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The Ralph & Goldy Lewis Center for Regional Policy Studies advances research on how people live, move, and work in the Los Angeles region, with a focus on policies and interventions that provide paths out of poverty. Since 1989, Lewis Center scholars and staff have produced high-quality research, programs and events, and accessible publications for policymakers, officials, students, opinion leaders, and the public. The Lewis Center leverages research grants from affiliated scholars to create a diverse research portfolio.

About the Authors

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Highlights

- The State of California seeks to increase housing production by regulating the number of homes local zoning allows, yet the market feasibility of delivering units under more expansive zoning is rarely acknowledged and mostly unanalyzed.
- New guidelines from the Department of Housing and Community Development emphasize the need to assess realistic capacity of sites, including the feasibility of new housing development during the upcoming planning period.
- One statewide policy push is to allow three- and fourplexes in single-family zones. To assess the impact of this zoning change, we analyze the market feasibility of homebuilding under fourplex zoning on the 6.8 million parcels with single-family homes built in California prior to 2005.
- We find that at present, there is potential for 1.5 million new units in the form of accessory dwelling units and juniors, but that allowing fourplexes on these sites would nearly double this number, creating market-feasible potential for 1.2 million additional new homes.
- Even though fourplex production would be the most profitable use for only a small fraction of *parcels*, it leads to a substantial unit production by quadrupling density on a given site.
- We also estimate that increasing development options through fourplex zoning will dramatically reduce mansionization, by making the most profitable redevelopment option for a single-family parcel something other than replacing the single-family home with a larger one.
- Our analysis emphasizes how the increase in market-feasible housing enabled by allowing fourplexes varies across regions and municipalities. For example, in some cities over 250 additional units become feasible per 1,000 parcels whereas in others fewer than 100 would be enabled by fourplex zoning.
- Cities also differ in terms of how many *parcels* become newly feasible for redevelopment. For some cities additional units are feasible on new parcels, whereas for others larger projects pencil on parcels where some redevelopment was already feasible.

Introduction

The State of California has recently sought to address its housing shortage by expanding the number of homes local zoning allows in different neighborhoods. One avenue has been quite direct: state law now requires cities to allow Accessory Dwelling Units (ADUs) and Junior ADUs in single-family neighborhoods. Another avenue is more complex: cities are required to update their Housing Elements every eight years to allow for an increasing number of homes, and must rezone if their existing zoning does not have sufficient space. However, the market feasibility of delivering units under new zoning rules remains underemphasized and unanalyzed by the state.

The lack of this kind of information hinders policy discussions over zoning reform. Previous Lewis Center briefs argue that the state planning process for housing [pushes for more zoning in the wrong places](#) and [our analysis of cities' 'zoning capacity'](#) shows it is insufficient and in the wrong parts of the state. But beyond an assessment of where there is zoning, we also have a limited understanding of what happens when zoning is made more permissive. This is partly because local governments have been making zoning more restrictive for so many decades, but it is also because municipal zoning codes are varied and complex.

Credible projections of the impacts of changes to zoning on eventual housing production — even if they are based on several strong assumptions — will improve the quality of public debate and policy outcomes. Moreover, [new guidelines](#) from the Department of Housing and Community Development emphasize the need to assess realistic capacity of sites, including the feasibility of new housing development based on evidence. Establishing a framework for estimating the production effects of zoning changes is important if we are to refine the quality of estimates over time.

In this brief, we present an estimate of the market-feasible new home production on the state's stock of single-family parcels if the state were to allow fourplexes on all these parcels, and characterize how the impacts of this change vary across regions and cities. We do this in response to legislative efforts to allow this type of housing more broadly. Another summary of this collaboration between [UrbanFootprint](#) and [MapCraft](#) has also been published [here](#).

We first describe the way zoning changes will eventually result in new homes, using the metaphor of a production funnel. Then, we define market feasibility and our methodology. Last, we highlight the major findings from the analysis. There are, of course, many caveats associated with this sort of analysis. But existing projections of how zoning reform can increase statewide housing production are limited, which means this work contributes substantially to public discussion of state-level zoning reform policies.

Numerous housing bills introduced in the 2020 legislative session related to small-scale housing development, including Assembly Bill 3040, which focuses on the Regional Housing Needs Assessment (RHNA) process and was the primary inspiration for this policy brief.

- AB 3040: Gives RHNA credits for older single-family homes zoned for fourplexes
- SB 1120: Requires two-unit housing developments to be considered ministerially
- AB 3155: Streamlines missing middle housing approvals
- SB 902: Establishes duplex zoning statewide and provides CEQA exemptions
- SB 592: Clarifies that ADUs are protected by the Housing Accountability Act
- AB 1924: Requires fees to be assessed on a per-square-foot basis
- AB 725: Requires distinct housing formats to qualify for RHNA credits

The Production Funnel: One Way to Think about the Impacts of Zoning Reform

The zoning code is the set of rules that dictates what kind and how many homes can be built on any given piece of land. In most of California's highest demand cities, [zoning prohibitions are the primary reason housing is not being built](#). Zoning, however, is only the first step in a path that shapes whether and how much housing is built on a given site. **Figure 1** is a diagram of a 'production funnel', a stylized way to think about how increasing (or decreasing) zoning rules eventually determine housing production.

After a parcel's zoning shapes what can be legally built, the second step in the funnel is market feasibility. In brief, is it profitable to build housing there? What kind? Developers will not (usually) build new housing of a particular type unless there is demand for it in a neighborhood, and property sellers will typically sell their land to the highest bidder. Developers do not maximize the number of units zoning allows, but build the most profitable type of housing, which can be less than is permitted.

But in order for a developer to build these homes, they must be able to acquire a site. Thus the third level of the funnel refers to the rate at which properties are sold. Even where there is allowable zoning and market demand, only a small portion of the market-feasible developments are likely to be delivered in part because property transacts infrequently.

The final stage is actual housing production. Even where there is permissive zoning, the next level is market feasible, and sites are being sold, housing may not be produced. Development can be inhibited by local regulations outside of zoning that also govern the development process, capital availability, labor capacity, market absorption and changing preferences, and other issues specific to developers themselves. The result of the processes the funnel describes is that millions of market-feasible opportunities may yield relatively few built units, perhaps just a few thousand units every year.

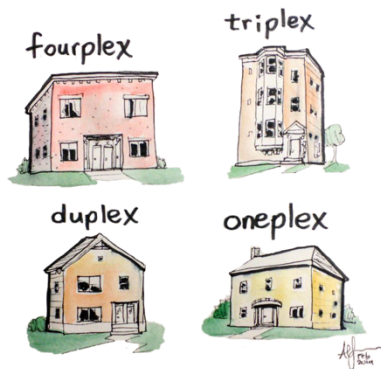
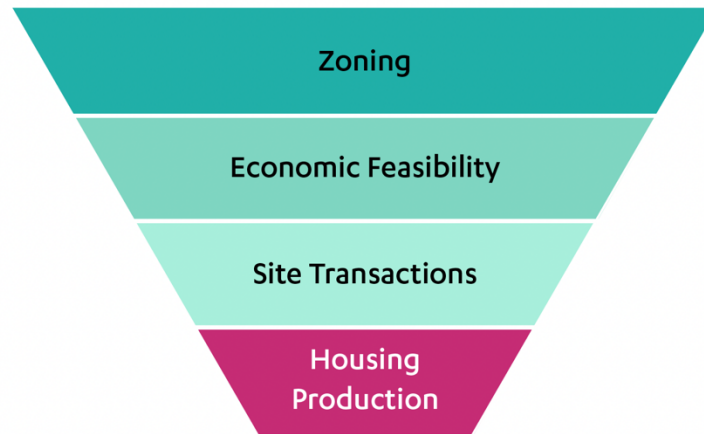
Figure 1: Simplified Production Funnel

Illustration by [Alfred Twu](#)

Methodology

We considered market-feasible housing capacity on the 6.8 million parcels in California that currently have a single-family home built prior to 2005. We used [MapCraft's Lab analysis tool](#) to determine what types and scales of housing development would be feasible with an approach that considers construction costs, market demand, financing, land use policies, and individual parcel characteristics.

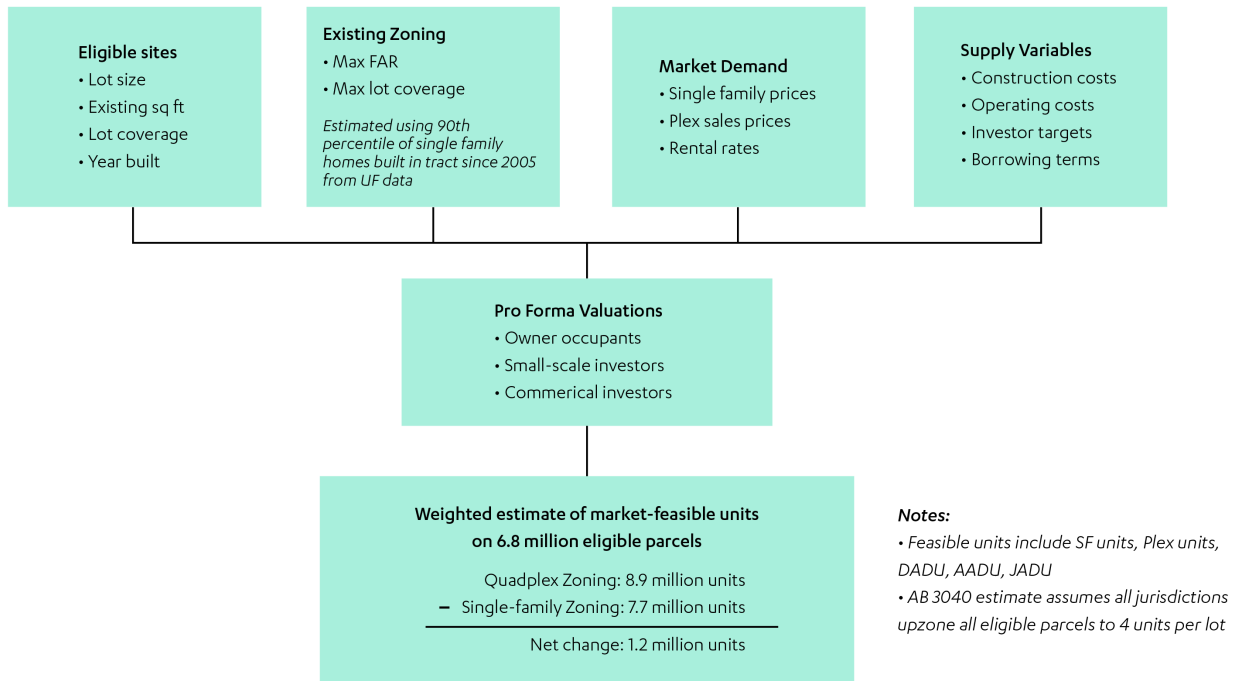
The evaluation relies on parcel data analyzed by [UrbanFootprint](#). UrbanFootprint's parcel dataset includes all counties in California with populations greater than 45,000 people. For the purposes of this evaluation, all properties with single-family detached land use were assumed to currently have exactly one existing unit (i.e., no accessory dwelling units (ADUs)) and single-family zoning that limited redevelopment. To support this assumption, UrbanFootprint scanned zoning in a sample of cities, finding that the vast majority of parcels with single-family homes are zoned for single family. Consistent with the eligibility criteria of AB 3040, one of the many state bills that would lead to upzoning, we excluded single-family parcels with structures built since 2005 from the analysis.

UrbanFootprint’s parcel data includes information on each lot and the single-family homes on those lots. In combination with tax assessor data, we estimated the value of each existing single-family property.

To compute snapshots of market feasibility on every relevant parcel, both under current policies and proposed policies, MapCraft relies on typical [development pencil out models](#), which are financial evaluations conducted by developers to assess an investment’s viability early in the development process. MapCraft’s models of small-scale development contemplate financial feasibility from the perspectives of owner-occupants, owner-occupant landlords, small-scale investors, and commercial investors, with market-feasible unit potential based on a probabilistic blend of all possible development options. Financial expectations of investors and lending terms are based on conversations with industry professionals and are updated by MapCraft regularly.

MapCraft’s financial calculations incorporate data and assumptions about current rents, sales prices, construction costs, and investors’ expected return rates, and are validated by [ECONorthwest](#), a West Coast economics consultancy. MapCraft’s market demand information relies on multiple sources, including [CoStar](#), [Zillow](#), tax assessors, [U.S. Census](#), and transaction records. MapCraft’s construction cost information is based on interviews and costs are localized based on [RS Means](#). Finally, the modeling relies on assumptions about parking requirements, typical unit sizes, and other factors that inform development. [Economic & Planning Systems](#) and the [UC Berkeley’s Terner Center](#) also gave input in developing our approach and assumptions.

Figure 2: MapCraft’s Feasibility Assessment of all AB 3040-eligible Parcels Identified by Urban Footprint



Our business-as-usual scenario evaluates development feasibility for a variety of development options under single-family zoning, while the alternative policy scenario considers the additional set of development options allowed under fourplex zoning. Notably, the number of options available under single-family zoning is greater than a single-family home because California state law requires that jurisdictions allow ADUs and junior ADUs.

Table 1: Development Options Analyzed

Options under single-family zoning (business-as-usual policy context)	Options with fourplex zoning
Do nothing — Existing single-family structure remains	All options available under single-family zoning, plus:
Add Detached ADU (DADU)	Convert existing house to duplex, threeplex, or fourplex
Build Attached ADU	Add DADU and convert existing house to duplex, threeplex, or fourplex
Add DADU + Junior ADU	Add addition, then convert house to duplex, threeplex, or fourplex
Tear down and build new SFR (i.e., McMansion)	Tear down and build new duplex, threeplex, or fourplex

To be realistic about the policy constraints that limit development, we rely on coarse zoning-like limitations interpolated from recently built houses in each tract. We assumed that developments on a parcel would need to conform to the 90th percentile of height, FAR, and lot coverage of other recently built homes in the same census tract. In other words, we assumed that plexes would be held to the same bulk restrictions as new single-family homes.

Small parcels could also inhibit additional development in spite of relaxed zoning, particularly for the construction of larger buildings. Further, combining multiple parcels into a single lot to allow for denser new development, where financially feasible, is complex in practice and less likely to occur than development on a pre-existing parcel. These factors were incorporated into our analysis.

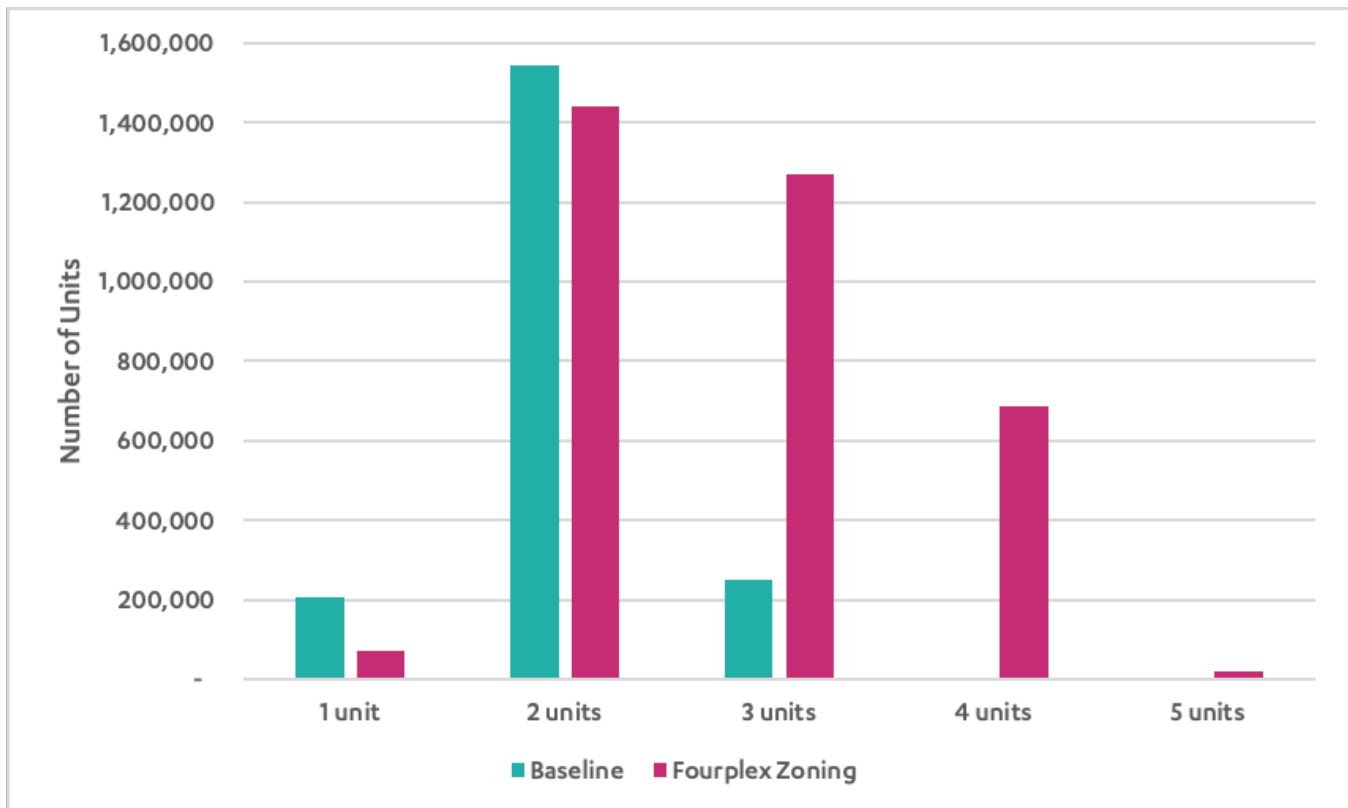
Ultimately, MapCraft’s analysis of the eligible parcels identified by UrbanFootprint gives a sense of the likelihood that the different development options are pursued on a given site. The weighted average results of all the options result in a number of units that is somewhere between one unit (the existing single-family remains or is replaced by another single-family home) and five units (a fourplex and ADU are constructed).

Findings: How Many New Units Would Fourplex Zoning Unlock? Where?

The analysis of market-feasible production on the 6.8 million parcels with single-family homes built in California prior to 2005 under existing laws, which permit an accessory dwelling unit (ADU) and a junior ADU reveals that there is potential for roughly 1.8 million new units now. Roughly 85% of these are single-family homes where building an ADU pencils out according to costs and rents, and the remainder are those where adding both an ADU and JADU are profitable.

Changing zoning to allow fourplexes on these sites would nearly double the market-feasible potential for housing. It would add market-feasible potential for 1.2 million new homes, in a scenario that does not change local restrictions on the bulk of new buildings. That is, the new buildings would be the same size as recently built single-family homes although they would house many more people. **Figure 3** presents these calculations by the unit size of new buildings before and after the zoning reform.

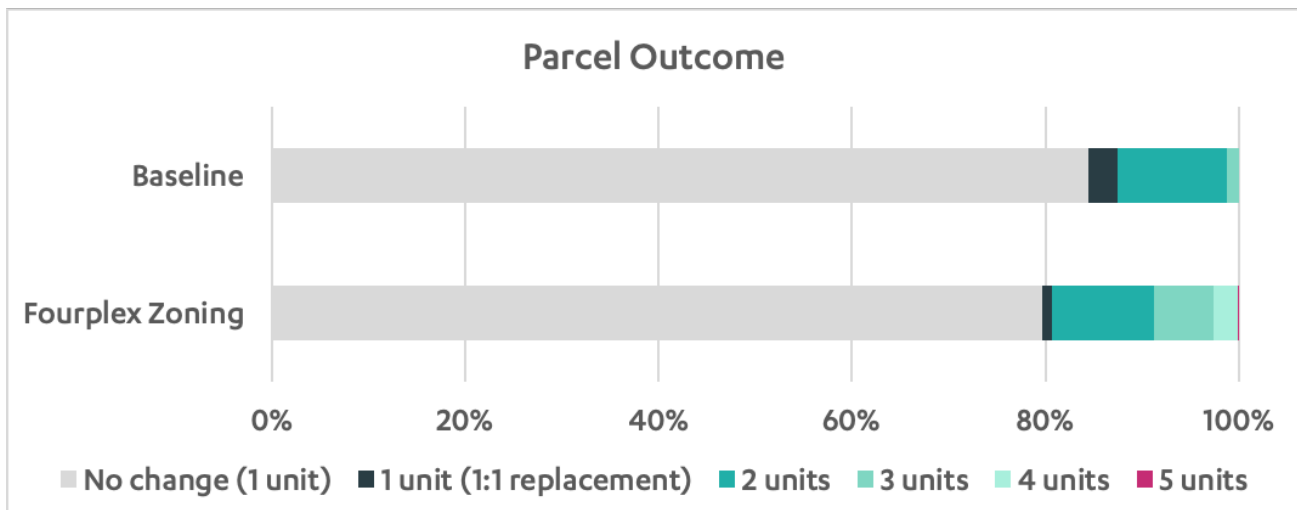
Figure 3. Estimates of Market-Feasible New Units Now and With Fourplex Zoning



Of the roughly 700,000 market-feasible 2-unit projects, we estimate that about 40% would be a house with an ADU, while the remaining 60% would be duplexes. For parcels with three units, we estimate that triplex is by far the most likely development outcome (93% of parcels) rather than a duplex with an ADU.

An important side benefit of increasing development options with fourplex zoning is reducing the likelihood that development on a given parcel will be a one-for-one replacement of an older single-family home with a new one, a phenomenon known as mansionization. New, large single-family homes in urban neighborhoods with high job accessibility are an inefficient land use and we project that a shift to fourplex zoning will reduce the profitability of mansionization substantially — from about 200,000 market-feasible units at present to 50,000.

Figure 4. Estimates of Market-Feasible *Parcels* Now and With Fourplex Zoning



We estimate that many of the newly feasible market-feasible *units* would be in fourplexes. Fourplexes, however, would be the most profitable use for only a small fraction of *parcels*. **Figure 4** demonstrates this by showing the estimated market-feasible outcome for all 6.8 million parcels. It is important because it reinforces the fact that the vast majority of single-family parcels we evaluated do not have a profitable redevelopment option currently — or under fourplex zoning.

Regional Variation

Given that the demand for housing differs dramatically across cities and neighborhoods and construction costs do not, we expect to see [a larger impact of zoning reform in places with higher rents and prices](#). The detailed impacts of allowing fourplexes in single-family neighborhoods, however, are nuanced. In some places, for example, it will remain more profitable to replace a single-family home with a much larger single-family home than a fourplex rental. Our analysis considers all potential redevelopment configurations. We find substantial differences across cities in how much redevelopment is market-feasible and what kinds of redevelopment are most profitable.

Figure 5. Estimates of Market-Feasible New Units Now and Under Fourplex Zoning, Select Cities (Ordered by Net New Market-Feasible Units)

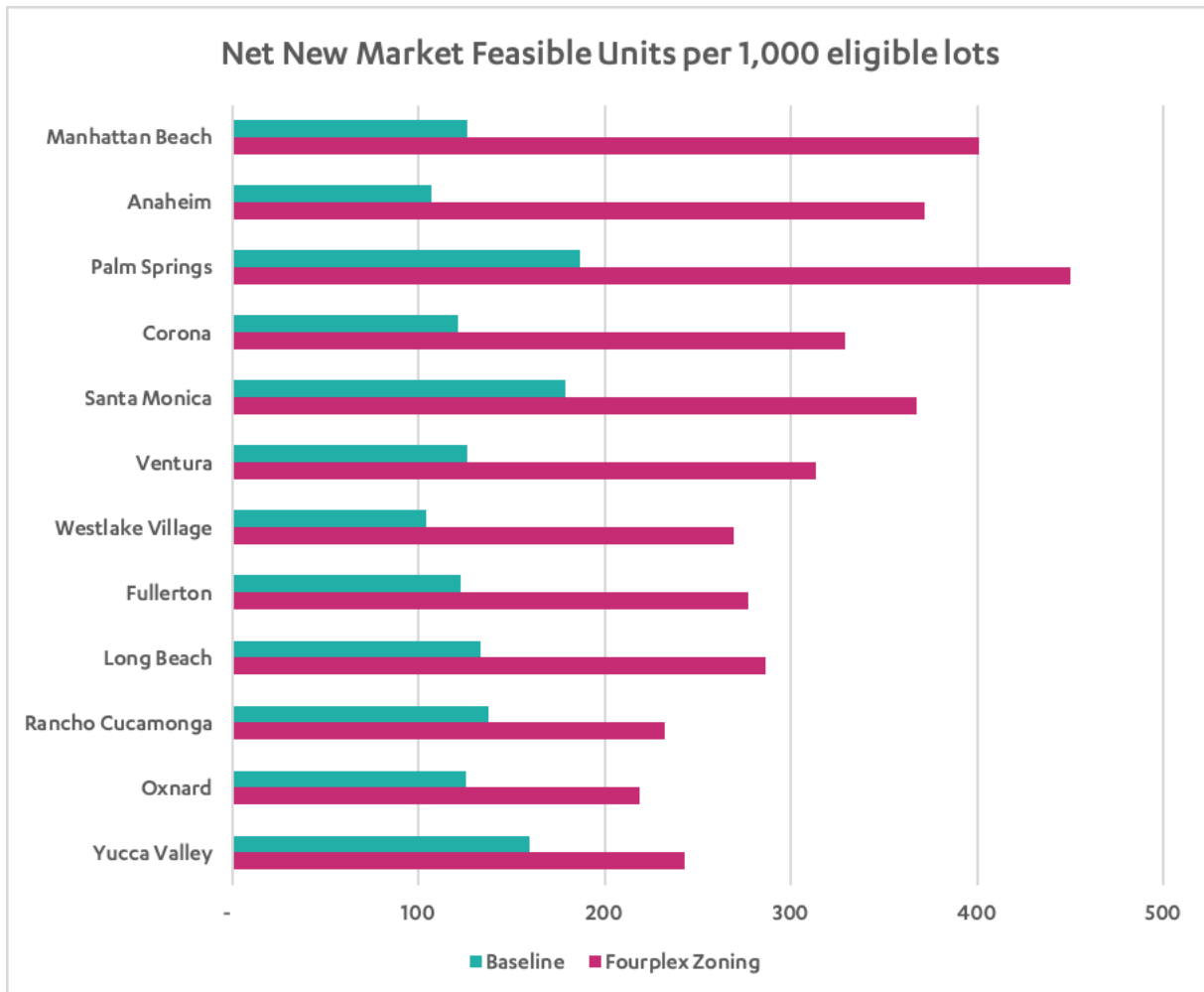
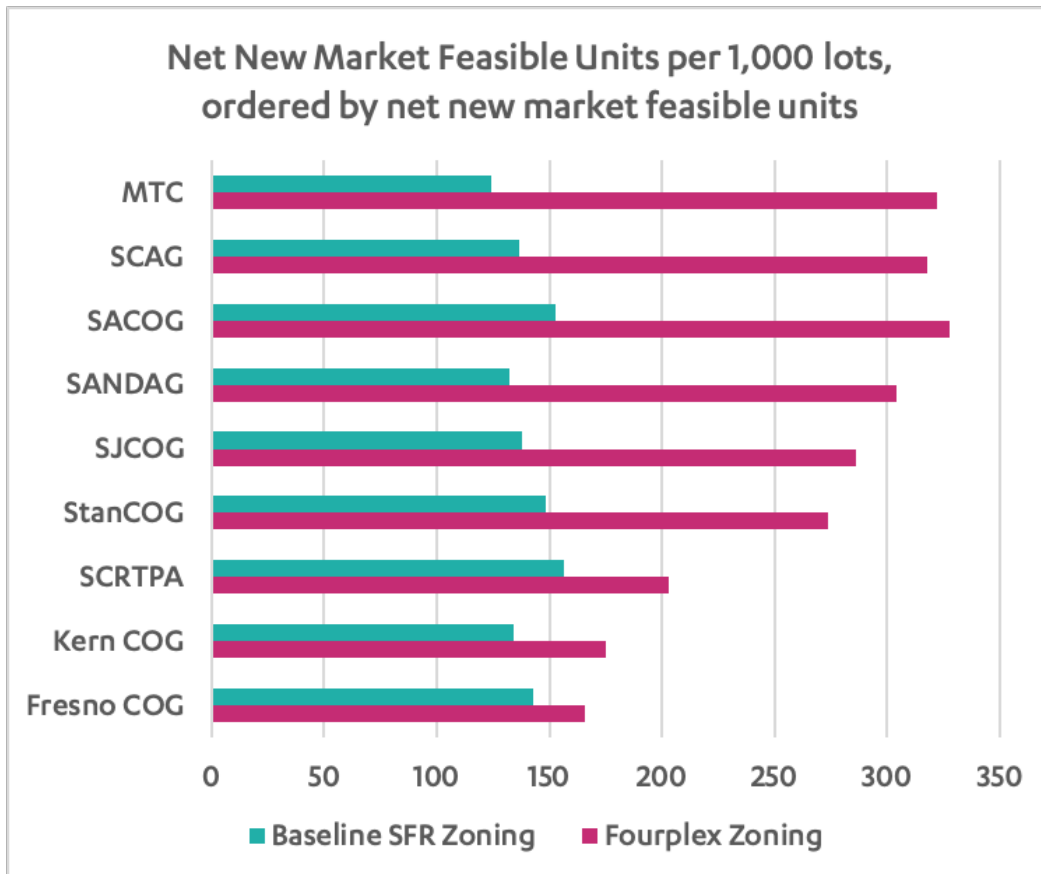


Figure 5 shows the estimates of market-feasible unit production (per 1,000 parcels) for a selection of Southern California cities. The baseline considers the various ADU and JADU options, while the fourplex scenario assesses feasibility of three and four units plus ADUs. The cities are ranked by the estimated impact of fourplex zoning — in Manhattan Beach and Anaheim it would create more than 250 newly feasible units per 1,000 parcels whereas in Oxnard or Rancho Cucamonga fewer than 100. This ranking roughly matches market potential after the zoning change, but much less with market-feasible production at baseline. Anaheim, for example, has some of the least potential for new homes of these cities now, but with fourplex zoning, it moves to be nearly the highest potential.

The levels of market-feasible production are not simply a function of rents — as this brief describes, they reflect the differences between rents and prices, as well as a proxy for local regulations on the bulk of single-family dwellings. Thus, although Santa Monica has a similar estimated unit change with fourplex zoning as Corona, the way this plays out is very different. Santa Monica currently has a large number of parcels on which replacement of a single-family home with a new one is market-feasible, so fourplex zoning doesn't substantially increase the

number parcels for which redevelopment is profitable. Instead, it shifts the more profitable outcome to projects with more units. On the other hand, fourplex zoning in Corona would create profitable redevelopment on many more parcels than presently have market-feasible options. Detailed numbers by changes in market feasibility by unit-count are presented in Appendix Table 1.

Figure 6. Estimates of Market-Feasible New Units Now and Under Fourplex Zoning, Select Regions (Ordered by Net New Market-Feasible Units)



The differential impacts of fourplex zoning across regions are less complex than differences between cities. **Figure 6**, which shows market-feasible units now (baseline) and after fourplex zoning for the nine largest urban regions in the state, tells a simple story. Impacts are substantial and similar for the more expensive coastal markets, where market-feasible production would more than double. They are much less pronounced in many of the central valley regions. In Fresno County, for example, we estimate that the number of market-feasible units would increase by less than a fifth.

Differences in expected market feasibility between different kinds of projects do vary within the coastal regions. For example, many parcels in SACOG where a two-unit project is now the most profitable option, shift to a three or four-unit project. In the Bay Area, on many parcels where a replacement single-family is currently the more

profitable option, a three or four-unit project becomes more probable if it were allowed. Appendix Table 2 presents market feasibility by the unit size of projects.

Conclusion: State Housing Policy and Planning Needs Market Analysis

This brief presents estimates of the changes in market-feasible housing production if fourplexes were to be allowed in single-family neighborhoods. The California Legislature is considering several bills that attempt to increase housing production by expanding how many homes are allowed on single-family parcels, yet the impact of these zoning changes are uncertain. The market feasibility of delivering units under increasingly permissive zoning has not received sufficient attention, and this hinders policy development.

Moreover, until recently the planning processes under the state's Housing Element Law ignored the market reality of where homebuilding is most likely to occur. The law requires cities and counties to update the housing element of their general plan to accommodate a target number of housing units during the subsequent eight years. Yet jurisdictions were traditionally required to only demonstrate a marginally higher zoned capacity — a quantification of how much new housing *could* legally be built on vacant or underutilized parcels — than this housing need. This process implicitly assumed that all vacant and underutilized parcels in the city will be built out during the next eight years, which to our knowledge has never happened. New HCD guidelines, fortunately, begin to emphasize the need to demonstrate the realistic capacity of sites, including the market feasibility of development actually occurring.

This brief presents an estimate of market-feasible housing production under fourplex zoning and compares it to a current baseline. Our main finding that allowing fourplexes on the 6.8 million parcels that currently have a single-family home built before 2005 would create the market-feasible potential for 1.2 million additional new homes — not the 20.4 million homes (three additional units per parcel) that a complete build-out implies. An additional contribution of the analysis is that state ADU and Junior ADU legislation has created the market-feasible potential for nearly 1.5 million new units. The comparison of differential impacts on housing production in selected cities underscores the importance of better [incorporating development probabilities into state housing planning](#).

Appendix Table 1. Change in market-feasible units under fourplex zoning per 1,000 eligible parcels, Select Southern California Cities

	No Change	1 Unit	2 Units	3 units	4 units	5 units	Total Net New Feasible Units
Manhattan Beach	-81	-49	34	252	115	4	275
Anaheim	-93	-27	16	236	131	2	265
Palm Springs	-58	-44	-32	231	165	2	263
Corona	-86	-5	7	176	113	3	208
Santa Monica	-8	-63	-38	194	101	4	189
Ventura	-46	-31	-13	171	105	1	187
Westlake Village	-24	-40	-15	135	105	5	165
Fullerton	-22	-38	-24	151	86	2	154
Long Beach	-45	-22	-4	155	68	0	153
Rancho Cucamonga	-15	-11	-53	103	68	2	95
Oxnard	-25	-8	-26	98	54	1	93
Yucca Valley	-17	0	-59	76	81	2	83

Appendix Table 2. Change in market-feasible units under fourplex zoning per 1,000 eligible parcels, Select regions

	No Change	1 Unit	2 Units	3 units	4 units	5 units	Total Net New Feasible Units
SCAG	-53	-22	-11	164	102	2	182
MTC	-51	-32	-6	171	114	2	198
SACOG	-56	-7	-39	154	119	4	175
SANDAG	-45	-21	-21	150	107	3	172
Fresno COG	-5	0	-14	21	20	2	23
Kern COG	-14	0	-11	38	27	2	41
SJCOG	-59	-1	-12	134	83	2	148
StanCOG	-51	0	-12	123	64	1	125
SCRTPA	-13	0	-19	36	40	2	46