

RIGHT TYPE RIGHT PLACE

Assessing the Environmental and Economic Impacts of
Infill Residential Development through 2030



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Infill Residential Development through 2030**

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EXECUTIVE SUMMARY

California's long-term economic prosperity and environmental sustainability will depend on how much and where housing gets built in the state.

Residents in the largest coastal cities in California encounter some of the most unaffordable homes in the nation, caused in large part by a thriving economy and a multi-decade-long undersupply of housing relative to population and job growth. In addition to the income squeeze of unaffordable homes and long commutes, the housing shortage creates environmental challenges. Most prominently, building more auto-dependent housing far from job centers generates more traffic and air pollution while destroying open space and agricultural lands. Furthermore, these development patterns undermine that state's long-term greenhouse gas reduction goals, including newly legislated 2030 targets.

California instead could meet long-term economic and environmental objectives by building the right type of housing in the right places. That means homes that allow for reduced driving, as well as less energy and water usage, with compact development near transit, goods, and services.

Other than one industry-based analysis, California has lacked an objective and comprehensive assessment of the potential economic and environmental impacts of new housing production on the state's 2030 climate goals. To address this research gap, the Center for Law, Energy, and the Environment (CLEE) at UC Berkeley School of Law and the Turner Center for Housing Innovation at UC Berkeley (collectively the "Centers"), with support from Next 10, prepared this report to assess the environmental and economic impacts of housing production scenarios that could help meet the state's proposed 2030 greenhouse gas reduction target under Senate Bill 32 (Pavley, 2016). This report also offers best practices and policy recommendations for state and local governments to boost housing production within California's existing urban footprint. The Centers have assessed existing data and consulted with development experts to quantify the costs and benefits of a 2030 growth scenario that can inform state and local policy going forward.

Of the three housing production scenarios analyzed, the Centers found that the infill-focused housing growth scenario provides the best outcomes for meeting the state's climate goals while also producing economic benefits. This scenario could help avert at least 1.79 million metric tons of greenhouse gases annually compared to the business-as-usual scenario, based on reduced driving miles and household energy usage alone. That number is equivalent to:

- Averting emissions from 378,108 passenger vehicles and from burning over 201 million gallons of gasoline annually¹
- Almost 2/3 of the total statewide emissions decrease California achieved between 2013 and 2014 alone
- Almost 15 percent of the emissions reductions needed to reach the state's Senate Bill 375 (Steinberg, 2008) targets from statewide land use changes

Together with other land use changes that this housing scenario could stimulate, the savings would help the state meet its goals of reducing emissions from a projected 431 million metric tons in 2020 to 260 million metric tons by 2030, as required by state law.²

The infill scenario produces slightly higher annual economic growth, more tax revenue, and lower overall construction costs than business-as-usual growth. Meanwhile, the average household would see lower overall monthly costs through reduced transportation and utility bills from living in infill neighborhoods. Furthermore, infill households would drive roughly 18 miles less per weekday than non-infill households.

Three Housing Growth Scenarios through 2030

This report presents three housing development scenarios for the state through 2030: (i) a business-as-usual "baseline," (ii) a "medium" infill scenario, and (iii) an infill "target" scenario. All three scenarios assume that the state will build enough housing to meet projected population increases through 2030 as forecast by the state's Department of Finance. They vary only in the location and housing types that would be built.

Location: the Centers define location primarily as "infill" and "non-infill," with infill generally described as compact housing (single family or multifamily, but on small lots) on urbanized land near transit, in communities where residents do not have to drive long distances. This type of development is more environmentally beneficial than building in non-infill areas, where driving miles and energy usage are typically much higher. This study defines infill based on areas that either (i) have lower-than-average household vehicle miles traveled (VMT) or (ii) are in more car-dependent areas but within three miles of significant rail stations. These rail-adjacent areas thus have the potential to become low-VMT neighborhoods in the next 15 years.

The report further analyzes location based on coastal or inland counties and Northern versus Southern California, given that the economics of home construction and land values vary greatly among these categories.

The three scenarios project the location of all new housing development through 2030 as follows:

Scenario	Units Produced 2015-2030	Description
Baseline	1,924,832	Development follows the same patterns as 2000-2015
Medium	1,924,832	Much more development occurs in infill areas than has historically occurred
Target	1,924,832	All new development occurs in infill areas of California

Source: N/A (number comes from CA Dept of Finance household projections, adjusted upward to hold vacancy rate constant)

Housing Type: this study examines varied mixes of four different housing types across the three scenarios:

- Single-family detached
- Single-family attached & 2-4 unit buildings
- Multifamily low/midrise
- Multifamily high-rise

Generally, the Baseline Scenario has more single-family detached housing as a percentage of the overall mix, while the Medium and Target Scenarios have more multifamily.

Key Findings

Modeling the effect of these three housing scenarios on key environmental and economic indicators produces the following results:

- The Target Scenario offers at least 1.79 million metric tons of greenhouse gas reduction annually compared to the Baseline (business-as-usual) Scenario, based on reduced driving miles and household energy usage. These savings will likely be even greater when accounting for new commercial development that could occur in infill areas, as well as the potential emissions savings from not building on open space and agricultural land that currently sequesters carbon.
- The economic impacts across all three scenarios are remarkably consistent, meaning that these environmental gains can occur with virtually no negative economic impacts and potentially significant economic gains.

- The Target Scenario outperforms the Baseline and Medium Scenarios with higher annual economic growth (greater than \$800 million more per year from the Baseline scenario), more tax revenue (greater than \$5.4 million more per year), and lower overall construction costs (a savings of more than \$13 billion over 15 years).
- The Target Scenario has lower construction costs than in the Medium and Baseline Scenarios. Although slightly fewer construction jobs are needed due to this lower cost (due largely to infill units being smaller than non-infill units overall), the Target Scenario offers higher-wage construction jobs than the Baseline Scenario, resulting in approximately \$542 million more in annual residential construction job income.
- While more housing growth in the job-rich coastal cities could lead to slightly higher average home prices and rents (due to higher construction costs and land values in these locations), the average household would see lower overall monthly costs in the Target and Medium Scenarios compared to the Baseline Scenarios. Any increase in home prices and rents in these areas are offset by lower transportation and utility costs from building in infill areas. Under the Target scenario, renters still save \$26/month and homeowners save \$13/month.

The following chart summarizes these results in greater detail.

Distribution of Development Type

Scenarios	Business as Usual (BAU)				Medium				Target			
	Infill Coastal	Infill Inland	Non-infill Coastal	Non-Infill Inland	Infill Coastal	Infill Inland	Non-infill Coastal	Non-Infill Inland	Infill Coastal	Infill Inland	Non-infill Coastal	Non-Infill Inland
Single-family detached	10%	13%	12%	27%	16%	20%	6%	13%	21%	27%	0%	0%
Single-family attached & 2-4 unit	4%	1%	2%	2%	6%	2%	1%	1%	8%	2%	0%	0%
Multifamily low/midrise	16%	3%	5%	3%	24%	4%	3%	2%	33%	6%	0%	0%
Multifamily high-rise	1%	0%	0%	0%	2%	0%	0%	0%	3%	0%	0%	0%

RESULTS

Scenarios	Business as Usual	Medium	Target	Target savings over BAU
Carbon Reductions from VMT (MM tons GHGe [greenhouse gas equivalent] annually)	0%	.89	1.79	–
Average Annual Income Per New Construction Job	\$51,000	\$51,791	\$52,590	–
Total 15-Year Construction Costs	\$680,441,981,775	\$673,947,524,792	\$667,453,067,809	\$12,988,913,966
Annual Residential Construction Job Income	494,561	492,240	489,920	542,281,800
Annual Economic Growth	\$79,014,111,473	\$79,418,304,288	\$79,822,497,101	\$808,385,628
Increased Annual Tax Revenue	\$3,812,307,665	\$3,815,009,189	\$3,817,710,649	\$5,402,984
Monthly Household Utilities	\$149	\$146	\$144	(\$5)
Monthly Transportation Costs	\$1,109	\$1,080	\$1,051	(\$58)
Average Monthly Rent	\$2,666	\$2,684	\$2,702	\$36
Average Home Price	\$367,527	\$374,439	\$381,350	\$13,823
Average Monthly Mortgage Payment*	\$1,431	\$1,458	\$1,485	\$54
Total monthly renter expenses (utilities + transportation + rent)	\$3,924	\$3,911	\$3,898	(\$26)
Total monthly owner expenses† (utilities + transportation + mortgage)	\$2,573	\$2,567	\$2,560	(\$13)

* Assuming an 80% LTV, 30 year FRM at Freddie Mac January 2017 rate of 4.16%

† Not including property taxes or property insurance

Policy Recommendations

Achieving the Target Scenario or moving toward the Medium Scenario will not occur without significant policy action. Local leaders in prime infill areas should consider:

- Changing zoning to allow for more multifamily use, reduced parking requirements, and increased allowable density, while shortening overly lengthy permitting timelines;
- Implementing anti-displacement policies, such as preservation of affordable housing, tenant protection, and guarantee of lease renewal;
- Directing more funds to rail and bus rapid transit investments in infill areas and improving bus and other connections to rail and bus rapid transit, including through enhanced biking and pedestrian infrastructure; and
- Developing urban growth boundaries to protect critical open space and farmland from further development and environmental degradation, provided incentives are in place for more infill development and housing affordability.

State leaders should consider:

- Encouraging local action to permit more responsible infill development, such as through:
 - » Developing a state program modeled on Massachusetts' Chapter 40B in which local regulatory barriers to development can be overridden for housing production in municipalities that do not meet regional affordability targets;
 - » Allocating more property tax revenue to municipalities that generate housing in low VMT neighborhood types;
 - » Establishing a regional tax-sharing system with benefits to municipalities that meet regional housing goals;
 - » Creating demand-side programs for infill housing, such as rebates or down-payment assistance for homes in low-VMT neighborhood types
 - » Reducing local parking requirements in infill areas;
 - » Supporting urban growth boundaries to protect critical open space and farmland from further development and environmental degradation, provided incentives for infill development and housing affordability are simultaneously in place;

- Increasing funding for affordable housing, such as through bolstered Affordable Housing and Sustainable Communities (AHSC) funding from cap-and-trade auction proceeds and infrastructure financing programs;
- Improving transportation and transit investments in prime infill areas by:
 - » Developing transportation pricing strategies to facilitate reductions in VMT, while ensuring that low income families do not face an undue cost burden;
 - » Directing more funds to rail and bus rapid transit investments and operations in infill areas, such as the Transit and Intercity Rail Capital Program;
 - » Improving bus and other connections to rail and bus rapid transit, including through enhanced biking and pedestrian infrastructure;
 - » Developing project performance standards for all state infrastructure facilities to prioritize proposed projects based on their estimated performance reducing overall vehicle miles traveled and greenhouse gas emissions; and
- Ensuring that the California Environmental Quality Act (CEQA) provides more certainty and streamlined processing for infill projects that meet state environmental goals.

Further research should explore the financial feasibility of these scenarios, employ parcel-level analysis to help refine the conclusions offered, and expand the study to look at commercial development, as well as redevelopment opportunities. Future research could also model the effects of the policies recommended in order to identify those that would be most effective. Ultimately, California policy makers at the state and local levels will need to demonstrate a willingness to tackle housing challenges, in order to guarantee continued economic prosperity and environmental stewardship in the state.