Housing Research Brief 2

How Much Added Housing is Really Needed in Los Angeles?

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This research brief presents estimates of housing needs in Los Angeles county. Exhibits follow the same format of an earlier report, HRB 1, where we discussed housing needs in California as a whole. Interested parties should review HRB 1 for more context.

California as a whole has only averaged 83 thousand permits for new housing construction over the last 7 years, while Los Angeles county has only added 17 thousand per year. See Exhibit 1 for long-term context, since 1976, on annual rates of permitted units for new housing construction. Housing is notorious for its deep booms and busts that follow the business cycle. Low construction years in Los Angeles can fall very low—only about 5,000 in 2009—but the most recent year, 2017, only permitted 22,000 units, compared to the recent high of 27,000 in 2004 or 70,000 units permitted in 1986.

/* Exhibit 1 about here */

Realistically, how much housing do we actually need in Los Angeles county and how do we know that? In the past, USC planning scholars have carried out numerous estimates of housing needs in California using different methods. Currently our research team in the USC Price School of Public Policy is working in great detail on housing shortages and dynamics in Los Angeles county, under a project supported by the Haynes Foundation. But there has been a lot of political turmoil over the need for new construction. It might help to have another estimate of housing needs using methods that are transparent to all.

A crucial distinction when estimating housing needs is how much housing construction is needed to accommodate **expected future growth** and how much is estimated to address the **backlog of past unmet needs**.[1] Future growth can be benchmarked against population or employment projections, but the "backlog" and its timeframe requires some key assumptions.

[1] This section borrows directly from explanation in the HRB 1 California report.

a) For the present analysis, we will focus only on total housing units regardless of their size or cost, because its easiest to understand and **agree on totals first**. (Other research briefs are in preparation on rental affordability and issues of new construction.)

b) Next, let's agree on how far back in history we should go for **measuring the backlog** of unmet housing needs. Our ongoing project is using 2000 as the time from which the backlog is accumulated. Not only does that mark the beginning of the new century that we are responsible for now, but 2000 also precedes the housing bubble, the financial crisis, and the Great Recession, all of which disrupted any normal housing conditions in California. An alternative is to begin the accounting in 2006, which precedes the onset of the Great Recession, the collapse of housing construction, and the fitful recovery that followed. (The McKinsey report for the state of California began its accounting in 2005, but 2006 is the first year for which we have fully detailed data.)

c) Once the backlog is tallied, the final key assumption is **how quickly we would propose it be erased** in future years. A sizable backlog from the past that is to be accommodated in just a few future years would require a very large annual production target in addition to the needs of expected future growth. For the time being, for comparability, we will accept the 9-year catchup period used in some discussions. We present our estimates as an annual average to be attained in the 9 years between 2016 (the most recent complete data) and 2025.

With issues of timeframe settled, we turn to what particular metrics should be used when estimating the number of housing units that should have been produced each year in the past (and were not, for the backlog) and in the future (to accommodate future growth).

The Jobs to Housing Ratio

The first option is a simple jobs/housing equation, the kind people often use for a back of the envelope calculation. This answers the question, "if Los Angeles adds XX number of jobs between 2018 and 2025, how many housing units would be expected to be added, given the normal, long-run ratio of job growth to housing growth?" The jobs/housing ratio method is based on the theory that an area with job growth demands proportionally more housing. The American Planning Association recommends a ratio of 1.3 to 1.7 jobs per unit.[2] Two jobs per unit is sometimes considered an acceptable range as this assumes every housing unit is occupied by two adults, both of whom are working. Obviously, a ratio below 2.0 accounts for some units having only a single person employed, and some with none.

[2] Fairfax County Department of Planning and Zoning. (2012). Jobs-Housing Ratios: National Perspectives and Regional and Local Benchmarks. Retrieved from http://docplayer.net/13816780-Jobs-housing-ratios.html.

Relevant data for this calculation are shown in Exhibit 2, portraying the annual ratio between new housing building permits and added jobs, from 1977 to 2017. The 40-year average is 1.86 jobs per added housing units, but only 1.43 jobs per housing added in the state as a whole. One reason the ratio is higher in Los Angeles is commuting from out of county, so that some of the added jobs have workers housed in Riverside and elsewhere. This is a clear deficiency of this method when used at the local level. In the recent years since the end of the Great Recession, 2011 to 2017, the jobs-to-permits ratio is considerably higher, 5.55, compared to the long-run trend, and also higher than California, 4.93. The recent ratio is clearly abnormal in light of the 40-year time trend shown in Exhibit 2. It is distorted by both the dramatic rebound of job growth after the steep losses in 2008-10 and also by the unusually sluggish response of recent new construction.

/* Exhibit 2 about here */

We prefer to use Los Angeles's long-run ratio of job growth to housing permits in order to estimate normal housing needs. Given the actual and projected employment growth, based on the ratio of 1.86 jobs per housing, Los Angeles should have added 193 thousand housing units in the 13 years of 2005 through 2017, compared to the 179 thousand units actually added, a shortfall of 14 thousand. Based on the long-run ratio and employment projections, another 193 thousand housing permits would be expected by 2025. The sum of the shortfall and the expected new growth amounts to 207 thousand units needed, according to this method.

However, this jobs to housing ratio cannot tell the whole story of Los Angeles housing needs. Not only is commuting sending a lot of housing demand of workers out of county, but this method fails to account for nonworkers who also live in housing. With the aging of the massive baby boom generation, together with members of older generations, an increasing share of California's housing is being occupied by retirees. Housing needs cannot be based solely on job growth, and the historic ratio does not account well for our shift toward an older population.

The Housing-Demographic Model

A broader base of estimation is provided by working with the whole population.[3] In fact, the McKinsey analysis that generated housing needs estimates for California is based on a highly simplified version of a population-based analysis. The McKinsey estimate is based on the whole population undifferentiated by age group—a per capita new housing rate formed from dividing new housing units by total population growth. This per capita method counts all people equally, including children, working age adults, and retirees, and it does not account for differing household sizes of different subpopulations or for those with different generational or cultural behaviors.

[3] This section draws heavily on the discussion in HRB 1 on California's housing needs.

The most accepted method among experts for linking population and housing is the headship rate method, calculated separately by age group and sometimes also by race and Hispanic origin or even immigrant status. The headship rate measures the rate of household formation of each specified segment and can be applied to population projections that account for the changing mix of residents in an area. A key advantage of this approach is that the most reliable and available forecast data available for counties and states are population projections. This method is focused on the people resident in an area, or expected to reside, the great majority of whom need to live in housing units.

The USC housing-demographic model for estimating housing needs has a simple structure. We compare actual and expected housing occupancy to identify unmet housing needs. Further, to project housing needs in a future period, we estimate expected housing occupancy based on the future population.[4] We find the expected housing occupancy from the actual or projected population, disaggregated by age and race, multiplied by a set of headship rates calculated for specific age-race/ethnic subgroups.[5]

Headship rates vary between locales and also over time. The preferred set for housing needs calculations for Los Angeles county must be identified, limiting the data to this same county (not borrowed from the whole of California or another state). Often the preferred rates are chosen as simply those that are the **most recently available**, but other times preferred rates are chosen on other bases. Here we consider two alternatives, first the 2016 headship rates which are available from the most recent American Community Survey, and second the headship rates derived from the 2000 census.[6] These earlier rates have strategic merit because they represent the last "normal" period in the California and United States housing markets, reflecting household formation in a time preceding the distortions of the housing bubble, the financial crisis, and the Great Recession with its steep downturn in housing construction that was followed by a sluggish long recovery. The most recent headship rates, as well as homeownership and other market indicators in 2016, have not yet recovered from the deepest and most prolonged downturn since the Great Depression. As such, the 2016 rates lock-in the setbacks of a very bleak period. Accordingly, the **2000 rates deserve consideration** as representing a "normal" standard useful for defining housing needs, while the 2016 rates represent the most "recent" standard. We will evaluate both alternatives.

The data used in calculating Los Angeles's expected housing needs are presented in Exhibit 3a. These are displayed in a sequence of sections:

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[4] Population projections are produced by the Demographic Research Unit of the California Department of Finance. The projections produced in 2017 are used here.

[5] The headship rate is formed by the ratio between householders, identified by each age, race, and Hispanic origin, and the total population of each respective demographic subgroup. Every occupied housing unit has one person the Census Bureau designates the reference person or householder, defined as one of the people in whose name the housing unit is rented or owned.

[6] The earliest year with full data available from the American Community Survey is 2006.

(a) the actual and projected population counts for 2016 and 2025;
(b) actual headship rates for 2000;
(c) the actual household counts for 2016;
(d) expected households in 2016 and 2025 if the 2000 standard of headship rates is applied;
(e) actual household growth for 2000-16; and
(f) expected household growth for the same period, plus 2016-25.

/* Exhibit 3a about here */

Our estimates of housing needs begin with the data in Exhibit 3a, applying some key judgments, with results reported in Exhibit 3b. The top panel applies the 2000 "normal" standard, while the bottom panel applies the 2016 "recent" standard. Unmet housing needs are found by subtracting actual household growth (increases in occupied housing units) from what is expected based on the actual population resident in the area.[7] Future housing needs are found by applying the chosen headship rates to the future population growth.

/* Exhibit 3b about here */

Results on the lower panel, under the 2016 "recent" standard have no unmet needs because by definition the 2016 expected households equal the 2016 actual households. This standard is only applied to future growth, as shown in the last column.

Full housing needs for Los Angeles county extend beyond the number of expected occupied housing units. An additional number of housing units is required for normal vacancies (5%) and also for the gradual replacements of units lost from the total housing stock due to demolitions or conversions (roughly estimated at 0.15% per year). The size of Los Angeles county is so great with 10 million population and 3.5 million existing housing units that even small percentages add up to a large number of additional housing units. Approximately 47,000 existing housing units are likely to be replaced by 2025 in addition to the number built to house growing housing needs. And all of the new units that are added will not be occupied, due to frictional vacancies, so a 5% supplement needs to be added to newly supplied housing, whether that pertains to future growth needs or the makeup housing built to accommodate currently unmet needs.

To facilitate comparisons among the different alternative estimates under the USC housing-demographic model, each alternative is shown as an annual average to be attained in the 9 years between 2016 and 2025 (Exhibit 4). The smallest annual housing need for Los Angeles—

[7] A limitation to be noted about this method is that it depends on population residing in the area and cannot calculate the needs of people who have left the county, region or state. Under dire conditions many residents may have already been forced out and others have been blocked from moving in. There is no known method of accounting authoritatively for these displaced people and so the housing needs that are estimated apply only to residents remaining in the area.

40,000—is estimated under the 2016 standard that omits all unmet needs accumulated prior to that date.

The largest annual housing need is estimated under the 2000 "normal" standard, including both future needs and unmet needs since 2000: 79,000. If unmet needs are accumulated only since 2006, total needs to be accommodated in Los Angeles county from 2016 to 2025, including the unmet, are reduced to 60,000 per year, while if all unmet needs are ignored, future needs amount to only 41,000 per year, just 1,000 more than if the 2016 standard is applied instead of the 2000 standard (see Exhibit 4).

/* Exhibit 4 about here */

To place these estimates in better perspective, refer back to Figure 1, which portrayed the volume of annual building permits in Los Angeles county over the last 40 years. The most recent 3 years have ranged between only 20 and 23 thousand new units per year. At the height of the boom before the recession, new units only amounted to 23 to 26 thousand per year. These volumes barely equal ***half*** of the lowest estimates of needs in Exhibit 4, and neither of those low estimates made any attempt to recoup for the massive unmet needs accumulated since 2000 or 2006. If we took 60 thousand units per year as a reasonable target, that has not been accomplished in Los Angeles county since the boom of 1980-84 (Exhibit 1). The new USC housing needs estimates would call for that volume of new housing construction to continue for 9 straight years, even if we limited the unmet needs to only those since 2006.

Comparing All the Alternative Estimates of Housing Needs

The above analysis compares alternative estimates under different assumptions used within the USC Housing-Demographic method. To complete this assessment of housing needs in Los Angeles county, we bring these alongside the jobs/housing based estimate (Exhibit 5). Here we portray the different methods side-by-side, covering the past period of 2006 to 2016, and the future period to 2025. This compares the methods for exactly the same time periods without introducing any additional adjustments.

First we display the actual volume of housing permits from 2005 through 2015, supplemented by the expected future number of permits to be added if the annual permitting rate of the most recent year (21 thousand in 2017) were to be sustained out to 2025. This amounts to 362 thousand permits for the entire 20-year period, 169 thousand of which are actual permits issued 2005 through 2015. We subtract these achieved permits from the expected housing needs calculated by each of the other methods, thereby yielding an estimate of unmet housing needs through 2016.

/* Exhibit 5 about here */

Shown second are the estimates from the jobs/housing ratio method, which suggests only 24 thousand unmet units were needed by 2016, followed by 109 thousand future units to accommodate expected future growth in number of households. Thus the jobs/housing method suggests total needs (unmet + future) of 133 thousand additional units, even fewer than what would be expected if housing permits sustained their high pace of 2017 as in Method 1. As discussed above, this method is clearly not describing true needs, because it ignores the growing population of retirees without jobs and it also exports needs of some job holder in LA county outward to other counties, such as Riverside, from where LA workers are required to commute in from the neighborhoods where they finally found housing.

The third method summarizes the preferred results corresponding to the 2006 to 2025 period from the USC housing-demographic model under the 2000 "normal" standard. In addition to the actual 169 thousand housing units accumulated by actual permits, we estimate an additional 174 thousand unmet needs through 2016, with another 370 thousand units of future needs to be met. This amounts to a total housing need estimate of 544 thousand units yet to be provided, 60 thousand units per year, nearly three times the annual number permitted in LA county in the most recent year.

Conclusion

Everyone agrees there is a serious housing problem in Los Angeles, that its big and requires some big changes. Yet there really is little common understanding about the true size of the housing needs. For the state as a whole, we hear a number bandied about of 3.5 million additional housing units. This derives from a very high estimate concocted by the McKinsey consulting firm, but that figure is hard to verify, as discussed in our California housing needs report, HRB 1. At least McKinsey did not attempt to low-ball the housing problem. It truly is unprecedented in magnitude and well justifies every proposed solution that is being pursued. Our estimate for California's needs through 2025 is 2.5 million units, which also seems extremely high, but at least it is verifiable (see the HRB 1 California report).

The USC housing-demographic method lays out explicitly what are the assumptions and calculations needed to arrive at a total housing need number. Our total housing need figure for Los Angeles county under the 2000 "normal" standard, is for 544 thousand units, from 2016 through 2025, including both the needs of future population growth and unmet needs accrued since 2006. However, if we also account for the unmet needs beginning in 2000 rather than 2006, it virtually doubles the county's unmet needs, and our total estimate of housing needs balloons to 701 thousand units to be provided by 2025. Our annual estimates under different assumptions—which are crucial—are presented in Exhibit 4 for public comparison and debate.

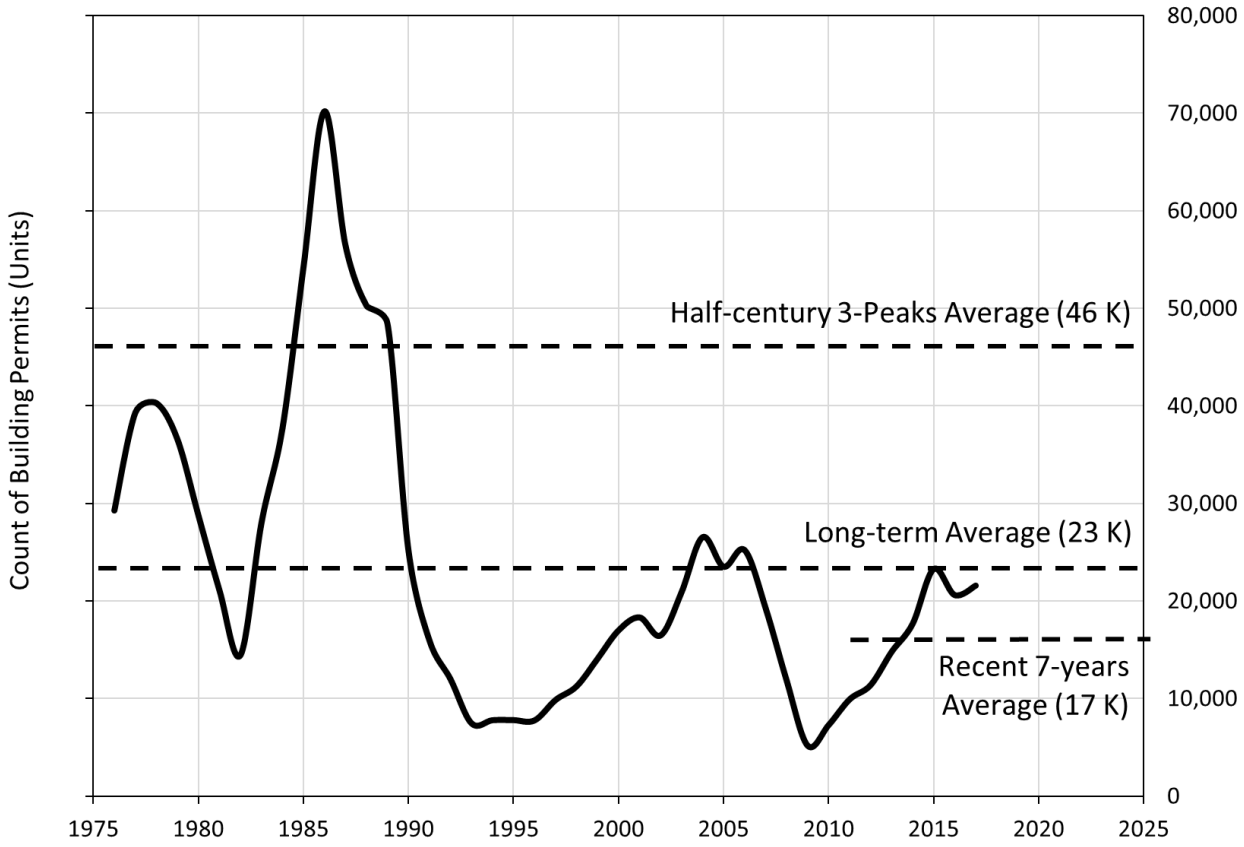
Bear in mind that these calculations, as with our California findings, pertain only to total housing unit need and do not calculate the substantial subset of need for lower-income housing. Affordable, low-income housing is an especially urgent concern and it should be prioritized within the overall goal of expanding the total size of the housing supply in Los

Angele. Nonetheless, keeping housing affordable for anyone is impossible under conditions of massive shortage. Our estimates provide an indication of the scope of the problem that leaders and citizens will need to cooperatively address.

The new series of housing research briefs addresses total housing needs, rental housing problems, displacement and housing dislodgement, and who benefits from newly built housing, with particular reference to Los Angeles but also comparing other metros. We gratefully acknowledge the kind support of the Haynes Foundation, but the authors alone are responsible for any findings and opinions expressed.

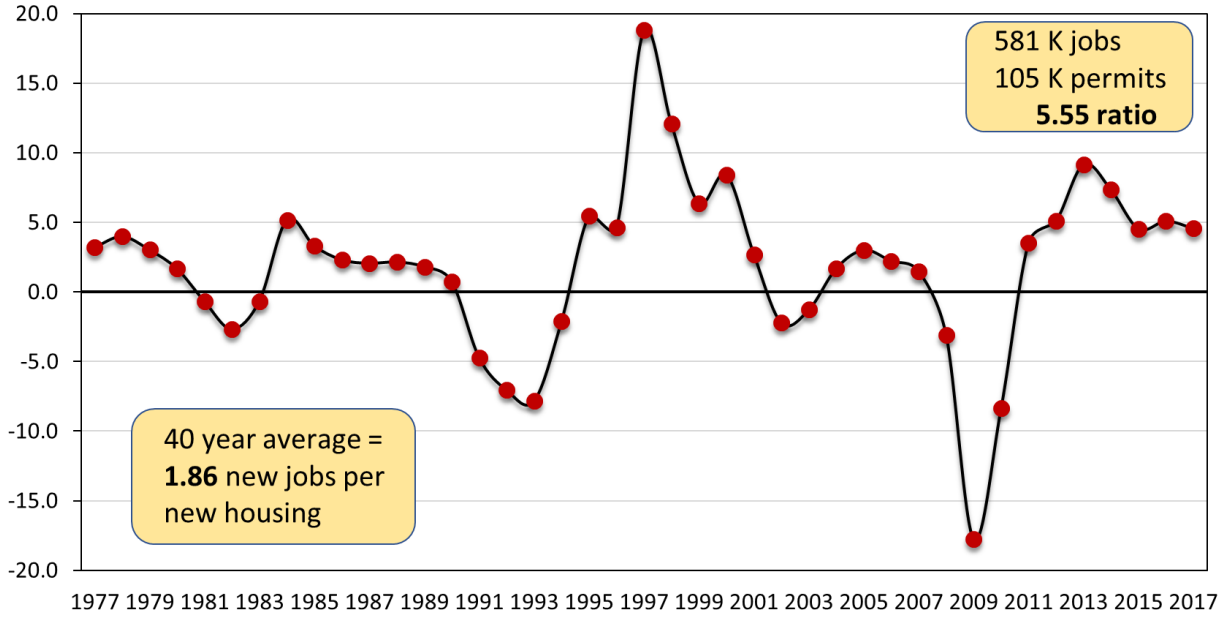
For more resources visit: https://sites.usc.edu/popdynamics/housing/

Exhibit 1. Annual Trend in Number of New Housing Construction Permits, Los Angeles County, 1976 to 2025



Source: U.S. Census Bureau, 1976-2017, Building Permits Survey.

Exhibit 2. Annual Ratio of Job Growth to Building Permits, Los Angeles County, 1977 to 2017



Note: 40-years long-term jobs/housing ratio is calculated by annual employment growth divided by annual building permits. For example, 2017 ratio = (2017 employment – 2016 employment) / 2016 building permits. This assumes 1-year time lag between permit authorization of a housing unit and actual occupancy of that unit.

Source: U.S. Census Bureau, 1977-2017, Building Permits Survey; U.S. Bureau of Labor Statistics, 1977-2017, Current Employment Statistics.

Exhibit 3a. Actual and Expected Number of Households under USC-HD Models, LA County, by Age of Householder and Race/Ethnicity (Unit: Households, %)

(a) Population of Los Angeles County by Age and Race/Ethnicity

	2016 Population							2025 Population (CA DOF v Jan. 2018)					
	Total	NH White	NH Black	NH A&PI	NH Others	Hispanic		Total	NH White	NH Black	NH A&PI	NH Others	Hispanic
Total Pop	10,139,789	2,666,983	791,068	1,477,624	283,101	4,921,013	Total Pop	10,671,800	2,791,242	796,616	1,557,048	258,261	5,268,633
Pop 15+	8,278,027	2,357,496	667,845	1,291,149	193,002	3,768,535	Pop 15+	8,873,700	2,394,504	679,152	1,361,662	191,028	4,247,354
0-14	1,861,762	309,487	123,223	186,475	90,099	1,152,478	0-14	1,798,100	396,738	117,464	195,386	67,233	1,021,279
15-24	1,391,942	254,444	106,892	164,143	44,726	821,737	15-24	1,458,096	273,147	103,894	161,959	47,405	871,691
25-34	1,611,907	417,099	119,811	237,473	47,518	790,006	25-34	1,393,121	309,636	104,240	174,989	38,030	766,226
35-44	1,392,494	336,855	98,723	218,384	30,914	707,618	35-44	1,367,977	376,028	99,113	200,221	32,963	659,652
45-54	1,385,501	394,917	117,908	213,481	27,666	631,529	45-54	1,386,791	344,971	98,185	225,454	24,836	693,345
55-64	1,184,791	411,670	108,327	207,772	21,319	435,703	55-64	1,332,780	383,387	112,612	216,641	20,764	599,376
65-74	747,958	294,209	67,998	142,116	12,170	231,465	65-74	1,075,920	372,641	92,232	200,850	16,015	394,182
75-84	384,722	164,409	35,702	73,656	7,527	103,428	75-84	604,577	236,665	48,960	122,608	8,086	188,258
85 +	178,712	83,893	12,484	34,124	1,162	47,049	85 +	254,438	98,029	19,916	58,940	2,929	74,624

(b) Headship Rates
(Households per 100 people)

	2000 Headship Rates					
	Total	NH White	NH Black	NH A&PI	NH Others	Hispanic
Total HH	44.3	54.3	53.5	41.4	43.6	38.3
15-24	10.1	14.2	12.0	10.7	13.2	8.3
25-34	40.3	49.2	48.8	35.7	45.9	36.4
35-44	48.7	54.3	53.5	44.3	52.2	45.9
45-54	53.4	58.9	59.3	50.9	57.5	50.5
55-64	55.1	62.4	67.7	50.5	55.5	49.7
65-74	55.5	64.6	69.7	43.4	59.9	49.6
75-84	59.2	68.4	73.8	47.8	69.2	51.0
85 +	50.7	61.2	60.8	42.2	48.7	41.2

(c) Actual Households

	2016 Actual Households					
	Total	NH White	NH Black	NH A&PI	NH Others	Hispanic
Total HH	3,305,587	1,189,737	314,318	486,356	79,321	1,235,855
15-24	87,642	25,891	7,229	13,089	3,432	38,001
25-34	523,027	174,765	44,217	74,095	19,277	210,673
35-44	653,795	183,209	53,273	97,239	17,160	302,914
45-54	709,927	223,851	66,597	101,575	14,965	302,939
55-64	616,911	236,469	66,212	92,999	11,937	209,294
65-74	412,250	186,899	45,709	63,783	7,687	108,172
75-84	206,572	105,049	23,055	29,772	4,213	44,483
85 +	95,463	53,604	8,026	13,804	650	19,379

(d) Expected Households under the 2000 Standard

	USC-HD-2000 2016 Expected Households							USC-HD-2000 2025 Expected Households					
	Total	NH White	NH Black	NH A&PI	NH Others	Hispanic		Total	NH White	NH Black	NH A&PI	NH Others	Hispanic
Total HH	3,628,429	1,267,970	348,641	523,970	84,663	1,403,185	Total HH	3,935,397	1,300,733	363,291	563,331	83,344	1,624,698
15-24	140,953	36,254	12,821	17,629	5,898	68,352	15-24	147,532	38,918	12,461	17,394	6,251	72,507
25-34	657,606	205,119	58,465	84,677	21,812	287,533	25-34	561,870	152,272	50,867	62,396	17,457	278,878
35-44	673,142	182,852	52,847	96,704	16,147	324,592	35-44	665,640	204,116	53,056	88,661	17,217	302,589
45-54	746,220	232,692	69,888	108,725	15,915	319,000	45-54	740,795	203,263	58,198	114,822	14,287	350,224
55-64	663,869	257,079	73,297	104,996	11,832	216,665	55-64	734,671	239,417	76,196	109,478	11,524	298,056
65-74	421,426	190,187	47,390	61,642	7,285	114,922	65-74	597,583	240,888	64,280	87,118	9,586	195,710
75-84	231,945	112,456	26,345	35,212	5,210	52,722	75-84	358,182	161,880	36,128	58,615	5,597	95,963
85 +	93,267	51,330	7,587	14,385	566	19,399	85 +	129,124	59,979	12,104	24,846	1,426	30,769

(e) Actual Household Growth

	2000 to 2016 Actual Growth					
	Total	NH White	NH Black	NH A&PI	NH Others	Hispanic
Total HH	169,377	-137,823	-20,771	119,818	-15,853	224,006
15-24	-54,470	-15,518	-7,185	-4,854	-2,663	-24,250
25-34	-115,654	-26,245	-19,038	7,742	-1,451	-76,662
35-44	-119,735	-101,018	-27,689	5,252	-6,877	10,597
45-54	82,293	-45,568	878	14,422	-4,857	117,418
55-64	220,279	41,898	16,637	43,440	979	117,325
65-74	120,630	25,797	10,430	33,553	-198	51,048
75-84	2,406	-26,653	2,891	10,876	-367	15,659
85 +	33,628	9,484	2,305	9,387	-419	12,871

(f) Expected Household Growth under the 2000 Standard

	USC-HD-2000 2000 to 2016 Expected Growth							USC-HD-2000 2016 to 2025 Expected Growth					
	Total	NH White	NH Black	NH A&PI	NH Others	Hispanic		Total	NH White	NH Black	NH A&PI	NH Others	Hispanic
Total HH	492,219	-59,590	13,552	157,432	-10,511	391,336	Total HH	299,092	38,649	15,370	38,095	-618	207,596
15-24	-1,159	-5,155	-1,593	-314	-197	6,101	15-24	4,042	1,903	-203	-174	206	2,310
25-34	18,925	4,109	-4,790	18,324	1,084	198	25-34	-80,460	-45,027	-5,747	-19,496	-3,849	-6,341
35-44	-100,388	-101,375	-28,115	4,717	-7,890	32,275	35-44	-5,967	21,305	210	-8,087	1,137	-20,533
45-54	118,586	-36,727	4,169	21,572	-3,907	133,479	45-54	-5,632	-28,311	-11,140	5,697	-1,531	29,653
55-64	267,237	62,508	23,722	55,437	874	124,696	55-64	68,654	-16,246	2,619	3,970	-311	78,622
65-74	129,806	29,085	12,111	31,412	-600	57,798	65-74	170,948	49,825	16,290	26,360	2,429	76,044
75-84	27,779	-19,246	6,181	16,316	630	23,898	75-84	111,313	46,168	8,562	19,787	313	36,484
85 +	31,432	7,210	1,866	9,968	-503	12,891	85 +	36,195	9,032	4,778	10,039	988	11,358

Source: Census 2000 5-percent IPUMS, and 2006 and 2016 ACS 1-year IPUMS.

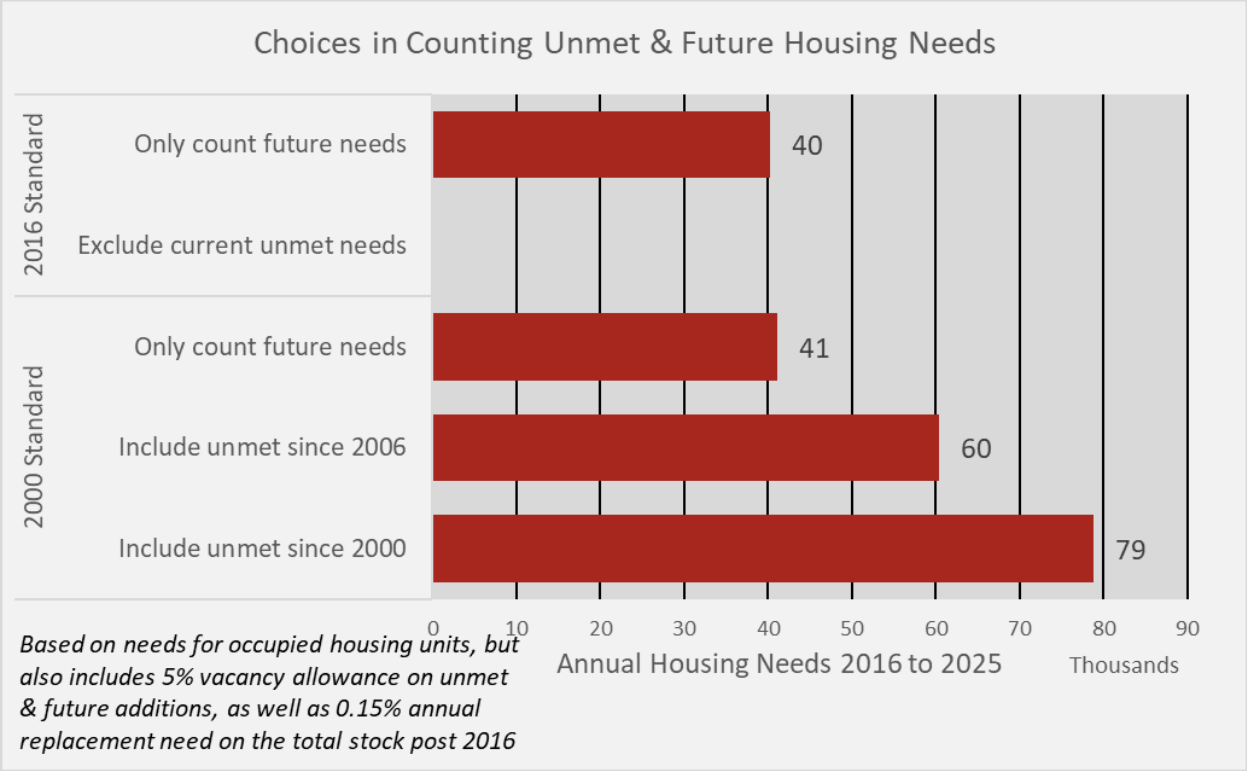
Exhibit 3b. Summary of Housing Needs by Chosen Standard (Before Stock Adjustments)

Unmet Needs under the 2000 Standard					
	Unmet = Expected - Actual			Future	TOTAL
	2000-06	2006-16	Total Unmet	2016-2025	HH NEEDS
Total	157,287	165,554	322,842	306,968	629,810
15-24	35,172	18,139	53,311	6,579	59,890
25-34	34,363	100,216	134,579	-95,736	38,843
35-44	-4,517	23,865	19,347	-7,502	11,845
45-54	19,776	16,517	36,293	-5,425	30,868
55-64	24,584	22,373	46,958	70,802	117,760
65-74	14,225	-5,049	9,176	176,157	185,333
75-84	24,656	716	25,373	126,237	151,610
85 +	9,027	-11,223	-2,196	35,857	33,661

Unmet Needs under the 2016 Standard					
	Unmet = Expected - Actual			Future	TOTAL
	2000-06	2006-16	Total Unmet	2016-2025	HH NEEDS
Total	0	0	0	299,092	299,092
15-24	0	0	0	4,042	4,042
25-34	0	0	0	-80,460	-80,460
35-44	0	0	0	-5,967	-5,967
45-54	0	0	0	-5,632	-5,632
55-64	0	0	0	68,654	68,654
65-74	0	0	0	170,948	170,948
75-84	0	0	0	111,313	111,313
85 +	0	0	0	36,195	36,195

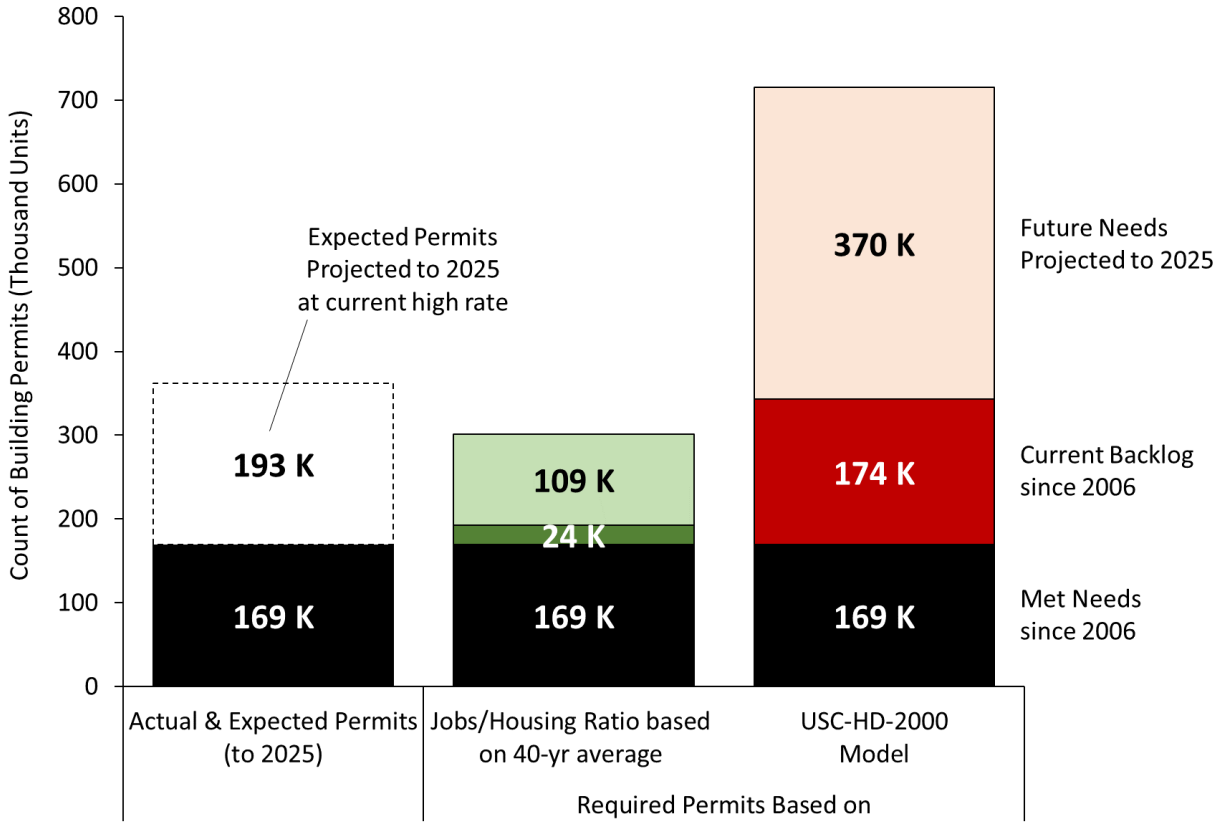
Note: These calculations of housing needs are solely based on expected household occupancies and do not include additional factors of vacancies and replacements that are needed to round out the expected housing units supplied by building permits.

Exhibit 4. Choices for Counting Annual Housing Needs in Los Angeles County, Including Vacancies and Replacements, 2016 to 2025



Source: Census 2000 5-percent IPUMS, and 2006 and 2016 ACS 1-year IPUMS.

Exhibit 5. Los Angeles County's Total Current and Future Housing Needs Compared under Alternative Methods, 2006 to 2025



Source: Census 2000 5-percent IPUMS and 2006 through 2016 ACS 1-year IPUMS; U.S. Census Bureau, 1976-2017, Building Permits Survey; U.S. Bureau of Labor Statistics, 1976-2017, Current Employment Statistics; California Employment Development Department (EDD), 2014-2024 Employment Projections.