in commercial

AMI = area median income. du = dwelling unit. ELI = extremely low income. FAR = floor area ratio. LI = low/lower income. VLI = very low income.
 *For the TOC Program, Minimums and Maximums correspond to Tiers 1 and 4 of the Program, respectively.
 Notes: ELI households earn less than 30 percent AMI; VLI households earn less than 50 percent of AMI; LI households earn less than 80 percent of AMI.
 Sources: For Density Bonus program: City of Los Angeles Ordinance 179681, amending Los Angeles Municipal Code §§ 12.22, 12.24, 14.00, and 19.01 (2008). https://planning.lacity.org/odocument/e811b5a6-294b-474e-accb-064cb8a4eb4f/DB_Ord.pdf. For Transit-Oriented Communities program: Transit Oriented Communities Affordable Housing Incentive Program Guidelines (TOC Guidelines), added to Los Angeles Municipal Code § 12.22 A.31 (2018). <https://planning.lacity.org/ordinances/docs/toc/TOCGuidelines.pdf>

Transit-Oriented Communities Takeup

This study uses building permit and entitlement data provided by the City of Los Angeles to establish empirical facts on TOC’s takeover to provide context for the financial simulations. The key takeaways from the empirical analysis are as follows. TOC permits seem to have generated a lot of developer interest; despite the program’s recent inception, its takeover in terms of number of permits and units provided by TOC has caught up with older programs, such as the city’s DB program. This high takeover may be due to numerous reasons, as revealed in the data and financial simulations. TOC permits are, by design, by-right permits, suggesting that developers going through the TOC permits can eschew the lengthy and risky entitlement process. Even if a developer does not take the TOC permit as is, however, but seeks additional program benefits—which puts the developer through the entitlement process—entitling a TOC project still takes less than one-half the time of a regular DB project. As a result, aside from generating project-related profits, the TOC programs’ takeover has yielded cost-saving and risk-reducing incentives. Another key empirical fact is that TOC projects tend to provide extremely low-income units primarily in lower-income neighborhoods—a difference from the pre-existing DB program in Los Angeles.

Data Description

The source data register entitlement and building permit information on projects with DB and TOC permits. Data on building permits with TOC and DB projects current through April 23, 2020, were provided by the Los Angeles Department of City Planning (LADCP). The data enumerate projects and the number of affordable and market-rate units at various project approval stages. Besides, the TOC building permits data distinguish between by-right and discretionary projects. The annual progress reports (APRs) from LADCP provide the total number of units by affordability tier that received building permits.

Several steps were followed to operationalize the data. For both TOC and DB projects, only new building projects were considered, excluding rehabilitation and other project types. In each data set, projects had multiple dates associated with them. When tallying building permits, the year listed corresponds to the year when the building permit was issued; the issue date is consistent with the City of Los Angeles's APRs, which tabulate the issued number of building permits. The year used for proposed entitlements refers to the year when the project was filed, whereas for approved projects, the date used was the year of completion. In each data source, up to nine projects had invalid date entries and were excluded.

Because this study examines the private supply of TOC projects, all projects with a share of affordable units greater than 25 percent were excluded. That cutoff was chosen because TOC rules mandate the maximum share of affordable units to be 25 percent, though, in some instances, the required share is much smaller (such as when providing units for extremely low-income households). For entitlements, a few observations where housing type was unclear or not pertinent were dropped. For example, nonpertinent observations for workforce housing and a few unclear projects with an "affordable" designation or no delineation of affordability tier were removed.

To make sure the counts are representative and accurate, the authors validate the data they received from LADCP against APRs assembled by the state of California's planning commission. There were some minor discrepancies between the raw building permit data and the APRs that were hard to reconcile. Nonetheless, study relies on the best available data on TOC building permits available.

Empirical Patterns

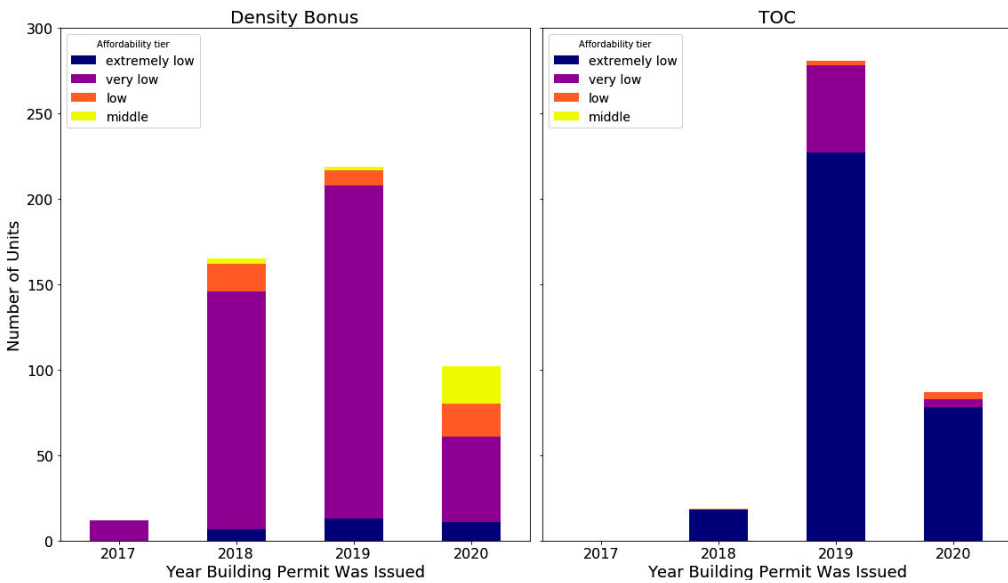
A central element of the TOC program is that it can allow developers to build by-right. Namely, data from Los Angeles Department of Building and Safety (LADBS) suggest that of 464 approved TOC building permits, only 257 went through the entitlement process—that means that 45 percent of developers skip the risky and lengthy entitlement process altogether with the TOC program. However, fifty-five percent of TOC projects still go through the entitlement process, and the data herein suggest why. According to O'Neill, Gaulco-Nelson, and Biber (n.d.), getting a project entitled takes 11 to 22 months on average, with more extended periods for larger projects and an average time of 13 months across all projects in Los Angeles. By contrast, TOC projects take just over 6 months to get approved on average. As a result, even if a developer opts for extra benefits, it still takes about one-half the time of a regular project to get approved. This benefit may have a few outcomes. Because entitlement costs are not insubstantial, cutting entitlement times may make TOC programs less costly to entitle and, hence, more profitable. Moreover, the entitlement process is a risky endeavor, so that a shorter entitlement period may decrease the developer's risks,

thus reducing the uncertainty of the project's profitability. The combination of lower costs and less risk may explain why more TOC developers opt for additional benefits (and go through the entitlement process) than by-right projects.

Building permit data reveal that TOC projects supply primarily extremely low-income housing. Exhibit 5 compares TOC building permits to those of the comparable DB program. Unlike the DB projects that supply mostly very low, low, and middle-income units, TOC projects supply primarily extremely low-income projects. That fact suggests two things. First, the mechanism by which TOC offsets profit losses incurred by providing extremely low-income units works, as evidenced by the large take-up for the program. Second, developers prefer to provide fewer affordable units as a share of total units. The TOC program is designed to be mostly tier-neutral in terms of affordability levels. For example, to provide very low-income units at a tier-4 location, a developer must make 15 percent of units affordable. To provide extremely low-income units, a developer needs only 11 percent of units to be affordable. As a result, Exhibit 5 implies that TOC developers prefer to provide a smaller share of affordable units by offering extremely low-income units.

Exhibit 5

Number of Approved Units for Density Bonus and TOC Affordable Units



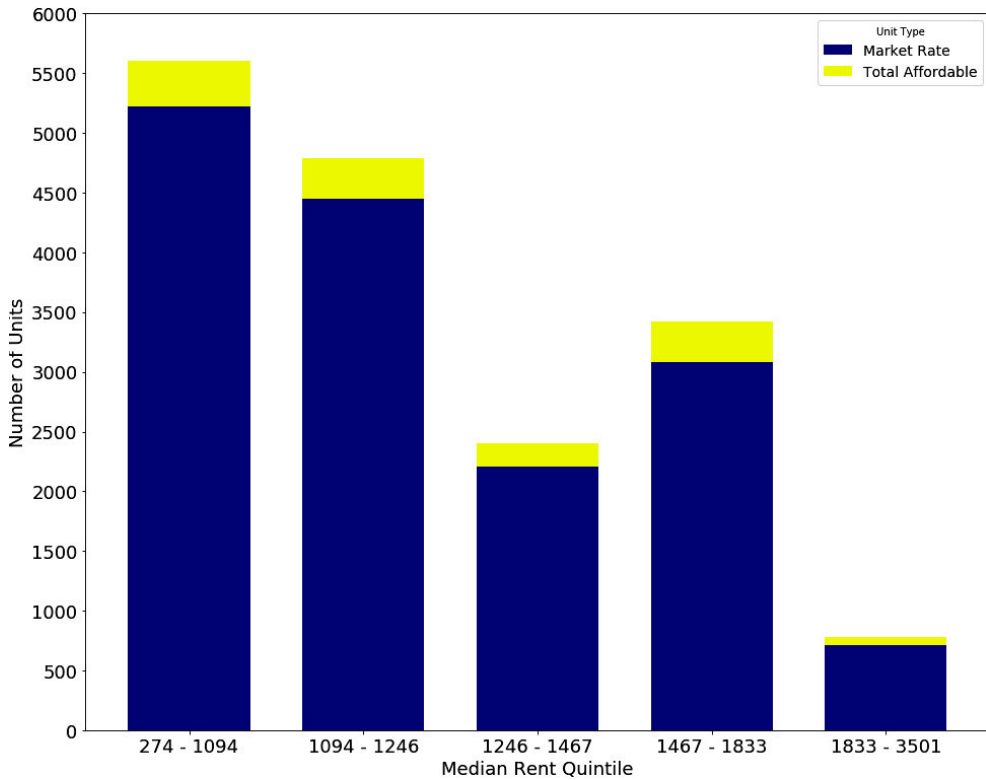
Source: Building Permit data on TOC and DB from LADCP

Exhibit 6 examines the sorting of projects across rent segments. The geocoded addresses in the building permit data are spatially matched to census block groups. Data on median gross rents come from the 2017 American Community Survey (ACS) 5-year data, available at the census block level. Median rents for all census blocks are classified into quintiles. The lowest rent segment pays median monthly rents between \$274 and \$1,094, while the most affluent segment pays much higher rents between \$1,833 and \$3,501. Exhibit 7 shows that developers mainly build projects

that include affordable units in the two lowest rent segments (with median rents below \$1,246). They also tend to build in the second richest rent segment, with rents between \$1,467 and \$1,833. The most affluent rent quintile receives the least number of projects and affordable units.

Exhibit 6

Total Number of Units Approved for TOC Projects by Rent Segment

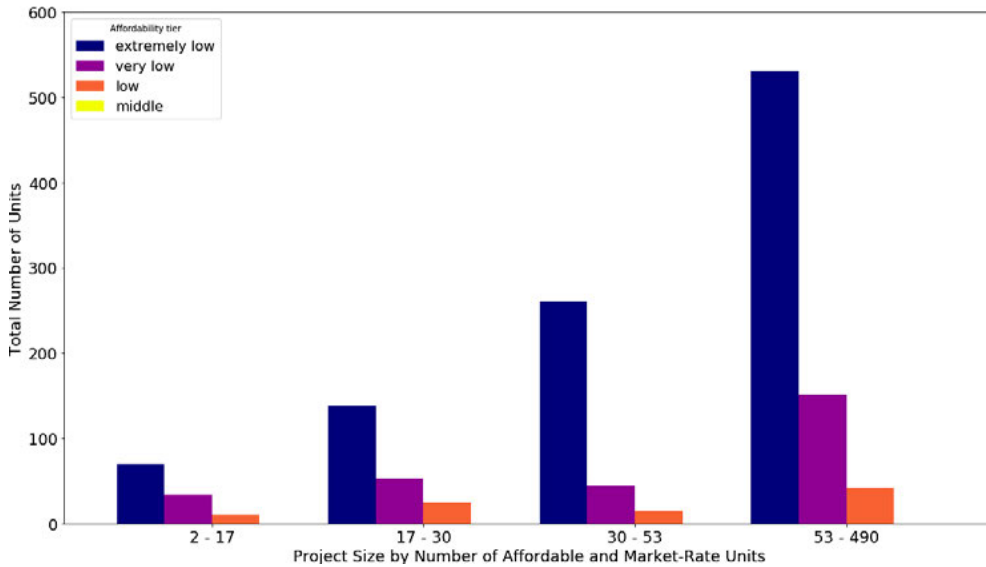


Sources: Building Permit data from LADCP and rent data from 2017 ACS 3-year

Although in the study's financial simulations, projects do not vary by size, the choice of the simulated project size is verified by checking the TOC empirical size distribution. Exhibit 7 shows that larger TOC projects provide the highest number of extremely low-income units. Also, TOC projects in the third quartile of size provide the most extremely low-income units as a share of total units. Of course, this result is not surprising. The number of affordable units is allotted as a share of market-rate units, so larger projects will provide more affordable units. Given the high number of affordable units provided by large projects, we focus our financial simulation analysis on projects of 50+ units.

Exhibit 7

Number of TOC Affordable Units by Project Size



Source: Building permit data from LADBS

Financial Analysis

The TOC affordable housing program seeks to incentivize affordable housing by changing developers' financial payoffs.⁹ How well does it work? More specifically, can the TOC program incentives provide additional developer profit that would make it more likely that developers would choose to participate? This section models a typical developer's decision problem to understand how the tradeoff between increased FAR and increased affordable housing requirements works in the Los Angeles context. On the one hand, increasing FAR means that developers may reduce their land cost per unit. Land in Los Angeles is, by national standards, expensive, so reducing land costs is key to reducing the total construction costs for new units. On the other hand, affordability requirements mean developers lose rental revenues, relative to the market, on some of the units that they build. Therefore, a developer will compare the IRR for a project with more units and affordability restrictions to the IRR for a project with fewer units and no affordability restrictions.

To obtain the IRR under both scenarios, we conduct proforma analysis on a hypothetical new mid-rise multifamily rental building across 20 diverse locations in the city of Los Angeles. A proforma is a document used to organize and forecast cash flows for a rental property. After determining the cash flows, it is possible to calculate the IRR for a project, whereby the higher the IRR, the greater the investment return. Developers in Los Angeles often use 12 percent as the IRR hurdle rate they need to attain for a multifamily project. Thus, most developers will find it an attractive investment

⁹ The analysis here is in the spirit of Collinson, Ellen, and Ludwig (2015).

opportunity if the project delivers an IRR higher than 12 percent. We follow this rule of thumb in the industry and adopt 12 percent as our hurdle rate that determines whether a developer will invest in a project or not.

Without inclusionary housing, our hypothetical multifamily building has 263 market-rate rental units.¹⁰ We assume a typical distribution of apartment types: 20 percent are studios (53 units), 40 percent one-bedrooms (105 units), and 40 percent two-bedrooms (105 units). If a developer decides to participate in an inclusionary housing program, she can trade the right to develop at a higher density in exchange for affordable units. In our analysis, a developer can receive a 65-percent increase in density if she allocates 22 percent of the total units to low-income renters (i.e., those households with earnings between 50 and 80 percent of the AMI).¹¹ As a result, our hypothetical multifamily building has 434 units in total, of which 338 are market-rate, and 95 are low-income units. We then project the rental revenue, development cost, and operating expenses for the project under both scenarios, with and without inclusionary housing. Using a proforma analysis and comparing the IRRs in both settings, we can assess whether it is more profitable for developers to participate in the subsidy program and trade reduced rental revenue in exchange for a much higher number of units.

It is worth noting that we make our financial simulations for new TOC projects and omit project renovations. Before we present our financial analysis findings, we define some terms and discuss the components of the proforma together with some assumptions we make. We provide additional details on the structure of the proforma in an online appendix.

Simulation Parameters

Locations or Neighborhoods

We create 20 locations in the city of Los Angeles that denote neighborhoods. A location is a combination of market rents and land values. To obtain such locations, we first map all TOC permits since 2017 and identify the 209 census tracts that overlay those projects. Using census data, we calculate the average rent across all units in each of the 209 census tracts and create a rent distribution. Since our hypothetical projects are new construction, we adjust values by the observed citywide rent premium for units built after 2014. We then group rents (adjusted to reflect new construction) in the 209 census tracts into 20 categories or quantiles. Those 20 quantiles cover a broad range of neighborhoods and reflect the variation in market conditions across Los Angeles transit station areas. For instance, the lowest quantile has a monthly rent of \$835, the median quantile monthly rent is \$1,786, and the highest quantile has a monthly rent of \$2,915. We provide examples in our analysis that relate these quantiles to Los Angeles neighborhoods such as Boyle Heights, Koreatown, Silver Lake, or Westwood.

¹⁰ Our selected project size is larger than most TOC projects, as less than 10 percent of all projects have more than 100 market-rate rental units. However, they account for one-third of all units that entered the market under the TOC program. Our results are generally invariant to the project's size since we calculate revenues and costs on a per square foot basis. Government fees are an exception as they are not proportional to size.

¹¹ The 65-percent increase in density is the midpoint of the 50 to 80 percent DB ratios across the four tiers in TOC guidelines.

To assign land values for each of these 20 locations, we rely on an online property data set provided by the Los Angeles County Office of the Assessor. This data set contains parcel-level information on the parcel's last sale, estimated land size, and assessed land value. To obtain our land value distribution, we first identify all residential parcels within a quarter-mile away from a TOC project that exchanged hands between 2015 and 2020. We then take their assessed value in the current roll year and discount it by 2 percent per year since the property last sold. We then annually inflate the discounted value by 5 percent up to 2020 and divide it by the parcel's square footage.¹² Finally, we drop all land values per square foot below the 12.5th quantile (approximately \$11 per sq ft) to discard values unusually low for Los Angeles City and compute 20 quantiles on the remaining values to get our distribution of land values near TOC projects.¹³

Our simulated locations relate to 20 neighborhoods that we can group into four market conditions: weak (locations 1 through 5), moderate-low (6 through 10), moderate-strong (11 through 15), and strong (16 through 20). As we already mentioned, we provide some neighborhood examples that lie within each group below.¹⁴

Timeline

Our proforma analysis lasts 13 years, a standard time frame in the industry. In year 0, developers purchase the land and spend the following 2 years building the property. In year 3, the building starts generating rental and other revenue. The developer then sells the property at the beginning of year 13.

Revenues and Expenses

Revenue sources are rental income, garage parking, utility income, and commercial income. We use our rent distribution from census data to simulate rental revenue for every location. We rely on our interviews with local developers to assess other sources of revenue. We assume a 2.5-percent annual rent growth and a 4-percent annual vacancy rate for every location.

Operating expenses include management fees, marketing, on-site management, utilities, repair and maintenance, landscaping, property taxes, insurance, and reserves. We calculate dollar amounts for each item based on interviews with real estate developers who have vast experience in multifamily projects and inclusionary housing programs in Los Angeles. We assume an annual 3-percent growth rate for all expenses. We do not let operating expenses vary by location.

¹² California's proposition 13 caps the growth of assessed property values at 2 percent per year. When a property exchanges hands, the new assessed value reflects the market value. We adjust land value growth since the last transaction by 5 percent per year rather than 2 percent. For example, if a property sold in 2017 and its current assessed land value is \$100,000, we first deflate it by 2 percent for 3 years, obtaining a land value of \$94,232 in 2017. We then inflate this number by 5 percent for 3 years resulting in a land (market) value of \$109,086 in 2020.

¹³ Land values vary significantly more than rents. While rents in an expensive location (location 18) are 100-percent higher than in a more affordable location (location 4), land values are 500-percent higher when comparing both neighborhoods.

¹⁴ We assign locations to six selected neighborhoods based on rent values. Rent census data have a higher degree of precision than assessed land values that may mask vast heterogeneity. In some instances, land values may be calculated as residuals and result in abnormally low values.

Development Cost

We decompose the total development cost into several major components: land value, direct construction cost, parking, government fees, and permit fees. As noted previously, we rely on data from the Los Angeles County Office of the Assessor to calculate land values.

Direct costs include all necessary costs to construct the building, such as excavation for the foundation, raw materials, labor costs, architectural fees, engineering fees, supervision, and contingencies. We compile data on direct construction costs for multifamily housing projects from the 2019 Los Angeles County Assessor Handbook. We also interviewed experienced developers who provided ranges for specific items. We collect data on government and permit fees from the City of Los Angeles Department of City Planning and real estate developer feedback. More specifically, for a representative mid-rise multifamily building in the City of Los Angeles, we estimate a direct construction cost of \$220 per square foot, \$55,000 per parking space, \$1,000,000 for a building permit for a 434-rental unit project, and \$22,000 per unit for the government fee. We also simulate direct construction costs for a high-rise building, which turn out to be much higher at \$280 per square foot.

We introduce a discontinuity in building costs whereby developers face less expensive direct construction costs in weak and moderate-low markets. The lower construction costs in less affluent neighborhoods reflect the broader availability of vacant land plots and the increased flexibility for developers to build horizontally. It may also capture the lower quality of materials or finishings that developers may use in such neighborhoods. Therefore, we decrease construction costs by 20 percent in locations 1 to 10 so that direct construction costs drop from \$220 to \$176 per square foot. Direct construction costs in all moderate-strong and strong markets remain at \$220 per square foot.

Financing

During the construction period in years 1 and 2, developers obtain a construction loan from lenders to finance the construction. Once the building is complete, they refinance the property at a 4.5-percent cap rate and transition to a permanent loan starting from year 3. The permanent loan's annual interest rate is 5.5 percent, with a 10-year loan term and a 30-year amortization period. Developers pay annual debt service. In year 13, developers sell the property with a 5.5-percent exit cap rate and pay off all the unpaid principal.

Affordability Tiers

When a developer participates in an inclusionary housing program, she can provide affordable units to groups of households with different needs. To calculate rents for affordable units in our analysis, we use the midpoints of the U.S. Department of Housing and Urban Development (HUD) low-income definitions to set three affordability tiers: low-income (65 percent of AMI), very-low-income (40 percent of AMI), and extremely low-income (15 percent of AMI). The AMI for the Los Angeles metropolitan area in 2019 was \$73,100. Thus, to calculate annual rents for low-income units, we multiply \$73,100 by the share of income spent on rent, 30 percent, and the selected midpoint, 65 percent. Low-income households pay annual rents of \$14,255. We change the

corresponding midpoint and calculate annual rents of \$8,772 and \$3,290 for very low-income and extremely low-income households, respectively.

Based on the TOC guidelines, developers can increase density by 50 to 80 percent in return for providing affordable units. The level of additional density depends on the distance to the nearest major transportation station. We use a 65-percent increase in density, the mid-point of the range, in our simulations. To receive this 65-percent increase in density, developers must allocate at least 20 percent of total units to low-income households, 11 percent to very-low-income households, or 8 percent to extremely low-income households. We define the inclusionary fraction as the share of affordable units out of the building's total number of units. We experiment with a range of inclusionary fractions for different affordability tiers: 20 to 39 percent for projects with low-income units, 11 to 30 percent for projects with very low-income units, and 8 to 27 percent for projects with extremely low-income units. For some simulation scenarios, we further decrease the minimum inclusionary fractions to examine the sensitivity of IRRs.

Baseline Simulations

Once we assess values for rents, land, revenue, operating expenses, development cost, and set an inclusionary fraction, we can project the cash flows in our proforma and calculate the IRR. For every location, we compare the IRR for a project that has 100-percent market-rate units to the IRR for a project that has more units but affordability restrictions. Rent and land values change for every location, while construction costs jump discretely from \$176 in locations 1 through 10 to \$220 in locations 11 through 20. All other parameters remain fixed across locations. We then examine the responsiveness of the IRR to changes in the inclusionary fraction across different locations.

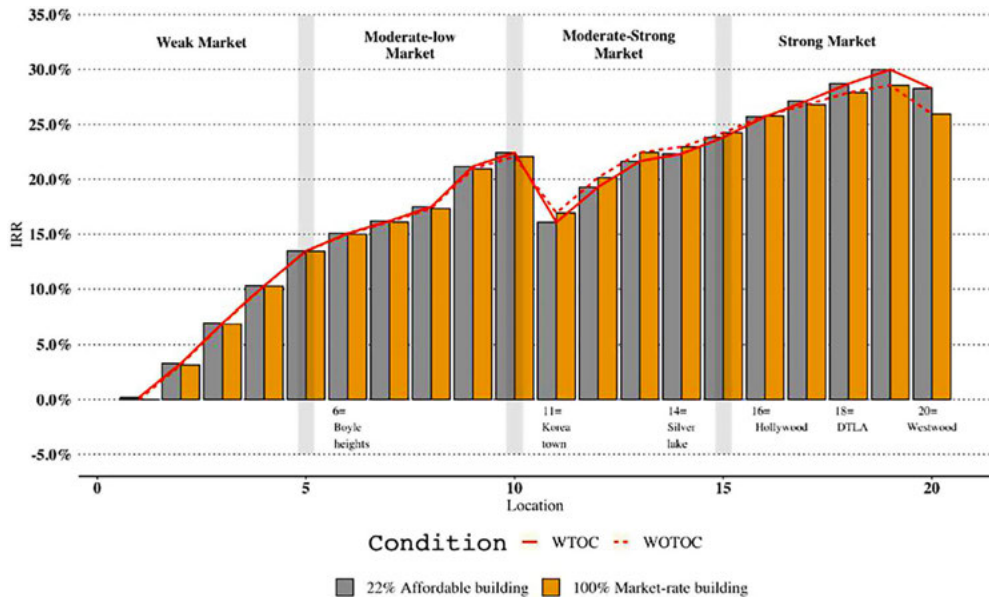
Furthermore, we evaluate how changes in rent, land value, construction cost, government fees, and inclusionary fraction affect the feasibility of inclusionary housing programs, holding other factors constant, across locations and affordability tiers. Our results shed light on the impact of market and policy factors in the provision of affordable housing.

Findings

Exhibit 8 shows the IRRs that developers obtain in each of the 20 locations for projects with and without affordability restrictions. The solid line denotes IRRs for projects with affordable units, and the dotted line refers to projects with only market-rate units. A first impression indicates that IRR differences under both scenarios in most locations are small. Moreover, projects become financially feasible (i.e., they meet the hurdle rate of 12 percent) in all markets except for the weaker ones (locations one through four).

Exhibit 8

IRR for Projects with and Without Affordable Units Across Locations



DTLA = downtown Los Angeles. IRR = internal rate of return. WTOC = projects with affordable units. WOTOC = projects with 100% market-rate units. Source: Authors' calculations

The IRR for a project with affordable units is always greater in weak and moderate-low markets. The gap is minimal in weak markets but gradually amplifies in moderate-low markets. Developers take advantage of the lower construction costs in these less affluent markets and find it more profitable to provide additional density. Simultaneously, the disparity between market and affordable rents is less striking in these locations, so developers lose relatively less revenue per affordable unit than in more affluent markets. Given the relatively low land values in these locations, our simulations indicate that construction costs are the main driver for the higher IRRs for projects with inclusionary housing.

Developers find it more attractive to build 100-percent market-rate projects in moderate-strong markets, as seen by the higher dotted line in locations 11 to 15. This pattern flips in very affluent neighborhoods since developers attain the highest IRRs when building affordable units, reaching a return as high as 30 percent. In these expensive neighborhoods, the cost savings from using less land per unit exceed the income losses from the affordable units required. Land values are disproportionately high in these locations, so developers benefit from any opportunity to lower land costs per unit. For example, the land value in location 19 is 123-percent higher than in location 14 and 213-percent higher than in location 11.

In exhibit 8, we match six selected locations to specific neighborhoods in the city of Los Angeles: Boyle Heights, Koreatown, Silver Lake, Hollywood, Downtown Los Angeles (DTLA), and Westwood. As already noted, we match locations to neighborhoods using monthly rents from

census data. With an average monthly rent of \$1,505, Boyle Heights roughly corresponds to location number 6, a moderate-to-weak market. We notice in the figure that IRRs under both scenarios are virtually indistinguishable. Koreatown, a less affordable neighborhood with an average monthly rent of \$1,887, relates to location number 11 and lies between a moderate-low and moderate-strong market. Developers prefer building a market-rate project in this neighborhood. The same development decision holds in Silver Lake (location number 14), a neighborhood with a higher rent at \$2,188.

The other three neighborhoods are in strong markets with high rents: Hollywood (location number 16) has an average monthly rent of \$2,383, DTLA (location number 18) has an even higher monthly rent at \$2,609, and Westwood (location number 20) has the highest monthly rent at \$2,915. While in Hollywood, developers are almost indifferent between both scenarios; in DTLA and Westwood, they prefer building affordable units.

In sum, our financial simulations match the observed construction patterns of TOC projects observed in the data. Developers find it more attractive to build in moderate-low markets instead of building in moderate-strong markets. However, our simulations also indicate that we should observe more TOC projects in very affluent neighborhoods and fewer projects in weak markets. We acknowledge that our financial simulations may be somewhat limited since we do not explicitly let building quality vary by location.¹⁵ In reality, developers may lower the quality to make projects financially feasible in weaker markets. Another reason that may push developers to build in weak or moderate-to-low markets is the expedited approval process that TOC projects enjoy relative to market-rate projects. We have underscored the substantial time reduction in TOC project approval in the previous section. If we were to model this faster approval process or lower TOC risk rate in our proformas, IRRs with affordable units would increase across the board, making the small differences in locations 4 to 10 more salient.

So far, we have performed our IRR calculations using an affordability share of 22 percent of the total units in a project. However, that share could vary accordingly to make projects more or less attractive to developers, depending on the locations in which they invest. For instance, a lower affordability share could make projects in moderate-to-low markets even more financially attractive, as they would lose relatively less revenue per affordable unit. Moreover, since developers obtain very high IRRs in strong markets, it might be feasible to raise the share of affordable units to the point where they become indifferent between a full market-rate project and one with affordable housing units.

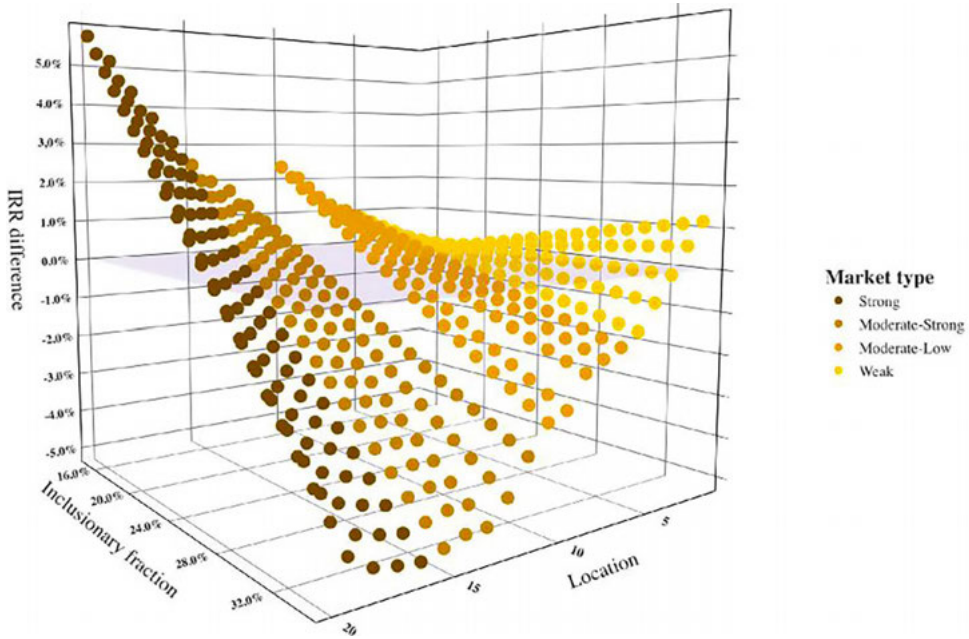
Exhibit 9 presents a 3-D graph where the vertical axis shows the differential IRR between projects with affordable units and market-rate projects. Values above zero indicate that providing affordable units is a financially more attractive alternative. The horizontal-right axis displays the 20 locations, and the horizontal-left axis the inclusionary fraction. This inclusionary fraction is our policy variable: the share of the total units that should be affordable to low-income residents (65 percent of AMI). We consider 20 possible values for the share of affordable housing (the inclusionary fraction in exhibit 4), from a minimum of 15 percent to a maximum of 34 percent. To explore our IRR findings'

¹⁵ Our 20 percent drop in construction costs across locations 1 through 10 is a sharp discontinuity that may ignore gradual declines in quality that developers may incur as they build in lower-income neighborhoods. Further, the reverse pattern may hold as developers gradually increase quality standards in strong markets.

sensitivity, we consider inclusionary fractions below the lowest share permitted by the TOC program. Also, to facilitate the visual analysis, the graph shows a plane at a differential IRR of 0 percent.

Exhibit 9

IRR Sensitivity to Affordability Shares by Location



IRR = internal rate of return.
Source: Authors' calculations

A first finding is that in strong markets, TOC projects can accommodate more affordable units and remain financially more attractive than market-rate projects. For instance, in Westwood, the most expensive area (location 20), projects can give a higher IRR (compared to all market rate) at an affordability share of 26 percent, a higher share than our baseline simulation of 22 percent. The maximum affordability share, which makes developers indifferent between providing affordable units or not, drops to 21 percent in location 16). Thus, in a neighborhood like Hollywood, an inclusionary fraction of 21 percent is about right.

A second finding is that TOC projects in moderate-strong markets can tolerate lower inclusionary fractions ranging from 18 to 20 percent. These are modest reductions in the affordability share compared to our baseline scenario of 22 percent. They suggest that TOC guidelines could be eased in high-opportunity neighborhoods like Silver Lake and Koreatown if policymakers want to induce developers to build more affordable housing.

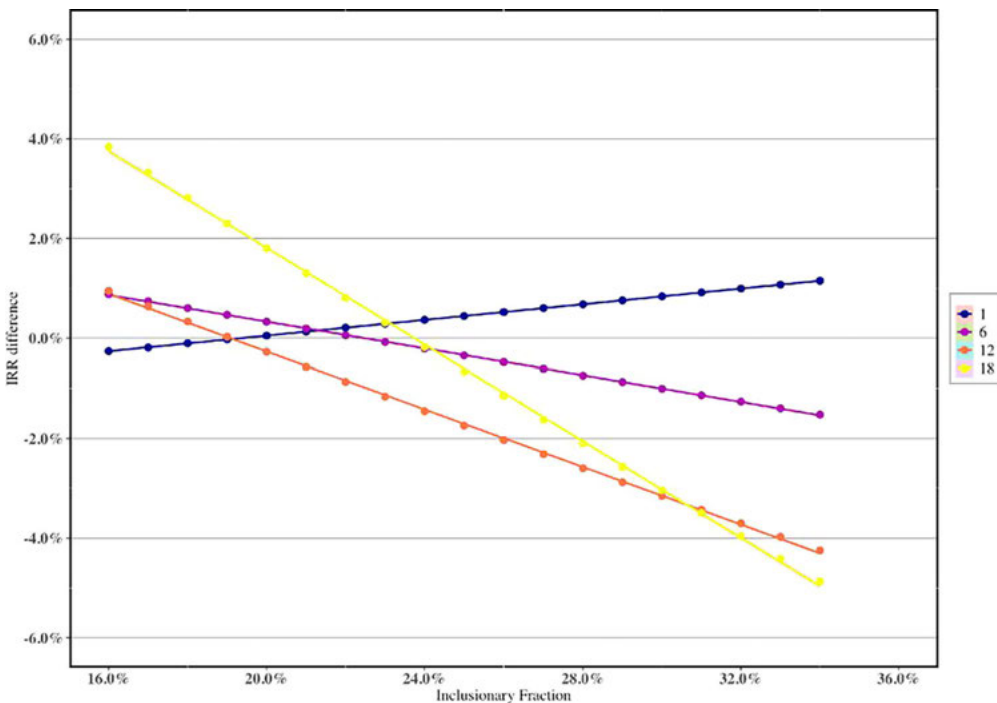
A third finding is that the difference in IRRs between projects with and without affordable units is less sensitive to the inclusionary fraction in moderate-low markets and even inverts in weak markets. As seen in exhibit 9, projects with affordable units are more profitable under an

inclusionary fraction of 22 percent in all moderate-low markets. We find that the inclusionary fraction could increase slightly to 23 percent in location 10. Overall, it seems that the minimum affordability share of 20 percent for low-income households determined in the TOC guidelines aligns well with developer incentives. Furthermore, we note that IRRs increase with the affordability share in very weak markets (locations 1 and 2). Given the low land values and relatively lower construction costs, developers benefit from increased density, given that the rent loss per revenue unit is relatively modest in these very accessible locations.

Exhibit 10 provides a 2-D version of exhibit 9, where we have selected one location from each of the four groups. We plot the IRR difference between projects with affordable units and market-rate projects in the vertical axis. In the horizontal axis, we plot the inclusionary fractions that range from 16 to 34 percent, as in exhibit 9. These four locations summarize the main findings from exhibit 9: the rate at which the IRR difference varies with the inclusionary fraction decreases as we move from strong to weaker markets. The rate reverses in some weak markets and becomes positive in the most accessible locations; hence, developers find it more attractive to increase the affordability share.

Exhibit 10

IRR Sensitivity to Affordability Shares in Selected Locations



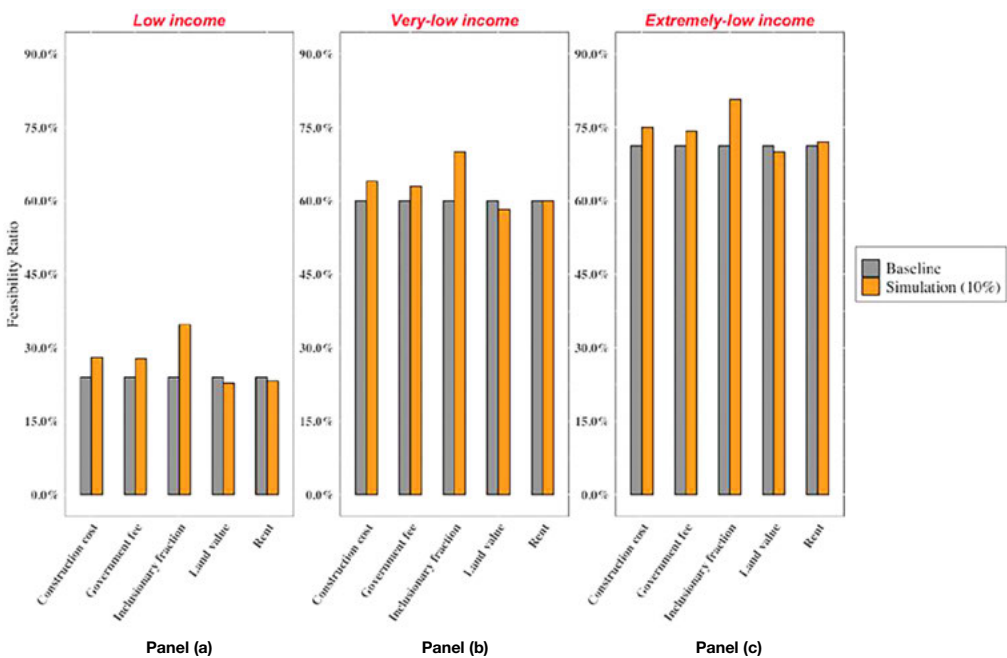
IRR = internal rate of return.
Source: Authors' calculations

In our simulation analysis, multiple factors such as market rents or government fees influence a project's financial feasibility. We examine how financial feasibility varies with five factors: market rents, land values, construction costs, government fees, and an inclusionary fraction (or affordability share). The first three are market factors, whereas the last two are policy factors. While market factors are often not the purview of regulation, our goal is to compare the influence of market conditions and elements of projects such as government fees and the inclusionary fraction that are direct regulatory outcomes. Our thought experiment evaluates the extent to which projects become financially feasible in response to a favorable change in one factor, holding the other factors constant.

We determine the feasibility ratio as the number of dots in exhibit 9 that lie above the differential IRR of 0 percent over the total number of dots (400 in our simulations).¹⁶ In exhibit 9, 176 out of 400 projects (44 percent) exceeded the differential rate of 0 percent. We then let each factor vary by 10 percent, increasing all projects' feasibility regardless of location. For example, we consider a decline of 10 percent in government fees across the board or a 10-percent citywide increase in rents. A larger change in the feasibility ratio indicates a greater relevance for a particular factor.

Exhibit 11

Financial Feasibility of Affordable Housing Projects by Market and Policy Factors



Source: Authors' calculations

In panel (a) of exhibit 11, we present the feasibility ratio's response to each of the five factors for projects that include affordable units for low-income residents. The baseline bars denote that 24

¹⁶ We adjust the range of the inclusionary fraction from 16 to 34 percent to 20 to 39 percent. The latter range aligns better with the TOC guidelines, which set a minimum inclusionary fraction of 20 percent for low-income households.

percent of all projects are financially feasible in our baseline scenario. We find that the feasibility ratio increases the most after a 10-percent reduction in the inclusionary fraction (from 24 to 34.75 percent). A 10-percent reduction in construction costs or government fees results in moderate increments in the feasibility ratio to 28 percent and 27.75 percent, respectively. A 10-percent increase in rents or land values leads to a decrease in the feasibility ratio to 22.75 percent and 23.25 percent, respectively. Therefore, it appears that policy factors are quantitatively more relevant than market factors in determining the financial feasibility of projects that include affordable units for low-income households. While a 10-percent drop in the affordability share induces developers to build TOC projects across the board (and start providing affordable units in moderate-strong markets), a decline in land values or rents increases their incentives to build market-rate projects in more affluent locations.

The TOC guidelines allow developers to build a lower share of affordable units if they allocate them to very low-income or extremely low-income households. We examine our results' sensitivity to lower affordability shares for both groups in panels (b) and (c) of exhibit 11. The baseline bars in panel (b) indicate a feasibility ratio of 60 percent when we let the affordability shares vary from 11 to 30 percent for very low-income households instead of 20 to 39 percent for low-income households in panel (a). Similarly, the baseline bars in panel (c) denote a feasibility ratio of 71 percent when we let the affordability shares vary from 8 to 27 percent for extremely-low-income households. Consequently, we find that, under reasonable ranges of inclusionary fractions, TOC projects become financially more attractive than market-rate projects when the developer allocates affordable units to extremely low-income households. Again, our financial simulations match the observed patterns in the data. As we show in exhibit 5, most TOC projects allocate affordable units to extremely low-income households.

In addition, our simulations in panels (b) and (c) reinforce the predominant role that the inclusionary fraction has as a driver of the feasibility ratio. Construction costs and government fees, though relevant, provide modest increases in the feasibility ratio, and the effects are relatively constant across affordability tiers. The role of land values and market rents remain quantitatively less relevant, yet an increase in rents raises the feasibility ratio marginally when providing affordable units to extremely low-income households.¹⁷

¹⁷ We also examine the financial feasibility of high-rise buildings compared to mid-rise buildings. The additional stories for high-rise buildings come at a steep construction cost for developers (\$280 per square foot), who have to compensate for these additional costs with a rent premium. We calculate IRRs for mid and high-rise projects with a 22-percent affordability share across all locations. We find that the rent premium developers need to charge in high-rise buildings is large, in the range of 15 to 20 percent, or \$380 to \$470. While these incremental rents are reasonable in an affluent metropolitan area like Los Angeles, it might be the case that developers building high-rise projects target a more affluent segment of the market. Therefore, our simulations suggest that developers interested in opting for the subsidy to build a project with affordable housing will usually consider a mid-rise rather than a high-rise project. These results are available upon request.

Conclusion and Implications

Conclusions

Our financial simulations match the observed construction patterns of TOC projects observed in the data. Developers find it more attractive to build in moderate-low markets instead of moderate-strong markets because they take advantage of the lower construction costs in less affluent markets. Developers find it more attractive to build 100-percent market-rate projects in moderate-strong markets. This pattern flips in very affluent neighborhoods. In these expensive neighborhoods, the cost savings from using less land per unit exceed the income losses from the affordable units required.

When we explore the sensitivity of IRRs to affordability shares across locations, we find that (1) in strong markets, TOC projects can accommodate more affordable units and remain financially more attractive than market-rate projects (especially in the wealthiest locations); (2) TOC projects in moderate-strong markets can tolerate lower inclusionary fractions ranging from 17 to 20 percent (these are modest declines relative to our baseline scenario of 22 percent); and (3) the difference in IRRs between projects with and without affordable units is less sensitive to the inclusionary fraction in moderate-low markets and even inverts in weak markets.

The main factor that affects the feasibility of inclusionary housing programs is the affordability share. Land values and market rents show quantitatively small effects. Regarding affordability tiers, projects that provide affordable units to extremely low-income households exhibit a much higher feasibility ratio than projects that target low-income households.

Implications of Inadequate Housing Supply and Effect of Density Bonus and Transit-Oriented Communities

One implication of the shortage of housing in Los Angeles County has been a population outflow. Census estimates that the number of people in the county in 2019 was about 60,000 people lower than in 2015. Nevertheless, this outflow has not helped relieve the housing burden because the county still has in-migration of high-income people. While there is debate on whether the inflow of high-income people displaces low-income residents in specific neighborhoods, such inflows continue to ratchet up demand pressures even as net population growth eases.

In all of this context, the DB and TOC programs are still relatively small. In 2019, they produced 500 units of affordable housing (or less than 0.1 percent of what is necessary under a baseline deficit of 566,000 units) and 4,100 units of all housing (or less than 10 percent of what is necessary to prevent market rents from rising.) These low numbers imply that as admirable in concept as the DB and (especially) the TOC programs are, they are not sufficiently scaled yet to move the needle on housing affordability.

For Los Angeles to actually impact the cost of housing in the region, it will need to roughly double housing production. The TOC program can help with this. First, and most obviously, it allows for a reduction in land costs per unit. A 65-percent increase in zoned units is, holding land prices constant, equivalent to a 40-percent reduction in land cost per unit. Second, it has successfully sped up the process of getting projects permitted by 6 months. Speed reduces costs because it

lowers the total amount of money that must be returned to equity investors and lenders. Suppose the required return for a project is 7 percent per year. Shortening the time to build by six months reduces the cost by 3.5 percent. Further, by bringing more certainty to the permitting process, TOC reduces risk, and therefore, in principle, required return on equity.

As currently designed, the TOC program can be a tool to ramp up the production of units. However, it encourages developers to build a small number of extremely low-income units instead of a larger number of low-income units. Consider the tradeoff: extremely low-income units, with rents of at most 30 percent of AMI, collect less than one-half the rents of low-income units, based on at most 80 percent of AMI. However, to get the full density benefit, developers can choose between 8 percent extremely low-income and 20 percent very low-income units. As 20 percent is more than double 8 percent, the rent foregone by focusing on extremely low-income units is less than the rent foregone by focusing on low-income units. In a market that is hundreds of thousands of units short of affordable units, the TOC program, in its current calibration, will make a small dent, even if it leads to substantial increases in total units.

That said, the TOC program is overall well-calibrated—it encourages developers to build while not providing them a windfall. Greg Morrow’s (2013) dissertation showed how under-zoned Los Angeles is, and the only way for the city to overcome its housing shortage is to upzone. Until TOC came along, upzoning tended to happen in a bespoke manner; thus, developers that upzoned would receive windfalls that many found inequitable. This practice has led to a general objection to upzoning—that it is unfair to give developers something of great value (i.e., larger FARs) that they did nothing to earn.

Measure JJJ contemplated automatic upzoning in exchange for concessions by developers. The idea was to have transparent rules about the condition of upzoning, thus bringing greater certainty to the development process while ensuring that developers paid a community benefit that would not be so burdensome as to stifle development but would be sufficiently large to prevent windfalls. The TOC program has so far proved to do just that.

Acknowledgments

We are grateful for funding in support of this research from the John Randolph Haynes and Dora Haynes Foundation. This work benefited from an advisory panel consisting of Ashley Atkinson, Matthew Glesne, Ann Sewill, Doug Smith, and Ben Winter. We interviewed affordable housing developers, who generously provided us with construction data that helped validate the cost data we used in our financial scenarios.

Authors

Jorge De la Roca is an **Assistant Professor** at the University of Southern California Sol Price School of Public Policy.

Marlon Boarnet is a **Professor** at the University of Southern California Sol Price School of Public Policy.

Eugene Burinskiy is a **Ph.D. candidate** at the University of Southern California Sol Price School of Public Policy.

Linna Zhu is a **Research Associate** at the Urban Institute. She can be reached at lzhu@urban.org or 1 571-388-0805.

Richard K. Green is a **Professor** at the University of Southern California Sol Price School of Public Policy and Marshall School of Business, and the **Director** at the USC Lusk Center for Real Estate.

References

Boarnet, Marlon G., Raphael Bostic, Danielle Williams, Raul Santiago-Bartolomei, Seva Rodnyansky, and Andy Eisenlohr. 2017a. Affordable Housing in Transit-Oriented Developments: Impacts on Driving and Policy Approaches. White Paper of the National Center for Sustainable Transportation. https://www.metrans.org/assets/research/NCST-TO-027-Boarnet-Bostic-Affordable-TOD-White-Paper_FINALv2.pdf.

———. 2017b. Can Affordable Housing in Transit-Oriented Development Help Solve California's Housing Crisis While Also Addressing Environmental Goals? Policy Brief of the National Center for Sustainable Transportation. https://www.metrans.org/assets/research/Affordable-Housing-Policy-Brief-Boarnet_v2-1.pdf.

Bostic, Raphael and Anthony Orlando. 2016. Sustainable Financing Structures for Population Health: Historical Patterns and Insights for the Future: Comissioned Paper. In Building Sustainable Financial Structures for Population Health: Insights from Non-Health Sectors: Proceedings of a Workshop. Washington, D.C.: National Academies Press. Available at http://www.anthonworlando.com/wp-content/uploads/2013/11/BosticOrlando2017_SustainableFinancingPopulationHealth.pdf. accessed December 5, 2020.

Collinson, Robert, Ingrid Gould Ellen, and Jens Ludwig. 2015. Low-Income Housing Policy. Working paper w21071. Cambridge, MA: National Bureau of Economic Research.

Lagos, Marisa. 2018. "Voters Pass Affordable Housing Bond and Measure for Mentally Ill Homeless." The California Report. KQED, November 7. <https://www.kqed.org/news/11703228/voters-likely-to-pass-affordable-housing-bond-measure-for-mentally-ill-homeless-okd>.

Los Angeles Homeless Services Authority. 2020. <https://www.lahsa.org/news?article=726-2020-greater-los-angeles-homeless-count-results>.

Morrow, Greg. 2013. "The Homeowner Revolution: Democracy, Land Use and the Los Angeles Slow Growth Movement, 1965-1992." Ph.D. diss., Urban Planning UCLA.

O'Neill, Moira, Giulia Gualco-Nelson, and Eric Biber. n.d. Examining the Local Land Use Entitlement Policy in California to Inform Policy and Process. Working paper 2. Berkeley, CA: UC Berkeley School of Law. <http://iurd.berkeley.edu/news/examining-california-land-use-entitlements>.

Quigley, John, M., and Steven Raphael. 2004. "Is Housing Unaffordable? Why Isn't It More Affordable?" *Journal of Economic Perspectives*, 18 (1): 191-214.

Rosen, S., 1974. Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition. *Journal of Political Economy*, 82(1), pp. 34-55.

Schuetz, Jenny, Rachel Meltzer, and Vicki Been. 2011. "Silver Bullet or Trojan Horse? The Effects of Inclusionary Zoning on Local Housing Markets in the United States," *Urban Studies* 48 (2): 297-329.

———. 2009. "31 Flavors of Inclusionary Zoning: Comparing Policies From San Francisco, Washington, DC, and Suburban Boston," *Journal of the American Planning Association* 75 (4): 441-456.

Schwartz, Alex F. 2010. *Housing Policy in the United States: An Introduction*, 2nd ed. Abingdon, United Kingdom: Routledge.

Schwartz, Heather L., Raphael W. Bostic, Richard K. Green, Vincent J. Reina, Lois M. Davis, and Catherine H. Augustine. 2016. *Preservation of Affordable Rental Housing: Evaluation of the MacArthur Foundation's Window of Opportunity Initiative*. RAND Corporation report to the MacArthur Foundation. Santa Monica, CA: RAND Corporation.

Urban Land Institute. 2016. New CoStar Data Identifies 5.5 Million Units of Naturally Occurring Affordable Housing in Markets Across the United States. Urban Land Institute press release, October 18. Washington DC: Urban Land Institute. <http://uli.org/general-posts/new-costar-data-identifies-5-5-million-units-naturally-occurring-affordable-housing-markets-across-united-states/>.