

Re-urbanism or Bigger 'Burbs?: The Implications of Demographic Change for Housing Markets

Christopher Bitter*
University of Washington
Runstad Center for Real Estate Studies
Department of Urban Design and Planning
424 Gould Hall, Box 355740
Seattle, WA 98195-5740
206.616.5335
bitter@uw.edu

and

Andy Krause
University of Washington
Runstad Center for Real Estate Studies
Department of Urban Design and Planning
424 Gould Hall, Box 355740
Seattle, WA 98195-5740
206.616.5335
alkrause@uw.edu

* Contact Author

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Abstract: Citing demographic change as a primary driver, many housing analysts are coalescing around a vision of a dramatic shift in demand toward renting, more compact housing, and central cities. While impending changes in demographics clearly have important repercussions for housing demand, to date, relatively systematic rigorous research has confirmed this view or estimated its magnitude. In response, we construct demographically-driven housing demand projections based on evidence of the actual housing consumption behavior of more than six million households. Our results confirm that demographic change has important implications for housing demand, but unless household behavior changes substantially, demographically-driven reurbanism may be more modest than anticipated.

1 Introduction

As the nation's housing market struggles to regain its footing in the wake of an epic bubble and ensuing collapse, the battered homebuilding industry and policy makers now ponder the market's future. The outlook for the housing market is fraught with uncertainty as our nation's economic prospects remain cloudy, the future of housing finance is in doubt, and the extent to which the luster of homeownership and the desire for large homes have been tarnished by the downward spiral in home prices and negative equity have yet to be revealed.

Against this backdrop, housing analysts and planners are coalescing around a vision of a new era for the housing market, one which portends an extensive shift in housing demand away from large, single-family suburban homes and toward smaller, multifamily units in cities. Demographic change and converging generational preferences are often cited as primary drivers of the re-urbanism thesis, which suggests that the aging baby boomers will relinquish their large-lot suburban homes for condos in the city at the same time as the vast Millennial generation will begin to form households in earnest, fueling demand for smaller urban homes and apartments. This will be buttressed by continued immigration into the nation's urban cores, rapid minority population growth in cities, and the continued succession of the traditional family household by those comprised of single persons, childless couples, and unrelated individuals who will eschew the staid suburbs for the excitement of the city. If correct, the vision has important repercussions for the housing industry and cities more generally, and bodes ill for the nation's struggling suburban housing markets. Arthur Nelson, a leading proponent of the new urbanity, suggests that there is currently enough supply of large-lot suburban homes to satisfy demand through at least 2030 (Nelson 2006). The real estate industry appears to have embraced this vision,

as apartment construction in many urban-core areas is ratcheting up quickly.

Our nation's changing age and household structure as well as growing racial and ethnic diversity clearly have important implications for housing demand as a strong and well-documented relationship exists between demographics and housing consumption. However, the implications of demographic change for housing demand are complex, and relatively little academic research has sought to confirm the re-urbanism thesis or estimate its magnitude. The existing research rests heavily on preference surveys, as opposed to the analysis of actual housing market behavior. A more nuanced understanding of the implications of demographic change for housing demand would clearly benefit both the housing industry and policy makers.

The present study represents an attempt to address this shortcoming. We utilize data from the 2000 Decennial Census and the 2010 American Community Survey (ACS) Public Use Micro-data Samples (PUMS) to segment U.S. households by age, race, and household structure in order to identify actual housing consumption choices for each group in terms of tenure, structure type, unit size, and location. We then use 2020 household projections from Harvards Joint Center for Housing Studies (Masnick, McCue and Belsky 2010) as a basis to project changes in the structure of housing demand attributable to changes in demographic structure under the simplifying assumption that behavioral patterns of the recent past will continue into the next decade. Our analysis is intended to illustrate the potential influence of demographic change alone on housing demand and does not represent a housing demand forecast, as future housing demand will be influenced by a host of other factors that are beyond the scope of this paper to consider.

The projected acceleration in household growth during the present decade clearly bodes well for housing demand. Our results also suggest that changes in demographic structure have important implications for the structure of housing demand and generally support the re-urbanism thesis. However, unless household behavior changes substantially relative to the 2000s, the magnitude of the shift toward urban cores and more compact forms of housing may be more modest than generally anticipated. Moreover, we find no evidence to suggest an enduring oversupply of detached suburban homes. While demographics are important they are not destiny. We argue that other factors, such as changing household preferences, economic circumstances, and housing policy are likely to play equally definitive roles in shaping housing demand during the 2010s and beyond.

The remainder of the paper is organized as follows. In section two we discuss the link between demographics and housing consumption, detail recent and prospective demographic trends, and review the pertinent literature. We detail the data and methods employed to construct our demographically-driven housing demand projections in section three, and present our results and discuss their implications in the fourth section. We conclude with a summary and suggestions for further research.

2 Background and Literature

In order to provide a context for our empirical analysis, we begin by discussing the relationship between demographics and housing demand, then briefly document and put into perspective recent demographic trends and projections for

the next decade. We also discuss recent literature that has attempted to link demographic change to future housing demand.

2.1 Demographics and Housing Demand

Demographic characteristics such as age, race/ethnicity, and household structure have long been recognized as important determinants of housing consumption, as they shape both the number of households formed by a population and their housing needs, preferences, and ability to pay for housing. A large body of research has demonstrated the strong relationship between housing consumption and stage in the life course (Myers 1990; Gober 1992; Clark and Dieleman 1996; Masnick 2002). Emerging adults who are forming households for the first time have relatively low incomes and space needs, minimal savings, and move frequently. They typically rent apartments and are more likely to choose cities than older households. As individuals age into young adulthood many begin to form families their space needs grow and rising incomes support the purchase of small starter homes. As households mature into the middle years and children enter school, purchases of larger detached homes in the suburbs often occur, which are supported by the accumulation of home equity. Space needs decline as households enter late adulthood and children begin to leave the nest. While some downsizing may occur, mobility rates are low during late adulthood and most households continue to age in place, and homeownership rates continue to remain high into early retirement. During the later stage of life households begin to exit the housing market due to deaths and moves to live with family members or elderly care facilities. While the life course model may have lost some of its predictive power as fewer people follow the traditional path of marriage and child rearing, age and housing consumption continue to be strongly linked.

A similarly strong relationship exists between race/ethnicity and housing consumption. While the same basic life course patterns prevail across races, minority groups exhibit lower levels of housing consumption and homeownership across the age spectrum. They typically form households at a later age, tend to move more slowly into homeownership, and are more heavily concentrated in older inner-city neighborhoods than non-minorities, due to both economic circumstances and racial discrimination (Masnick 2002). Increases in minority homeownership rates are sustained later into mid-life, but the homeownership gap between whites and minorities never fully closes.

Because housing consumption varies in a somewhat predictable manner with household demographic characteristics, changes in population composition have the potential to profoundly influence the structure of housing demand, and in turn, the built environment. Myers and Pitkin (2009) demonstrate that long-term shifts in population structure have systematically altered housing demand and the shape of US cities over the past six decades. They argue that postwar suburbanization and the depopulation of inner city neighborhoods during the 1950s and 1960s was driven to a large extent by demographic change, as was the gentrification movement and urban revitalization that began in the 1970s, with the Baby Boomers playing a pivotal role. Similarly, the dearth in apartment construction during the 1990s and its resurgence during the past decade can be traced to demographic factors.

2.2 Dissecting Demographic Change

In order to understand the implications of demographic change for housing demand, it is important to first put demographic trends into perspective. Due to strong immigration and relatively high birth rates, the U.S. population has been growing at a relatively rapid pace (just less than 1% per annum) for a developed nation. Also important for housing demand, the U.S. is experiencing a significant shift in its demographic composition - it is both aging and becoming more diverse. This shift stems from differences in size between native birth cohorts, growing longevity, strong immigration, and higher fertility rates among the foreign-born population.

As Table 1 illustrates, the United States experienced a significant shift in age composition between 2000 and 2010. The number of 45 to 64 year olds swelled by nearly 20 million as the Baby Boomers replaced the smaller generation that preceded them, while the 65+ population grew by more than five million due to increasing longevity. Conversely, the number of 30 to 44 year olds declined by nearly five million as the smaller Baby Bust Generation supplanted the Boomers in this age range. The number of young and emerging adults aged 15-29 increased by six million due to the maturation of the large Baby Boom Echo Generation (aka Generation Y or the Millennials), which rivals the Baby Boom in size. Equally stark are trends in the nation's racial/ethnic composition. Non-whites accounted for an astounding 92% of the nation's growth between 2000 and 2010, and Hispanics alone for 60%. The Asian population also grew rapidly while the Non-Hispanic Black population increased at a slightly lower rate than the overall population.

Going forward, the U.S. population is expected to continue to age and become

more diverse. According to the most recent Census Bureau baseline population projections, released in 2008, the US population will expand at a slightly higher rate during the present decade and will continue to age and grow more diverse (U.S. Census Bureau, 2008). The growth projections in Table 1 are calculated by comparing the baseline 2020 projection to the actual 2010 Census count. The total population will increase by more than 32 million, which compares to 27 million during the 2000s. The number of American's over the age of 65 will expand rapidly due to increasing longevity and the aging of the Baby Boom Generation, the oldest of which reached age 65 in 2011. The number of 55 to 64 year olds will also continue to expand as the trailing half of the Baby Boom reaches this age range, but at a slower rate than during the 2000s, when the leading edge passed through. Conversely, the population of mature adults, aged 40-54, will decline as the Baby Bust supplants the Baby Boomers. The maturation of Generation Y will result in rapid growth of 25 to 39 year olds, but the number of 15 to 24 year old emerging adults will grow only modestly as the leading edge of Generation Y has already passed through this age range. Minorities, led by Hispanics, are expected to continue to drive population growth, and will account for nearly three quarters of the total increase. Conversely, the Non-Hispanic White population is anticipated to grow relatively slowly over the next ten years.

Two additional observations are relevant. The first relates to the growing differences in racial/ethnic composition between generations. More than three-quarters of the leading edge of the Baby Boomers are White while the younger Millennials are considerably more diverse. Indeed, by 2020, the 20 to 24 year old population is expected to be nearly evenly split between Non-Hispanic Whites and minorities, who represent not only children of the Baby Boomers, but also

Table 1: Summary of Population Trends

Category	Total Population				Percent of Total				Change				Percent Change	
	2000	2010	2020	2020	2000	2010	2020	2020	2000-2010	2010-2020	2000-2010	2010-2020	2000-2010	2010-2020
Total	281,421,906	308,745,538	341,386,665	341,386,665	100.0%	100.0%	100.0%	100.0%	27,323,632	32,641,127	27,323,632	32,641,127	9.7%	10.6%
0-4	19,175,798	20,201,362	22,845,536	22,845,536	6.8%	6.5%	6.7%	6.7%	1,025,564	2,644,174	1,025,564	2,644,174	5.3%	13.1%
5-9	20,549,505	20,348,657	22,731,967	22,731,967	7.3%	6.6%	6.7%	6.7%	(200,848)	2,383,310	(200,848)	2,383,310	-1.0%	11.7%
10-14	20,528,072	20,677,194	22,570,583	22,570,583	7.3%	6.7%	6.6%	6.6%	149,122	1,893,389	149,122	1,893,389	0.7%	9.2%
15-19	20,219,890	22,040,343	22,554,418	22,554,418	7.2%	7.1%	6.6%	6.6%	1,820,453	514,075	1,820,453	514,075	9.0%	2.3%
20-24	18,964,001	21,585,999	21,799,193	21,799,193	6.7%	7.0%	6.4%	6.4%	2,621,998	213,194	2,621,998	213,194	13.8%	1.0%
25-29	19,381,336	21,101,849	22,949,005	22,949,005	6.9%	6.8%	6.7%	6.7%	1,720,513	1,847,156	1,720,513	1,847,156	8.9%	8.8%
30-34	20,510,388	19,962,099	23,111,563	23,111,563	7.3%	6.5%	6.8%	6.8%	(548,289)	3,149,464	(548,289)	3,149,464	-2.7%	15.8%
35-39	22,706,664	20,179,642	22,585,773	22,585,773	8.1%	6.5%	6.6%	6.6%	(2,527,022)	2,406,131	(2,527,022)	2,406,131	-11.1%	11.9%
40-44	22,441,863	20,890,964	21,077,960	21,077,960	8.0%	6.8%	6.2%	6.2%	(1,550,899)	186,996	(1,550,899)	186,996	-6.9%	0.9%
45-49	20,092,404	22,708,591	20,501,993	20,501,993	7.1%	7.4%	6.0%	6.0%	2,616,187	(2,206,598)	2,616,187	(2,206,598)	13.0%	-9.7%
50-54	17,585,548	22,298,125	20,851,811	20,851,811	6.2%	7.2%	6.1%	6.1%	4,712,577	(1,446,314)	4,712,577	(1,446,314)	26.8%	-6.5%
55-59	13,469,237	19,664,805	21,993,542	21,993,542	4.8%	6.4%	6.4%	6.4%	6,195,568	2,328,737	6,195,568	2,328,737	46.0%	11.8%
60-64	10,805,447	16,817,924	21,008,851	21,008,851	3.8%	5.4%	6.2%	6.2%	6,012,477	4,190,927	6,012,477	4,190,927	55.6%	24.9%
65-69	9,533,545	12,435,263	17,860,508	17,860,508	3.4%	4.0%	5.2%	5.2%	2,901,718	5,425,245	2,901,718	5,425,245	30.4%	43.6%
70-74	8,857,441	9,278,166	14,451,678	14,451,678	3.1%	3.0%	4.2%	4.2%	420,725	5,173,512	420,725	5,173,512	4.7%	55.8%
75+	16,600,767	18,554,555	22,492,284	22,492,284	5.9%	6.0%	6.6%	6.6%	1,953,788	3,937,729	1,953,788	3,937,729	11.8%	21.2%
White	194,552,774	196,817,552	205,255,000	205,255,000	69.1%	63.7%	60.1%	60.1%	2,264,778	8,437,448	2,264,778	8,437,448	1.2%	4.3%
Hispanic	33,947,837	50,477,594	66,365,000	66,365,000	12.1%	16.3%	19.4%	19.4%	16,529,757	15,887,406	16,529,757	15,887,406	48.7%	31.5%
Black	35,305,818	37,685,848	41,847,000	41,847,000	12.5%	12.2%	12.3%	12.3%	2,380,030	4,161,152	2,380,030	4,161,152	6.7%	11.0%
Asian/other	17,615,577	23,764,544	27,920,000	27,920,000	6.3%	7.7%	8.2%	8.2%	6,148,967	4,155,456	6,148,967	4,155,456	34.9%	17.5%

recent immigrants and the children of immigrants. In addition, while much has been made of its diminutive size, in 2010 the Baby Bust Generation (defined here as 30 to 44 year olds), was only about 6% smaller than the fifteen year birth cohorts that came before and after them, as their numbers have been augmented through heavy immigration. It is also important to note that in absolute terms the number of Baby Boomers will contract by nearly six million during the 2010s as deaths exceed additions through immigration.

While they are the most recently available, the Census Bureau's population projections should be treated with caution as they were completed prior to the actual 2010 Census, and thus are not benchmarked to them. Indeed, the population projection for 2010 overestimated the white population by more than four million and substantially underestimated the number of Hispanics and Asians/Other. These projections also hinge on assumptions regarding fertility and mortality rates, and immigration, of which the latter is the most difficult to predict. Immigration has fallen sharply in recent years, and the immigration assumptions embedded in the baseline projection may be overly optimistic (Masnick, McCue and Belsky 2010). If the lower immigration trend persists, total population growth will fall short of the baseline projection for 2020, impacting Hispanic, Asian, and young-to-middle age adult growth most heavily.

2.3 Implications for Housing Demand

The demographic trends detailed above clearly have important implications for housing demand. Despite widespread acceptance of the importance of demographic change, there has been relatively little systematic academic work on the topic in recent years. Belsky (2009) and Masnick, McCue and Belsky (MMB)

(2010) suggest that demographic trends will support strong aggregate housing demand over the course of this decade. The MMB study projects that between 16.4 and 18.7 million new housing units will be required to accommodate projected household growth and to replace older housing stock, with the difference attributable to immigration assumptions. This represents about the same pace of housing construction that has prevailed over the last three decades. Their analysis embeds a rebound in household headship rates, which have declined in recent years, to more normalized levels.

Myers and Ryu (2008) demonstrate that demographic change also has important implications for housing tenure. Based on an analysis of age-specific home buying and home selling rates, they suggest we are in the midst of a generational housing bubble that will burst once the Baby Boomers begin to exit the owner-occupied housing market in mass. This will result in an imbalance between the number of home buyers and sellers at the national level by 2020 and in some states during the current decade. A key limitation of this study is that it considers only the impact of changing age structure. Myers and Pitkin (2009) also suggest that strong immigration will fuel demand for apartments. While neither study explicitly projects demand by product type, they suggest a looming mismatch between supply and demand because the larger, more expensive homes relinquished by the baby boomers may not be suitable for the younger, less affluent, and more diverse group of buyers whom will replace them.

This viewpoint is echoed by Arthur Nelson (2006; 2009), who argues that changes in the nation's age composition and household structure will contribute to a sizable shift in demand toward renting and more compact forms of housing, as the suburban housing developed to accommodate families with children will

no longer be suitable in an era dominated by non-family households, who have different housing needs and neighborhood preferences. Nelson (2009) projects future housing demand by applying the results of housing preference surveys to a forecast of household growth. His study suggests that roughly 44.5 million new attached and small-lot housing units will need to be built between 2007 and 2020 to accommodate demographically-driven demand, while 27 million more large lot homes currently exist than will be needed in 2020. Based on these and other factors, Nelson concludes that more than two thirds of new housing units required between now and 2020 will need to be rental units, as the Baby Boomers begin to trade their homes for apartments and the Millennials enter the rental housing market in mass. He believes this spells the end of the era of suburban sprawl and an entry into an era of renewed urbanity. Echoing this viewpoint, Doherty and Leinberger (2010) has gone so far as to suggest that the outer suburbs are poised to become the slums of our era.

While this viewpoint appears logical on the surface, it is based heavily on preference surveys as opposed to the analysis of actual housing consumption decisions, and confuses the impact of changing preferences with that of changing demographic structure. It is well known that preference surveys can be a poor indicator of real-world behavior. For example, a study by Myers and Gearin (2001) documented pent-up demand for denser forms of housing as opposed to the low-density suburban alternative more than ten years ago, and suggested that preferences for compact alternatives were likely to grow due to demographic change. However, recent evidence from the 2010 Census and American Community Survey indicates that suburban growth continued unabated during the past decade, and furthermore, that demand for large single-family homes accelerated. Minority groups in particular exhibited a growing propensity to choose

suburbs over cities and the leading edge of the Baby Boomers became, more, not less, suburbanized during the past decade.

The present research seeks to provide a more nuanced understanding of the implications of demographic change for housing demand during the current decade based on the analysis of actual housing consumption behavior, as opposed to stated preferences. Moreover, we consider the implications not only for housing tenure, but also for structure type, unit size, and location. Our analysis also considers the joint influence of changes in age, race/ethnicity, and household structure.

3 Data and Methods

In order to quantify the potential implications of demographic change for housing demand during the present decade, we derive demographically-driven housing consumption projections for the year 2020 for 220 unique demographic segments. Our analysis involves three major steps: 1) determine the housing consumption profiles for each demographic segment in 2000 and 2010, which represent the schedule of rates at which they actually consumed specific types of housing units; 2) project future housing consumption profiles for each segment based on evidence of actual housing behavior during the 2000s; and 3) apply the future housing consumption profiles to a forecast of the number of households within each demographic segment in 2020. We then use the resulting housing consumption estimates to illustrate the changes in housing demand attributable solely to demographic change.

Step one begins by identifying individual-level housing consumption profiles based on the Census Bureau's Public-Use Microdata Sample (PUMS) datasets.

Data for 2000 is a product of the 2000 decennial census long form surveys given to a subsample of the overall population. Due to a change in census survey methodology, the data for 2010 comes from the 2010 American Community Survey (ACS) an annual survey that has replaced the detailed long form sample previously included in the decennial census. These voluminous datasets represent the actual household responses to the 2000 Census by more than five million households and the 2010 ACS includes 1.2 million responses.

Both the Decennial Census and ACS data contain response fields divided into population and housing categories. The housing data has a single set of responses for each household regardless of the number of household members. The population data, on the other hand, includes information about every individual in the household (the head of household is identified). Between the housing and population subsets, the PUMS data offer over 250 separate variables. For the purposes of this study, we limited these data to the population variables concerning the household reference person's age, race/ethnicity, and household composition and those housing variables that allow us to determine the tenure type, unit size, structure type and location of the housing unit occupied by the respondent. Tenure is divided into owner and renter¹; unit size into 0-2, 3, and 4+ bedrooms; and structure type into 1 unit detached, 1 unit attached, multi-family and other; and location into high, medium, and low density as shown in Table 2.

We classified the location type of each household record based on the 2010 population density of the Public Use Microdata Area (PUMA) in which the household resided using break points of 1,000 and 5,000 persons per square mile. PUMS data are geographically coded at the level of a Public Use Microdata

Area (PUMA) contiguous groupings of census tracts that equal approximately 100,000 residents.² This clearly represents a coarser geographic scale than we prefer, but it represents the only locational information available and at least gives us the ability to ascertain the broad area type in which a household resides. The high density category (>5,000) roughly captures the central, densely developed portions of Metropolitan Statistical Areas, the medium density category (1,000 to 4,999) captures most suburban areas within MSAs and the centers of many Micropolitan Statistical Areas, and the low density category (<1,000) captures everything else, including exurban areas surrounding MSAs and rural areas. As an example, a map showing the PUMAs with their classification for the Chicago region is shown in Figure 1.

Table 2: **PUMS Housing Breakdown**

Tenure Type		Unit Size	Structure Type	Location/Pop. Density	
Name	Description	Name	Name	Name	Description
Owner	Owned	0-2 Bedrooms	1 Unit Detached	High	>5,000/mile
Renter	Rented or Free	3 Bedrooms	1 Unit Attached	Mid	between 1,000 & 5,000/mile
		4+ Bedrooms	Multi-Family	Low	<1,000/mile
			Other		

Next, we assigned each household record to one of the 220 demographic segments, cross-tabulated by age, race/ethnicity, and household composition, shown in Table 3. The survey responses in both Census datasets are the product of stratified sampling techniques which means that certain sub-populations are deliberately over-sampled in order to increase the reliability of the estimates for small and under-represented groups. As such, each housing response is assigned a weight that represents the number of total households that a particular observation represents. We summed the weighted housing consumption counts for each segment over the four housing dimensions tenure, unit size, structure type and location and divided these by the total weighted count of households to cre-

ate the housing consumption profile for that segment. For the 2000 PUMS the weights are derived directly from the census count of households and therefore the sum of all housing response weights equal the total number of households (105,480,101). For the 2010 ACS the weights do not sum (114,486,431) to the household total indicated by the 2010 Decennial Census (116,716,292).³ To remedy this we applied a scalar adjustment factor equally to all ACS weights in order to sum them to the Census total. The resulting counts of households within each demographic segment are close, but not a perfect match, to the initially released 2010 Decennial Census counts.

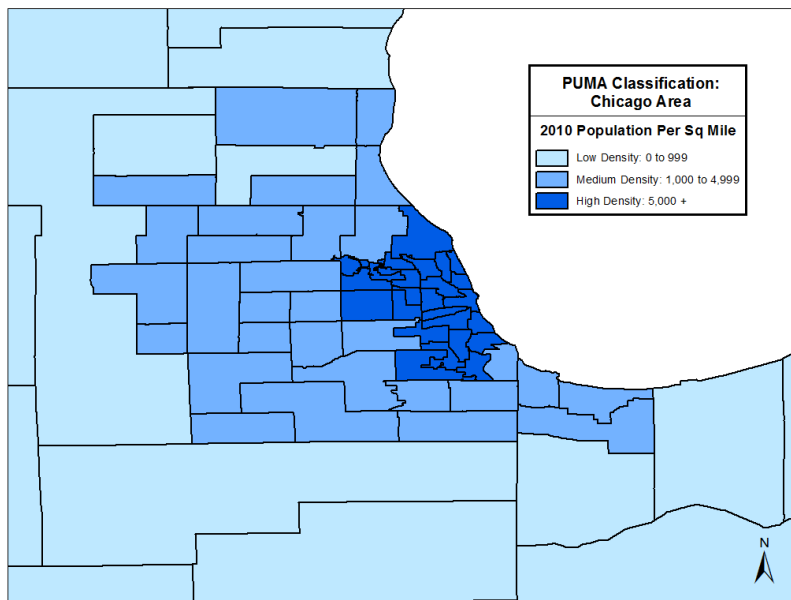


Figure 1: Example of Chicago Area PUMA Breakdown

The second step of the analysis involves projecting housing consumption profiles for each demographic segment in 2020. As with any form of forecasting,

Table 3: Comparison of Race-Age-Structure Categories

Race		Age		Household Composition	
Our	MMB	Our	MMB	Our	MMB
White	White	15-19	15-19	1. Married without Children	1. Married without Children
Hispanic	Hispanic	20-24	20-24	2. Married with Children	2. Married with Children
Black	Black	25-29	25-29	3. Single Person	3. Single Person
Asian/Other	Asian/Other	30-34	30-34	4. Other with Children	4. Partnered with Children
		35-39	35-39		4. Single Parent Living Alone
		40-44	40-44		4. Single Parent w/ Non-Relatives in House
		45-49	45-49	5. Other without Children	5. Other
		50-54	50-54		5. Partnered without Children
		55-59	55-59		
		60-64	60-64		
		65-69	65-69		
		70-74	70-74		
		75+	75+		

* Due to small sample sizes the following changes were made:
 15-19 year old groups are by race only
 65-69, 70-74 & 75+ groups are aggregated into 3 household types: Married, Single and Other

future projections rely heavily on a set of assumptions about what the future is likely to hold. One possible approach would be to construct future housing consumption profiles based on stated housing preferences as Nelson (2006; 2009) does. While preference surveys offer valuable insights into housing demand, they have not proven to be a very reliable indicator of actual housing behavior. For the purpose of this paper, we base our assumptions on evidence from actual past housing consumption decisions. This approach has its drawbacks as well, as housing behavior is shaped by many factors other than demographics and preferences do change. However, we feel that this approach best allows us to demonstrate how demographic change would influence housing demand if households within each demographic segment were to behave similarly to those of the same type of household during the past decade.

There are several possible approaches to accomplishing this objective. The simplest is to assume that each demographic segment will attain identical housing profiles in 2020 to those of the same segment in 2010. For instance, the homeownership rate for 50 to 54 year old Black households comprised of a single person was 44.3% in 2010 it could be assumed that 50 to 54 year old single Black households would also own at a rate of 44.3% in 2020. However, as Pitkin and Myers (1994) demonstrate, forecasting based on a single cross sectional measurement has a number of inherent problems. For one, households within a given age range in 2010 may have different preferences, financial endowments, and will have faced different circumstances than those ten years older. Thus their current housing consumption profiles are likely to differ from their predecessors ten years ago. Secondly, past housing choices influence future housing consumption because housing is a quasi-cumulative good in which households move through a sequence of housing types throughout the life course (Myers

1999). For example, the ability of a family to trade-up to a larger home may depend in part upon the equity accumulated through the ownership of a starter home. Moreover, inertia in housing consumption sets in as households age because mobility rates decline. For these reasons, a cross-sectional approach can lead to erroneous projections.

As Pitkin and Myers (1994) and Myers (1999) show, this problem can be addressed by taking a cohort longitudinal approach, which involves evaluating the housing consumption of the same birth cohort at multiple points in time using repeated cross sections. In essence, this allows the differences in housing consumption trajectories for each birth cohort, relative to the preceding cohort during the same age range, to carry forward through time. We follow this approach to construct our 2020 housing consumption profiles for each demographic segment utilizing cross-sectional measurements for each birth cohort during the years 2000 and 2010.

The precise method we use to calculate the 2020 housing consumption profile for a given birth cohort (stratified by race and household type) as it ages ten years between 2010 and 2020, is to take the cohorts actual housing consumption profile in 2010 and add to it the changes in consumption made by the prior birth cohort that transitioned through the same age ranges between 2000 and 2010. Mathematically this is shown as:

$$P_{i,year,cohort} = P_{i,year-10,cohort-10} + (P_{i,year-10,cohort} - P_{i,year-20,cohort-10}) \quad (1)$$

Where P_i is equal to the given housing consumption parameter (such as home-

ownership rate), year indicates the year the parameter is measured (or forecasted), cohort indicates the specific birth cohort being measured, and cohort-10 is the cohort ten years younger.⁴ So if the cohort of interest is single, Black, 60-64 year old households, then cohort-10 is equal to single, Black households ages 50-54. To illustrate with actual numbers, the current homeownership rate for single, 50-54 year old, Black households in 2010 was 35.8%. To derive the ownership rate for this cohort when it reaches the 60-64 age range in 2020, we add 3.3%, which is the actual increase in the homeownership rate for single Black households who transitioned from 50-54 to 60-64 during the period 2000 to 2010. This yields a homeownership rate projection of 39.1%, which is substantially lower than the 43.4% ownership rate that would be predicted based on the cross-sectional approach.⁵ Because these households owned at lower rates than their predecessors when they were 50-54, the cohort-based approach expects them to continue to own at lower rates when they are 60-64. A summary of our 2020 housing consumption profiles (cross-tabulated by age and race) is shown in Appendix 1.

The strength of the Cohort Approach is that it embeds differences in starting points and allows the structural trends in housing demand to carry forward into the next decade. In essence, it implies that households within each demographic segment will behave similarly to their predecessors. This is clearly a naive assumption, as housing behavior during any time period is a function of age, period, and cohort effects (Firebaugh, 1997). While age and cohort effects are demographic factors period effects are not. However, it is not possible to disentangle these effects given that we have only two cross sections with which to work. The 2000s clearly represent a unique period and the 2010s will inevitably play out differently. Despite this limitation, we feel the cohort-based

approach is the most relevant for the purpose of this study, which is to illustrate the potential implications of demographic change for housing demand under the assumption of similar behavior, rather than to produce an actual housing demand forecast. We discuss the sensitivity of our results to other behavioral assumptions later in the paper.

The final step in the analysis is to apply the future housing consumption profiles for each demographic segment derived in step two to the projected number of households within each segment in 2020, which is based on a 2010 working paper produced for the Harvard Joint Center for Housing Studies by Masnick, McCue and Belsky (MMB). This process yields separate 2020 housing consumption projections for each of the 220 demographic segments considered. We sum the housing consumption projections across all demographic segments in order to generate aggregate projections of demographically-driven housing consumption in 2020.

Before moving on to the results, we briefly describe the MMB household growth projections and how we use them. MMB produce household forecasts for 416 demographic segments at five-year intervals to 2025 by applying household headship rates from the Current Population Survey (broken down by age and race) to the Census Bureau's most recent population projections (U.S. Census Bureau 2008). They apply average headship rates over the three-year period from 2007 to 2009, rather than using the 2009 figures alone, because it increases the sample size and allows headship rates, which have declined in recent years due at least in part to the severe recession, to rebound modestly. Because recent immigration has fallen far short of the Census baseline projections, MMB produced two separate projections—one using the Census baseline projections (high-immigration

scenario), and one which halves the immigration component (low scenario). We use the midpoint between MMBs high and low scenarios for 2020 as the basis for our household forecast.⁶ In order to insure sufficient sample sizes with which to calculate housing consumption profiles we aggregated MMBs 416 categories into the 220 demographic segments shown in Table 3.

A summary of the household growth projections embedded in our analysis is shown in Table 4. They are derived by subtracting the midpoint of the MMB 2020 projections from the adjusted ACS 2010 total in each category. The projections call for an increase of approximately 15.1 million households during the 2010s or nearly four million more than the total recorded during the 2000s. The acceleration in household growth is largely attributable to the rapidly growing young adult population and rising headship rates. The projections suggest that minorities will continue to drive household growth and that the number of households headed by both young and mature adults will expand rapidly, while the number of middle-age households will contract during the decade. They also indicate that the share of households comprised of married couples, particularly those with children, will increase, which represents a reversal in trend. This stems in large part from MMBs use of averaged 2007-2009 headship rates as well as the growing share of Hispanics among young and middle-age adult households, who tend to marry and have children at higher rates than Non-Hispanic Whites. Like all demographic forecasts, these projections hinge on the assumptions embedded in them, of which headship rates and immigration are the least certain. Thus, the household growth projections embedded in our housing consumption projections represent an important source of uncertainty.

Table 4: Household Change and Projections to 2020

Category	Total			Absolute Change			Percent Change	
	2000	2010	2020	2000-2010	2010-2020	2000-2010	2010-2020	
15-24	5,372,963	4,965,209	6,484,171	(407,754)	1,518,961	-7.6%	23.4%	
25-34	18,044,177	18,090,679	21,167,641	46,502	3,076,962	0.3%	14.5%	
35-44	23,816,400	21,714,670	22,784,050	(2,101,730)	1,069,379	-8.8%	4.7%	
45-54	21,278,134	25,097,513	22,500,491	3,819,379	(2,597,022)	17.9%	-11.5%	
55-64	14,343,366	21,468,260	24,952,493	7,124,894	3,484,233	49.7%	14.0%	
65-74	11,630,396	13,486,983	19,729,496	1,856,587	6,242,512	16.0%	31.6%	
75+	10,994,665	11,892,977	14,203,172	898,312	2,310,195	8.2%	16.3%	
Non-Hispanic White	79,088,636	82,370,065	87,280,169	3,281,429	4,910,103	4.1%	5.6%	
Hispanic	9,176,120	13,522,098	18,809,367	4,345,978	5,287,269	47.4%	28.1%	
Black	11,797,973	13,718,346	16,792,109	1,920,373	3,073,763	16.3%	18.3%	
Asian	5,417,372	7,105,783	8,939,867	1,688,411	1,834,084	31.2%	20.5%	
Married with Children	24,835,505	23,349,637	26,289,988	(1,485,868)	2,940,350	-6.0%	11.2%	
Married w/o Children	29,657,727	33,411,693	39,697,287	3,753,966	6,285,594	12.7%	15.8%	
Single Person	27,230,075	32,036,778	36,941,221	4,806,703	4,904,443	17.7%	13.3%	
Other with Children	9,752,863	11,307,427	11,192,742	1,554,564	(114,686)	15.9%	-1.0%	
Other w/o Children	14,003,931	16,610,757	17,700,273	2,606,826	1,089,516	18.6%	6.2%	
Total	105,480,101	116,716,292	131,821,510	11,236,191	15,105,218	10.7%	11.5%	

4 Results and Discussion

Our illustrative demographically-driven housing demand projections are shown in Table 5. The first panel shows our projected housing consumption in 2020, which is derived by summing our projections across all 220 demographic segments, and actual housing consumption in 2010. The second and third panels depict actual and projected net absorption and the share of demand captured by each housing type, respectively. In order to isolate the impact of demographic change, the final tab decomposes the total shift in demand, defined as the difference between projected net absorption during the 2010s and actual net absorption for the 2000s, into two components. The first is a growth shift, which differentiates the change in net absorption due to growth in total households alone, assuming each housing type would capture the same demand share during the 2020s as it did during the 2000s. The second component is the compositional shift, which represents the portion of the total shift attributable to changing demographic structure - it is the residual between the total shift and the growth shift.

Our projections confirm that our nation's changing demographics have important repercussions for housing demand. The anticipated acceleration in household growth during the 2010s clearly bodes well for aggregate demand, as it would lead to an increase in net absorption by nearly four million units. In addition, if each demographic segment were to behave similarly to cohorts ten years younger during the 2000s, changes in demographic composition will alter the share of demand captured by each housing type category. The direction of the demographically-driven demand shift is consistent with the re-urbanism thesis, as rentals, multifamily dwellings, small units, and high-density areas are all projected to capture a larger share of the market, but the magnitude of

Table 5: Housing Consumption and Net Absorption Projections

	Total Consumption		Net Absorption			Demand Share		Demand Shift		
	2010	2020	2000-2010	2010-2020	2010-2020	2000-2010	2010-2020	Total	Growth	Composition
Total	116,716,292	131,821,509	11,236,191	15,105,217				3,869,026	3,869,026	
Owner	76,355,028	84,982,294	6,536,483	8,627,266		58.2%	57.1%	2,090,783	2,250,747	(159,964)
Renter	40,361,264	46,839,215	4,699,708	6,477,951		41.8%	42.9%	1,778,243	1,618,279	159,964
Detached	73,689,636	84,999,210	8,916,046	11,309,574		79.4%	74.9%	2,393,528	3,070,116	(676,588)
Attached	6,942,306	8,149,530	1,031,250	1,207,224		9.2%	8.0%	175,975	355,096	(179,122)
Multifamily	28,996,894	31,777,237	1,713,078	2,780,343		15.2%	18.4%	1,067,265	589,874	477,391
Other	7,087,457	6,895,532	(424,182)	(191,925)		-3.8%	-1.3%	232,258	(146,061)	378,319
Small	44,260,669	44,603,964	(996,060)	343,296		-8.9%	2.3%	1,339,356	(342,980)	1,682,336
Medium	47,660,276	55,853,159	6,106,839	8,192,883		54.3%	54.2%	2,086,044	2,102,805	(16,761)
Large	24,795,347	31,364,385	6,125,412	6,569,038		54.5%	43.5%	443,626	2,109,200	(1,665,575)
High	18,166,712	18,710,172	279,238	543,459		2.5%	3.6%	264,221	96,152	168,069
Mid	37,183,009	41,579,339	3,205,538	4,396,329		28.5%	29.1%	1,190,791	1,103,782	87,009
Low	61,366,570	71,531,999	7,751,414	10,165,428		69.0%	67.3%	2,414,014	2,669,092	(255,078)

these shifts is relatively modest. Moreover, demand for owner-occupied units, single-family homes, large units, and low-density areas will increase relative to the 2000s. Thus, unless housing behavior changes substantially, our results find no evidence to suggest that demographic change will result in a persistent oversupply of any of the broad housing types we consider, and the demographically-driven death of the suburban single-family home has been greatly exaggerated.

While it is true that minority households, who typically rent and occupy smaller units, multifamily dwellings, and high-density areas at higher rates than households overall, will account for the majority of household growth this trend is not new and thus will not shift demand relative to the 2000s. Conversely, the pattern of change in age structure will differ considerably from the past decade, and thus has greater potential to shift housing demand. Stronger growth in young adult households in particular, will clearly shift demand toward more compact forms of housing and high-density locations. However, the magnitude of these shifts will be offset by two countervailing forces. First, propensities to consume these types of housing declined across nearly all demographic segments during the 2000s, particularly among young adult and minority households, as Americans both up-sized and suburbanized. These trends carry forward in our cohort-based projections. In addition, the MMB household growth forecast embeds stronger growth in households comprised of married couples relative to the 2000s, both with and without children, who tend to own and occupy larger detached suburban homes at higher rates than other household types.

In order to provide a more nuanced interpretation of our aggregate results, we provide our net absorption projections disaggregated by birth cohort in Table 6. The top panel shows the actual net absorption generated by each birth

cohort during the 2000s as they transitioned between the age ranges shown in column two, which is calculated by subtracting the total housing consumption of each birth cohort in 2000 from that of the same birth cohort in 2010. The second panel shows projected net absorption during the current decade. The bottom panel shows how each birth cohort will shift net absorption during the 2010s. This is calculated by subtracting the actual net absorption attributable to households transitioning through each age range in the 2000s from the projected net absorption for those transitioning through the same ages in the 2010s. The birth cohorts representing Generation Y (born 1981 to 2000) and the Baby Boom (born 1946 to 1965) are shaded in grey. While we summarize our projections by age only for exposition purposes, it is important to note that they also embed changes in race and household structure. We present results disaggregated by both age and race/ethnicity in Appendix 2.

The pivotal role that Generation Y is poised to play in the housing market is clear from the demand projections in Table 6. The younger half of Gen Y is now entering their twenties and will begin to form households in earnest. Many older Millennials, who began to reach their twenties ten years ago, delayed household formation due in part to the severe recession. The projected recovery in headship rates and immigration will fuel their growth, and, because they are replacing smaller Gen X (born 1966 to 1980) cohorts, the total number of households in their thirties will expand rapidly. As a whole, Gen Y is projected to absorb 25 million housing units during the 2010s, which represents an increase of five million units relative to that absorbed by households transitioning into their twenties and thirties during the 2000s. However, our results indicate that, if the Gen Y birth cohorts were to attain the same housing consumption profiles in 2020 as young adults of the same ages in 2010, their contribution to

reurbanism may be more modest than generally anticipated.

The Millennials will clearly fuel growing demand for rentals and multifamily dwellings particularly during the first half of the decade. They are projected to absorb 12 million rental units - 2.7 million more than young adults absorbed during the 2000s. Nearly 60 percent of the new Millennial renter households will be minorities. However, Gen Y will absorb an even greater number of owner-occupied and detached housing units. Indeed, if they attain 2020 ownership rates similar to households of the same ages in 2010 (which are much lower than those in 2000), they will absorb nearly 13 million owner-occupied units during the decade, or 2.5 million more than were absorbed by households of the same ages during the 2000s. Seventy percent of the new Millennial homeowners will be Non-Hispanic Whites, as minorities' transition into ownership more slowly. Moreover, while Gen Y will generate a substantial increase in demand for small units, their impact on demand for housing in urban core areas is projected to be much more modest. In total, the Millennials are projected to absorb nearly 750,000 more units in high-density areas than young adult households who aged into their twenties and thirties during the 2000s but they will generate demand for 4.5 million additional units in low- and medium-density areas relative to the prior decade.

The explanation for these seemingly counter-intuitive findings is two-fold. First, the leading half of Gen Y is now reaching their thirties, a time of life which coincides with rapidly rising ownership rates and moves to larger, detached suburban homes. Hence demand for these housing types is poised to accelerate as the decade progresses. Second, while it is true that young adults choose multifamily dwellings, small units, and urban core areas at higher than average rates

Table 6: Cohort Contribution to Net Demand

Birth Cohort	Age Transition	2000-2010 Actual Net Absorption by Birth Cohort												
		Total	Owner	Renter	Detached	Attached	Multi-Family	Other	0-2 Bds	3	4+Bds	High	Mid	Low
1991-1995	5-9 to 15-19	392,056	41,950	350,106	80,631	19,461	265,728	26,236	279,201	80,266	32,589	56,405	120,782	214,870
1986-1990	10-14 to 20-24	4,573,153	687,365	3,885,588	1,206,109	246,910	2,863,647	256,447	3,145,878	1,075,619	351,656	768,699	1,512,803	2,291,651
1981-1985	15-19 to 25-29	7,885,127	2,764,834	5,120,294	3,337,009	594,803	3,551,867	401,449	4,317,186	2,738,822	829,120	1,550,843	2,669,851	3,664,434
1976-1980	20-24 to 30-34	4,832,588	3,765,862	1,066,727	4,015,429	448,495	255,933	112,732	415,373	2,967,562	1,449,653	970,655	1,647,660	2,214,274
1971-1975	25-29 to 35-39	2,291,815	3,155,831	(864,016)	3,360,791	130,082	(1,114,745)	(84,262)	(1,650,897)	1,903,984	2,038,728	114,319	709,285	1,468,212
1966-1970	30-34 to 40-44	1,378,678	2,115,446	(736,768)	2,311,121	8,311	(847,963)	(92,791)	(1,361,100)	336,483	1,138,294	(143,839)	352,270	1,170,248
1961-1965	35-39 to 45-49	748,091	1,284,429	(536,338)	1,325,657	(21,441)	(460,818)	(95,307)	(727,175)	336,480	1,138,787	(167,805)	163,649	752,248
1956-1960	40-44 to 50-54	533,022	921,564	(388,542)	760,048	21,853	(213,899)	(34,980)	(237,568)	360,691	409,899	(132,592)	52,704	612,910
1951-1955	45-49 to 55-59	148,524	499,469	(350,945)	281,963	29,919	(165,275)	1,916	(40,493)	207,265	(18,248)	(177,521)	(116,840)	442,885
1946-1950	50-54 to 60-64	41,603	323,567	(281,964)	95,593	38,194	(126,360)	34,176	53,876	127,497	(139,770)	(184,900)	(220,400)	446,903
1941-1945	55-59 to 65-69	(229,373)	(44,144)	(185,420)	(202,442)	14,697	(59,115)	17,288	23,894	(65,955)	(187,512)	(210,103)	(273,941)	254,472
1936-1940	60-64 to 70-74	(626,810)	(436,210)	(190,600)	(452,180)	(8,071)	(107,263)	(59,296)	(151,364)	(236,574)	(218,872)	(238,140)	(270,196)	(98,474)
Before 1935	65+ to 75+	(10,732,084)	(8,543,680)	(2,188,404)	(7,203,681)	(491,914)	(2,128,658)	(907,832)	(5,062,870)	(4,300,301)	(1,368,912)	(1,906,780)	(3,142,087)	(5,683,217)

Birth Cohort	Age Transition	2010-2020 Projected Net Absorption by Birth Cohort												
		Total	Owner	Renter	Detached	Attached	Multi-Family	Other	0-2 Bds	3	4+Bds	High	Mid	Low
2001-2005	5-9 to 15-19	920,623	99,580	821,043	189,359	43,870	624,091	63,302	655,026	191,406	74,191	149,123	297,703	473,797
1996-2000	10-14 to 20-24	5,563,548	848,974	4,714,574	1,474,557	303,568	3,467,290	318,133	3,821,564	1,318,124	423,800	972,359	1,873,812	2,717,377
1991-1995	15-19 to 25-29	9,467,314	3,311,674	6,155,640	4,003,906	705,052	4,247,063	511,292	5,187,629	3,277,127	1,002,558	1,853,772	3,221,641	4,391,901
1986-1990	20-24 to 30-34	6,735,121	4,862,461	1,872,660	4,939,347	582,543	858,057	355,174	1,493,658	3,556,317	1,685,145	1,355,715	2,282,427	3,096,979
1981-1985	25-29 to 35-39	3,081,027	3,885,828	(804,801)	4,432,324	171,478	(1,330,149)	(192,627)	(2,178,434)	2,619,194	2,640,267	(32,196)	972,805	2,140,418
1976-1980	30-34 to 40-44	1,612,343	2,447,663	(835,321)	2,669,456	23,059	(976,244)	(103,928)	(1,398,229)	1,197,676	2,012,896	(248,548)	465,143	1,395,747
1971-1975	35-39 to 45-49	645,389	1,397,888	(752,499)	1,330,224	(6,174)	(573,678)	(104,983)	(886,988)	475,437	1,056,941	(202,998)	149,349	699,038
1966-1970	40-44 to 50-54	140,430	843,698	(703,267)	669,069	(15,365)	(455,606)	(57,668)	(628,828)	404,092	365,166	(237,916)	(63,670)	442,017
1961-1965	45-49 to 55-59	136,634	719,752	(583,118)	472,186	(3,181)	(360,597)	28,226	(296,905)	465,941	27,598	(268,901)	(190,372)	596,107
1956-1960	50-54 to 60-64	(281,655)	324,065	(605,720)	59,396	1,121	(358,481)	16,308	(233,065)	141,174	(189,765)	(313,216)	(446,232)	477,793
1951-1955	55-59 to 65-69	(277,829)	125,306	(403,135)	(73,251)	1,056	(195,737)	(9,898)	(162,929)	26,564	(141,464)	(307,558)	(349,221)	378,949
1946-1950	60-64 to 70-74	(1,460,941)	(1,035,316)	(425,625)	(1,009,020)	(47,323)	(267,198)	(137,400)	(448,956)	(566,275)	(445,710)	(423,324)	(548,480)	(489,137)
Before 1946	65+ to 75+	(11,176,786)	(9,319,997)	(1,856,789)	(8,054,020)	(647,368)	(1,624,976)	(850,423)	(3,736,767)	(5,150,997)	(2,289,022)	(1,348,187)	(3,144,890)	(6,683,710)

Birth Cohort	Age Transition	Projected Shift in Demand attributable to Each Birth Cohort												
		Total	Owner	Renter	Detached	Attached	Multi-Family	Other	0-2 Bds	3	4+Bds	High	Mid	Low
5-9 to 15-19		528,567	57,629	470,938	108,728	24,409	358,364	37,066	375,825	111,140	41,602	92,718	176,922	258,927
10-14 to 20-24		990,395	161,409	828,986	268,448	56,658	603,643	61,646	675,686	242,505	72,204	203,660	361,008	423,726
15-19 to 25-29		1,582,186	546,840	1,035,347	666,898	110,250	695,196	109,843	870,444	538,305	173,438	302,929	531,790	727,467
20-24 to 30-34		1,902,532	1,096,599	805,933	923,918	134,047	602,124	242,442	1,078,286	588,755	235,941	385,061	634,767	882,705
25-29 to 35-39		789,212	729,997	59,215	1,071,534	41,447	(215,404)	(108,364)	(527,537)	715,210	601,539	(146,514)	263,520	672,206
30-34 to 40-44		233,605	332,217	(98,553)	358,335	14,748	(128,281)	(11,137)	(237,129)	266,192	204,601	(104,709)	112,874	225,500
35-39 to 45-49		(102,702)	113,459	(4,567)	15,267	(112,860)	(9,676)	(159,813)	138,957	(81,846)	(14,299)	(35,193)	(14,299)	(53,210)
40-44 to 50-54		(392,592)	(77,866)	(314,726)	(90,979)	(37,218)	(241,708)	(22,688)	(391,260)	43,401	(44,734)	(105,325)	(116,375)	(170,893)
45-49 to 55-59		(11,800)	220,283	(232,173)	190,223	(38,100)	(195,322)	26,310	(256,412)	198,676	45,847	(91,379)	(73,732)	153,222
50-54 to 60-64		(323,258)	498	(323,756)	(36,197)	(37,073)	(17,868)	(286,941)	13,677	(49,995)	(128,316)	(225,832)	(75,279)	30,890
55-59 to 65-69		(48,256)	169,450	(217,706)	129,191	(13,641)	(136,621)	(27,185)	(186,823)	92,518	46,048	(97,454)	(75,279)	124,477
60-64 to 70-74		(834,131)	(599,106)	(235,025)	(556,840)	(39,253)	(159,934)	(78,105)	(297,592)	(309,701)	(226,838)	(165,184)	(278,284)	(300,663)
65+ to 75+		(444,702)	(776,317)	331,615	(850,339)	(155,454)	503,682	57,408	1,326,104	(850,696)	(920,110)	558,593	(2,803)	(1,000,492)

- propensities to choose these housing types declined during the 2000s. Thus, unless they behave very differently, the case for Millennial-driven re-urbanism may be overstated.

The smaller X Generation, who will reach their forties and early fifties by the end of the decade, is projected to have a more modest impact on the housing market. The maturation of Gen X will result in a smaller pool of potential trade-up buyers, but our results suggest their impact on demand may be more modest than anticipated, as their smaller size has already left its imprint on the housing market. The number of Gen X households is projected to expand by 2.4 million by the end of the decade due to immigration and rising headship rates, which represents just 250,000 fewer households than were added to the 40 to 54 year old category during the 2000s. Moreover, if the Baby Bust behaves similarly to households of the same race, household type, and ages during the 2000s, they will generate a slight increase in net absorption of owner-occupied and detached units relative to that generated by households transitioning through the same age ranges during the 2000s. This result is attributable in part to the greater racial diversity of Gen Y relative to the Baby Boomers. While minorities own at lower rates throughout all stages of life, their ownership rates increase more rapidly than Non-Hispanic Whites during middle-age.

The Baby Boomers, who have had an outsize impact on the housing market at each stage of their lives, are projected to play a relatively modest role in shaping housing demand during the current decade. The older Boomers are beginning to retire and will reach their late sixties and early seventies by 2020. They are now nearing the zenith of their housing careers and the number of older Boomer households will soon begin to contract. The majority of those

who remain in the housing market are likely to age in place due as mobility rates are typically very low during this stage in life, thus their housing consumption profiles are unlikely to change dramatically. From this point forward the older Boomers will be subtractive from housing demand. Our projections indicate that they will relinquish 1.7 million housing units during the 2010s twice the number given back by cohorts transitioning through the same ages during the 2000s. While they unleash units of all types to the market, the vast majority, or 1.6 million, will be located in high-to-mid density areas, as those who relocate during these ages have a high tendency to move down the density hierarchy (Plane and Jurjevich 1999; Bitter and Plane 2011).

The number of younger Boomer households is expected to remain stable as they age into their late fifties and early sixties by 2020. Many will achieve empty nest status, which re-urbanism proponents contend will fuel downsizing and moves back to the city. Our analysis suggests this conclusion may be misguided unless the younger Boomers behave very differently than the older when they passed through this stage of life during the 2000s. Older Boomers ownership rates continued to increase, downsizing was only modest, and their direction of movement was highly focused on low-density areas. In sum, our results suggest the Boomers influence on the housing market may be more modest than generally anticipated; however, they are poised to reassert themselves during the 2020s as they begin to exit the housing market in mass.

The number of households in the Pre-Baby Boom Generations (born before 1946), which includes individuals who were 65 and older in 2010, is beginning to contract rapidly and elderly households are projected to relinquish nearly 11 million housing units by the end of the decade. However, this represents

only 450,000 more units than were returned by elderly households during the 2000s. The composition of these units will be roughly similar to those given back by the elderly during the prior decade, although they will be somewhat more heavily weighted toward detached homes, larger units, and low-density areas. Alternatively, the up and coming Generation Z, which we define as those born after 2000, will likely be even larger than Gen Y due the number of births accelerated during the 2000s. However, the housing careers of the oldest, now age 11, will not even begin until the end of the decade, and will have a minimal impact on the housing market.

In sum, our illustrative demographically-driven housing demand projections, which are based on the assumption that households within each demographic segment will behave similarly to those in the same segment during the 2000s, suggest that demographic change alone has relatively modest implications for the structure of housing demand during the 2010s. Thus, the demographic underpinnings of the re-urbanism thesis may be overstated. We do not argue that re-urbanism will not occur rather that it appears to be based more heavily on the premise that housing consumption behavior will change substantially relative to the past decade. Changes in housing behavior are certain to occur due to evolving preferences, economic circumstances, public policy, and housing market opportunities. Indeed, housing behavior during the 2000s was clearly influenced by extreme period effects, which are difficult to separate from age and cohort effects. Furthermore, depressed mobility rates during the late 2000s may imply that many household's 2010 housing consumption may be out of alignment with their needs and preferences. Thus housing consumption profiles may change more rapidly than normal during the current decade. We close the analysis by demonstrating the sensitivity of our projections to two alternative

behavioral scenarios.

The first scenario (A) assumes that each demographic segment will attain 2020 housing consumption profiles intermediate between those based on our cohort-based model and those based on a cross-sectional model (discussed earlier) based on 2010 housing consumption profiles. This only impacts housing consumption projections for households over the age of 35, as our cohort-based projections for younger households are estimated using the cross section. In essence, this approach gives more weight to age effects and less to period and cohort effects. It would be plausible for demand to move in this direction if housing behavior during the 2000s was more heavily influenced by unique circumstances facing households as opposed to differences in preferences across birth cohorts. As the projections in Table 7 illustrate, this scenario would lead to substantially stronger demand for multifamily dwellings, small housing units, and high-density areas, but also for owner-occupied housing.

Scenario (B) modifies our original cohort-based projections for the Gen Y cohorts only. The future behavior of the Millennials is the least certain because their housing track record is limited and the choices made by those who had established households by 2010 were heavily influenced by the housing bust and recession and may not be broadly representative of their preferences as they are skewed toward those who did not attend college. Only 13 million of the 38 million Millennial households projected by 2020 existed in 2010, and the housing choices of those who have already entered the market will be more elastic than older households due to higher young adult mobility rates. Furthermore, Gen Y has also grown up in a very different technological and social era, thus their housing needs and preferences may differ considerably from those of the Baby

Bust. In scenario (B), we assume the Millennial cohorts will achieve housing consumption profiles intermediate between those of households of the same age and type in 2005 and 2010, which reflects young adult behavior prior to, and during, the housing bust and recession.

The projections based on scenario (B) confirm that relatively small changes in Millennial behavior will have an outsized influence on aggregate housing demand. A shift toward young adult behavioral patterns in 2005 would result in much stronger demand for owner-occupied homes and small units, and moderately stronger demand for high-density areas. Thus, a relatively strong upside scenario exists for the home building industry. The ownership rates for young adults embedded in this scenario are still below those exhibited by young adults in 2000, which does not seem entirely implausible given historically high housing affordability levels, although it would clearly also depend on a stronger job market and access to credit.

Our sensitivity analysis demonstrates that even relatively modest changes in household behavior may have a strong influence on aggregate housing demand during the present decade. To the extent that housing behavior during the 2000s was more heavily influenced by unique period effects that were to normalize during the 2010s, rather than differences in cohort preferences and endowments, these scenarios may be more realistic than our base case. Both indicate stronger demand for compact housing and high-density areas results which better support the re-urbanism thesis. But both also support stronger demand for owner-occupied housing which does not. Nor do they change our more general finding that demographic change bodes well for all housing types, as projected net absorption remains positive for all and stronger relative to the 2000s for all

Table 7: Projections under Alternative Behavioral Assumptions

	Projected Net Absorption			Projected Demand Share		
	Base-Case	Scenario A	Scenario B	Base-Case	Scenario A	Scenario B
Total	15,105,217	15,105,217	15,105,217			
Owner	8,627,266	8,987,061	9,545,599	57.1%	59.5%	63.2%
Renter	6,477,951	6,118,156	5,559,618	42.9%	40.5%	36.8%
Detached	11,309,574	9,975,133	10,819,738	74.9%	66.0%	71.6%
Attached	1,207,224	1,097,129	1,074,141	8.0%	7.3%	7.1%
Multifamily	2,780,343	3,710,523	2,844,237	18.4%	24.6%	18.8%
Other	(191,925)	322,432	367,101	-1.3%	2.1%	2.4%
Small	343,296	3,510,316	1,687,233	2.3%	23.2%	11.2%
Medium	8,192,883	7,040,942	7,575,479	54.2%	46.6%	50.2%
Large	6,569,038	4,553,959	5,842,506	43.5%	30.1%	38.7%
High	543,459	1,997,317	903,950	3.6%	13.2%	6.0%
Mid	4,396,329	4,675,546	4,412,295	29.1%	31.0%	29.2%
Low	10,165,428	8,432,353	9,788,972	67.3%	55.8%	64.8%

except large units.

5 Conclusions

Our research has sought to clarify the implications of demographic change for housing demand during the present decade. This is a difficult task because future household demographics are not known with a high degree of certainty, and even if they were, their implications for housing demand are not straightforward, as they require assumptions to be made regarding future housing consumption behavior. Recognizing these limitations, we produced demographically-driven housing demand projections for the current decade for 220 demographic segments based on age, race/ethnicity, and household type in order to illustrate the potential implications of demographic change. These projections were built from a Joint Center for Housing Studies household growth forecast and assume that during the 2010s, each demographic segment will behave similarly to households of the same age and type during the 2000s, based on actual housing consumption choices recorded for more than 6 million households included in the Decennial Census and ACS PUMS data sets.

Our base-case results indicate that demographic change has important repercussions for housing demand, but our results only partially support the re-urbanism thesis. Accelerating household growth clearly bodes well for the housing market and all housing types, but changes in demographic composition portend a modest shift in demand toward more compact forms of housing. We also find that our demographically-driven housing demand projections are sensitive to behavioral assumptions. The magnitude of the demand shift toward compact housing is somewhat stronger in our alternative projections, which give more weight to age effects, as opposed to cohort effects. However, we find no evidence to sug-

gest that demographic change will result in a persistent oversupply of detached suburban housing. Thus, we argue that the impending demographically-driven death of the suburbs appears to be greatly exaggerated.

The Millennial Generation will clearly play a pivotal role in shaping housing demand during the present decade. The projected increase in young adult households, as well as those headed by minorities, will clearly drive strong demand for rentals, which suggests the nascent apartment construction boom is warranted, although we question its heavy emphasis on urban-core areas. But the Millennials will also begin to drive strong demand for owner-occupied housing during the latter half of the decade as they age into their thirties, and we find no evidence to suggest that the aging of the Baby Boom and X Generations will result in a substantial reduction in demand for suburban home ownership. In fact, our results suggest that a substantial upside scenario exists for the home building industry.

Our results do not imply that re-urbanism will not occur rather that the re-urbanism thesis rests more heavily on the premise of changing behavior than changing demographics. While demographics are important, they are not destiny, as housing behavior is shaped by many other factors. We argue that changes in housing preferences, economic circumstances, housing policy, market opportunities, and immigration are likely to play equally important roles in shaping housing demand during the present decade. The future housing choices made by the Millennial Generation, which are the least certain, will play a pivotal role in shaping housing demand as even modest changes in their behavior will have outsize impacts on the housing market.

The present research clearly has many limitations and represents only a starting point. While demographic change may have relatively modest implications at the national scale and for the broad housing types considered in this study, it clearly has potentially greater repercussions at finer geographic scales and product-type resolutions, and finer-grained research is needed to clarify these. The persistent disconnect between stated housing preferences for compact development based on surveys and actual housing behavior, also deserves greater attention. A more nuanced understanding of the factors that influence the housing choices of the Millennials and Hispanics, who will play a pivotal role, would also be of great value.

Notes

¹The 'renter' category also includes those living in a unit free of charge

²Currently both datasets are coded with the year 2000 PUMA boundaries since updated PUMA boundaries based on the 2010 Census results are not due to be released until Fall 2012

³Conversations with Census staff indicate that this difference is due to the fact that the ACS weights are based on total population numbers not total household numbers

⁴For cohorts under age 35, we use the 2010 cross-section as our projection for 2020. This is because 15-24 year olds have no prior housing history and the majority of households who will be in the 25-34 age range in 2020 had not yet formed in 2010. Thus, by using the 2010 cross-section we are assuming households under the age of 35 will make the similar initial housing choices to those of the same ages in 2010

⁵This particular form of the cohort approach represents an additive approach to forecasting. We also developed a multiplicative approach where the changes from one period to another were expressed proportionally instead of additively. Results from the multiplicative approach did not greatly differ from those of the additive and therefore we have maintained the simpler additive approach in this paper

⁶Thus our figures reflect immigration assumptions of 75% of the Census baseline projections

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7 Appendices

Appendix 1: Summary of 2020 Housing Consumption Profiles

Age-Race Cross-Tabulation	Owner	Renter	Detached	Attached	Multi-Family	Other	0-2 Beds	3 Beds	4+ Beds	High	Mid	Low
15-19 White	10.62%	89.38%	21.41%	5.05%	66.42%	7.11%	71.12%	19.86%	9.03%	7.96%	25.59%	66.45%
20-24 White	18.23%	81.77%	30.45%	5.23%	57.75%	6.57%	65.83%	25.78%	8.40%	11.69%	28.82%	59.49%
25-29 White	42.13%	57.87%	48.32%	7.17%	38.65%	5.85%	50.95%	37.72%	11.33%	13.72%	30.38%	55.90%
30-34 White	59.56%	40.44%	63.15%	6.71%	24.23%	5.91%	35.04%	44.66%	20.30%	12.46%	29.78%	57.77%
35-39 White	68.63%	31.37%	77.49%	6.21%	15.16%	1.14%	18.22%	48.05%	33.72%	9.46%	27.69%	62.85%
40-44 White	71.79%	28.21%	77.00%	5.66%	13.75%	3.59%	20.02%	44.50%	35.48%	9.24%	27.26%	63.50%
45-49 White	75.30%	24.70%	76.90%	5.05%	13.43%	4.62%	22.00%	42.84%	35.16%	8.75%	27.88%	63.37%
50-54 White	77.60%	22.40%	76.86%	4.79%	12.51%	5.84%	23.35%	44.66%	31.99%	8.04%	28.04%	63.92%
55-59 White	80.96%	19.04%	77.69%	4.39%	11.26%	6.66%	26.02%	44.72%	29.26%	7.07%	27.26%	65.67%
60-64 White	83.25%	16.75%	76.85%	4.78%	11.36%	7.01%	29.28%	45.70%	25.02%	6.73%	26.60%	66.67%
65-69 White	84.91%	15.09%	76.20%	5.23%	11.94%	6.63%	31.29%	45.60%	23.11%	7.05%	26.39%	66.56%
70-74 White	85.56%	14.44%	74.76%	6.20%	12.62%	6.43%	33.43%	46.10%	20.48%	6.81%	26.78%	66.41%
75+ White	77.92%	22.08%	65.47%	6.80%	21.58%	6.15%	42.70%	41.39%	15.91%	7.92%	28.75%	63.33%
15-19 Hispanic	11.44%	88.56%	21.57%	3.55%	66.04%	8.84%	70.89%	22.29%	6.82%	21.27%	37.71%	41.01%
20-24 Hispanic	14.43%	85.57%	26.63%	5.62%	61.26%	6.49%	69.57%	23.12%	7.31%	24.83%	38.27%	36.90%
25-29 Hispanic	25.61%	74.39%	35.87%	6.62%	50.14%	7.37%	60.27%	29.88%	9.85%	28.36%	37.50%	34.14%
30-34 Hispanic	36.44%	63.56%	44.33%	6.43%	42.32%	6.92%	49.88%	35.80%	14.32%	29.54%	37.25%	33.21%
35-39 Hispanic	44.68%	55.32%	58.16%	5.33%	28.99%	7.52%	25.87%	49.91%	24.21%	19.62%	40.04%	40.34%
40-44 Hispanic	51.30%	48.70%	60.89%	4.66%	27.98%	6.47%	21.36%	50.43%	28.21%	21.76%	39.73%	38.50%
45-49 Hispanic	56.04%	43.96%	62.33%	5.20%	26.15%	6.31%	23.58%	47.99%	28.43%	24.12%	38.37%	37.51%
50-54 Hispanic	63.85%	36.15%	65.73%	5.26%	23.38%	5.62%	22.88%	48.41%	28.71%	25.58%	38.12%	36.29%
55-59 Hispanic	64.70%	35.30%	63.36%	5.46%	24.64%	6.53%	29.38%	46.12%	24.50%	27.04%	36.33%	36.63%
60-64 Hispanic	68.12%	31.88%	64.57%	5.56%	23.82%	6.04%	30.19%	45.88%	23.94%	28.47%	34.80%	36.73%
65-69 Hispanic	66.38%	33.62%	62.50%	5.00%	26.69%	5.81%	35.40%	43.94%	20.65%	28.26%	35.87%	35.87%
70-74 Hispanic	66.83%	33.17%	60.48%	5.21%	29.21%	5.10%	37.94%	43.59%	18.47%	28.89%	35.06%	36.05%
75+ Hispanic	66.20%	33.80%	59.61%	4.92%	30.70%	4.77%	40.69%	42.41%	16.90%	31.06%	35.16%	37.78%
15-19 Black	9.27%	90.73%	17.08%	7.02%	71.72%	4.18%	74.04%	19.73%	6.23%	21.73%	40.97%	37.30%
20-24 Black	6.81%	93.19%	14.40%	5.86%	76.89%	2.86%	77.16%	17.97%	4.87%	21.68%	44.53%	33.80%
25-29 Black	15.58%	84.42%	26.79%	8.78%	61.48%	2.95%	62.68%	29.38%	7.94%	24.08%	42.42%	33.50%
30-34 Black	25.44%	74.56%	37.90%	9.92%	48.65%	3.53%	48.09%	38.79%	13.12%	25.97%	40.88%	33.16%
35-39 Black	34.27%	65.73%	50.76%	9.21%	38.10%	1.98%	31.16%	45.88%	22.96%	19.11%	42.41%	38.48%
40-44 Black	38.96%	61.04%	53.15%	9.76%	34.25%	2.84%	29.92%	45.94%	24.14%	20.17%	40.09%	39.73%
45-49 Black	48.13%	51.87%	56.25%	9.49%	31.13%	3.13%	29.79%	44.21%	26.00%	21.04%	41.85%	37.11%
50-54 Black	51.55%	48.45%	56.85%	8.07%	30.83%	4.24%	32.26%	43.86%	23.88%	21.70%	39.32%	38.98%
55-59 Black	52.66%	47.34%	55.01%	7.99%	32.17%	4.83%	36.45%	42.30%	21.25%	22.87%	39.80%	37.33%
60-64 Black	55.33%	44.67%	56.71%	7.08%	31.61%	4.60%	38.08%	40.99%	20.93%	23.78%	38.05%	38.17%
65-69 Black	58.83%	41.17%	56.95%	6.58%	31.40%	5.07%	38.21%	42.31%	19.48%	22.67%	36.32%	41.02%
70-74 Black	61.82%	38.18%	58.42%	7.02%	30.84%	3.72%	38.89%	42.66%	18.45%	24.03%	36.73%	39.25%
75+ Black	64.89%	35.11%	59.12%	7.15%	30.67%	3.06%	40.67%	41.91%	17.42%	28.21%	34.01%	37.78%
15-19 Asian/Other	12.07%	87.93%	18.70%	4.02%	74.04%	3.23%	67.57%	21.68%	10.75%	28.42%	31.45%	40.13%
20-24 Asian/Other	12.07%	87.93%	20.18%	5.86%	71.50%	2.46%	70.85%	20.97%	8.18%	30.80%	34.86%	34.34%
25-29 Asian/Other	26.14%	73.86%	28.13%	7.84%	62.12%	1.91%	65.79%	23.68%	10.53%	33.57%	36.30%	30.14%
30-34 Asian/Other	41.41%	58.59%	39.97%	9.26%	49.03%	1.74%	54.14%	27.95%	17.92%	30.01%	40.65%	29.34%
35-39 Asian/Other	56.21%	43.79%	55.18%	10.57%	34.56%	-0.31%	30.24%	37.58%	32.18%	24.97%	41.43%	33.60%
40-44 Asian/Other	65.22%	34.78%	62.11%	10.69%	26.68%	0.51%	23.44%	37.82%	38.74%	21.30%	44.17%	34.53%
45-49 Asian/Other	70.08%	29.92%	65.76%	8.80%	23.94%	1.50%	20.77%	37.71%	41.52%	23.16%	42.33%	34.51%
50-54 Asian/Other	74.09%	25.91%	68.53%	9.19%	20.27%	2.01%	18.02%	40.18%	41.79%	25.66%	39.44%	34.90%
55-59 Asian/Other	74.94%	25.06%	67.42%	7.75%	20.48%	4.35%	20.41%	40.82%	38.77%	22.59%	40.14%	37.27%
60-64 Asian/Other	75.84%	24.16%	67.80%	8.40%	20.75%	3.05%	22.04%	41.27%	36.69%	29.23%	36.29%	34.47%
65-69 Asian/Other	76.60%	23.40%	67.07%	7.59%	21.58%	3.76%	24.11%	42.07%	33.82%	27.45%	36.16%	36.39%
70-74 Asian/Other	74.96%	25.04%	65.74%	8.10%	22.93%	3.23%	27.19%	40.19%	30.27%	30.27%	35.19%	34.54%
75+ Asian/Other	65.61%	34.39%	59.97%	6.16%	30.57%	3.30%	35.50%	37.34%	27.16%	34.14%	32.58%	33.27%

Appendix 2a: White and Hispanic Detailed Consumption Shifts

2000 - 2010 Actual Net Absorption by Birth Cohort - White															
Gen	Birth Cohort	Age Transition	Total HHs	Owner	Renter	Detached	Attached	Multi-Family	Other	0-2 Bds	3 Bds	4+Bds	High	Mid	Low
Y	1986-1995	5-14	3,036,838	520,866	2,515,972	890,771	158,170	1,792,235	195,652	2,017,961	759,601	259,276	355,196	874,864	1,806,778
	1976-1985	15-24	7,384,391	4,742,673	2,641,718	594,633	2,041,068	280,742	2,204,190	3,692,982	1,487,219	1,048,716	2,227,538	4,108,137	4,108,137
X	1966-1975	25-34	1,204,648	3,010,333	3,202,489	(36,152)	(1,702,437)	(259,082)	(2,318,920)	1,085,571	2,437,997	37,324	(301,980)	37,324	1,469,304
	1956-1965	35-44	244,283	956,859	(712,546)	(8,120)	(469,804)	(142,025)	(463,539)	(40,090)	747,912	(243,485)	(240,094)	(240,094)	727,862
	1946-1955	45-54	(141,820)	312,029	(453,879)	(37,516)	84,111	(203,549)	15,134	251,338	(3,381)	(389,777)	(223,148)	(453,274)	534,602
	Before 1946	55-64	(10,020,588)	(8,164,185)	(1,856,403)	(7,065,458)	(335,479)	(1,735,180)	(884,471)	(4,120,966)	(4,239,912)	(1,659,710)	(1,547,388)	(3,256,146)	(5,217,054)
2010 - 2020 Actual Net Absorption by Birth Cohort - White															
Y	1996-2005	5-14	3,499,520	607,360	2,892,160	1,029,228	182,343	2,055,722	232,227	2,324,896	878,272	296,352	394,236	995,605	2,109,680
	1986-1995	15-24	9,623,791	5,996,984	3,626,806	6,234,177	718,725	2,121,734	549,134	3,351,938	4,487,480	1,784,372	1,296,146	2,930,562	5,397,083
X	1976-1985	25-34	2,565,422	4,004,534	(1,439,113)	4,424,065	39,540	(1,570,750)	(327,434)	(2,219,308)	1,811,261	2,973,468	(194,097)	401,808	2,357,710
	1966-1975	35-44	698,320	1,289,633	(591,313)	1,157,582	13,189	(366,762)	(105,689)	(370,967)	344,793	724,494	(116,057)	(52,469)	866,846
	1956-1965	45-54	139,573	827,840	(688,267)	433,960	51,222	(395,251)	46,642	86,443	338,801	(285,671)	(283,652)	(569,592)	992,817
	1946-1955	55-64	(10,042,847)	(8,296,486)	(1,746,360)	(7,288,715)	(367,692)	(1,526,445)	(859,994)	(3,406,684)	(4,494,247)	(2,141,915)	(1,408,009)	(3,346,138)	(5,288,700)
Projected Shift in Demand Attributable to Each Birth Cohort - White															
Y	1996-2005	5-14	462,682	86,494	376,188	138,447	24,173	263,487	36,575	306,935	118,671	37,076	39,040	120,741	302,902
	1986-1995	15-24	2,239,400	1,254,311	985,088	1,156,769	124,092	690,146	268,392	1,147,748	794,498	297,153	247,430	703,024	1,288,946
X	1976-1985	25-34	1,360,774	994,201	366,572	1,221,576	75,862	131,987	(68,352)	99,612	725,690	535,471	107,883	364,484	888,406
	1966-1975	35-44	454,037	332,804	121,233	283,320	31,339	103,042	36,336	92,572	384,883	(23,418)	127,428	187,625	138,984
	1956-1965	45-54	281,393	515,781	(234,388)	471,476	(29,889)	(191,702)	31,508	(164,849)	342,182	104,106	(60,504)	(116,318)	458,215
	1946-1955	55-64	(22,259)	(132,301)	110,043	(223,257)	(32,213)	208,735	24,477	714,282	(254,335)	(482,205)	(139,379)	(89,992)	(71,646)
2000 - 2010 Actual Net Absorption by Birth Cohort - Hispanic															
Gen	Birth Cohort	Age Transition	Total HHs	Owner	Renter	Detached	Attached	Multi-Family	Other	0-2 Bds	3 Bds	4+Bds	High	Mid	Low
Y	1986-1995	5-14	800,947	108,075	692,872	205,409	42,908	500,247	52,383	563,806	180,439	56,702	199,366	306,521	295,060
	1976-1985	15-24	2,373,920	828,232	1,545,688	1,070,019	155,323	987,371	161,207	1,123,087	904,825	346,008	683,694	899,391	796,835
X	1966-1975	25-34	1,044,349	864,445	179,904	982,168	28,328	(26,551)	60,404	(298,047)	807,370	535,026	138,575	439,762	466,012
	1956-1965	35-44	285,182	403,218	(118,036)	393,168	(8,385)	(103,548)	3,947	(329,003)	322,143	292,042	(45,160)	147,767	182,575
	1946-1955	45-54	14,285	118,244	(103,959)	82,223	(17,458)	(39,352)	8,872	(155,163)	118,381	51,067	(65,450)	16,388	63,347
	Before 1946	55-64	(431,044)	(236,494)	(194,550)	(215,473)	(37,513)	(155,307)	(22,751)	(354,454)	(57,707)	(18,888)	(238,096)	(99,339)	(93,609)
2010 - 2020 Actual Net Absorption by Birth Cohort - Hispanic															
Y	1996-2005	5-14	1,551,740	214,959	1,336,781	398,157	81,101	964,785	107,696	1,083,442	356,316	111,982	374,709	592,146	584,884
	1986-1995	15-24	3,046,858	1,090,364	1,956,494	1,341,205	208,075	1,275,212	222,365	1,550,787	1,085,782	410,288	915,054	1,131,502	1,000,301
X	1976-1985	25-34	999,088	1,045,574	(46,487)	1,233,632	2,516	(307,818)	70,757	(773,060)	1,057,917	714,230	(70,771)	479,622	590,236
	1966-1975	35-44	225,043	563,046	(338,003)	528,550	(19,511)	(273,929)	(10,068)	(562,249)	420,208	367,084	(150,446)	141,653	233,836
	1956-1965	45-54	121,066	296,409	(175,343)	226,243	(16,924)	(113,046)	24,792	(216,907)	244,921	93,052	(94,999)	49,808	166,256
	1946-1955	55-64	(398,183)	(181,767)	(216,416)	(166,107)	(40,817)	(167,737)	(23,522)	(373,916)	(13,978)	(10,290)	(289,433)	(62,202)	(46,548)
Projected Shift in Demand Attributable to Each Birth Cohort - Hispanic															
Y	1996-2005	5-14	750,793	106,884	643,909	192,748	38,193	464,538	55,133	519,636	175,877	55,280	175,343	285,625	289,824
	1986-1995	15-24	672,938	262,132	410,806	271,486	52,752	287,841	61,158	427,700	180,957	64,280	231,360	238,111	203,466
X	1976-1985	25-34	(45,262)	181,129	(226,391)	251,464	(25,812)	(281,267)	10,353	(475,013)	250,547	179,204	(209,346)	39,860	124,224
	1966-1975	35-44	(60,139)	159,828	(219,967)	135,382	(11,126)	(170,381)	(14,015)	(233,246)	98,065	75,042	(105,286)	(6,114)	51,261
	1956-1965	45-54	106,781	178,165	(171,384)	144,020	534	(53,694)	15,920	(61,744)	126,540	33,420	(29,549)	33,420	102,909
	1946-1955	55-64	32,861	54,727	(21,866)	49,366	(3,304)	(12,430)	(771)	(19,462)	43,729	8,593	(51,337)	37,137	47,061

Appendix 2b: Black and Asian/Other Detailed Consumption Shifts

2000 - 2010 Actual Net Absorption by Birth Cohort - Black															
Gen	Birth Cohort	Age Transition	Total HHs	Owner	Renter	Detached	Attached	Multi-Family	Other	0-2 Bds	3 Bds	4+ Bds	High	Mid	Low
Y	1986-1995	5-14	676,284	45,435	630,849	96,614	40,538	519,193	19,939	523,444	121,170	31,070	145,733	298,582	231,969
X	1976-1985	15-24	1,568,834	391,680	1,177,154	630,571	166,679	728,376	43,208	674,102	676,236	218,496	392,373	659,585	516,876
	1966-1975	25-34	530,919	530,729	190	659,133	48,141	(178,078)	1,723	(308,408)	464,427	374,900	27,195	207,072	296,652
Boom	1956-1965	35-44	166,106	247,119	(81,013)	249,288	(3,447)	(63,873)	(15,862)	(95,110)	97,195	164,021	(45,543)	98,782	112,867
	1946-1955	45-54	(34,307)	26,551	(60,858)	33,833	(21,377)	(38,184)	(8,579)	(75,050)	5,568	35,175	(82,358)	(5,489)	55,540
Pre-Boom	Before 1946	55-64	(1,249,552)	(758,903)	(490,649)	(693,329)	(114,350)	(390,035)	(51,838)	(662,016)	(443,017)	(144,519)	(503,440)	(368,635)	(377,477)
		65+													
2010 - 2020 Actual Net Absorption by Birth Cohort - Black															
Y	1996-2005	5-14	951,939	68,198	883,741	140,731	57,373	724,825	29,010	730,277	173,467	48,195	206,419	418,983	326,536
X	1986-1995	15-24	2,441,400	605,644	1,835,756	924,875	252,266	1,182,514	81,745	1,185,989	952,567	302,844	636,699	998,076	806,625
	1976-1985	25-34	947,095	721,916	225,179	944,123	91,435	(90,292)	1,828	(278,360)	702,658	522,796	54,103	385,514	507,477
Boom	1966-1975	35-44	134,120	324,540	(190,421)	296,243	1,129	(150,361)	(12,892)	(187,773)	140,166	181,727	(81,093)	78,507	136,706
	1956-1965	45-54	79,157	160,935	(81,778)	158,139	(22,502)	(58,731)	2,251	(94,355)	90,615	82,897	(94,984)	39,435	134,705
Pre-Boom	1946-1955	55-64	(1,217,857)	(708,988)	(508,869)	(666,113)	(114,907)	(378,360)	(58,477)	(613,005)	(436,941)	(167,912)	(505,232)	(379,395)	(333,230)
		65+													
Projected Shift in Demand Attributable to Each Birth Cohort - Black															
Y	1996-2005	5-14	275,655	22,763	252,892	44,117	16,835	205,632	9,071	206,833	52,297	16,525	60,686	120,401	94,367
X	1986-1995	15-24	872,566	213,964	658,602	294,304	85,587	454,138	38,537	511,887	276,331	84,348	244,326	338,491	289,749
	1976-1985	25-34	416,176	191,187	224,989	284,990	43,294	87,786	105	30,048	238,231	147,896	26,908	178,442	210,825
Boom	1966-1975	35-44	(31,987)	77,421	(109,408)	46,955	4,576	(86,488)	2,970	(92,663)	42,971	17,706	(35,550)	(20,275)	23,839
	1956-1965	45-54	113,464	134,384	(20,920)	124,306	(1,125)	(20,547)	10,830	(19,305)	85,047	47,722	(12,626)	44,924	81,165
Pre-Boom	1946-1955	55-64	31,695	49,915	(18,220)	27,216	(557)	11,675	(6,639)	49,011	6,076	(23,393)	(1,792)	(10,760)	44,247
		65+													
2000 - 2010 Actual Net Absorption by Birth Cohort - Asian/Other															
Gen	Birth Cohort	Age Transition	Total HHs	Owner	Renter	Detached	Attached	Multi-Family	Other	0-2 Bds	3 Bds	4+ Bds	High	Mid	Low
Y	1986-1995	5-14	356,280	41,202	315,078	69,353	19,666	257,913	9,348	254,432	72,592	29,256	109,045	122,408	124,827
X	1976-1985	15-24	1,044,949	425,542	619,407	410,468	101,339	522,837	10,305	562,373	304,047	178,529	330,220	420,784	293,945
	1966-1975	25-34	475,719	608,484	(132,765)	560,067	72,817	(152,956)	(4,209)	(217,166)	305,080	387,805	37,544	239,748	198,427
Boom	1956-1965	35-44	106,055	254,926	(148,871)	233,858	5,185	(127,347)	(5,641)	(224,155)	115,708	214,502	(36,965)	54,042	88,978
	1946-1955	45-54	(58,182)	46,138	(104,320)	7,469	(111)	(60,559)	(4,981)	(143,501)	34,174	51,145	(50,050)	(21,167)	13,035
Pre-Boom	Before 1946	55-64	(372,166)	(245,475)	(126,691)	(208,597)	(26,629)	(113,927)	(23,013)	(250,894)	(87,111)	(34,161)	(152,430)	(105,256)	(114,480)
		65+													
2010 - 2020 Actual Net Absorption by Birth Cohort - Asian/Other															
Y	1996-2005	5-14	480,973	58,037	422,936	95,801	26,621	346,049	12,502	337,976	101,476	41,521	146,118	164,781	170,074
X	1986-1995	15-24	1,185,247	495,081	690,166	467,578	113,618	585,426	18,623	658,009	329,698	197,539	377,351	475,138	332,757
	1976-1985	25-34	527,388	704,036	(176,648)	663,970	86,370	(199,925)	(22,988)	(337,129)	373,327	491,189	(3,486)	287,217	243,657
Boom	1966-1975	35-44	143,195	321,653	(178,458)	284,973	9,031	(140,918)	(9,891)	(264,283)	147,382	260,097	(24,173)	55,637	111,731
	1956-1965	45-54	(5,330)	102,534	(107,863)	48,369	8,353	(62,195)	143	(158,088)	74,994	77,765	(37,726)	(600)	32,997
Pre-Boom	1946-1955	55-64	(361,636)	(226,007)	(135,629)	(193,215)	(23,699)	(119,440)	(25,282)	(264,780)	(63,502)	(33,354)	(156,145)	(108,888)	(96,603)
		65+													
Projected Shift in Demand Attributable to Each Birth Cohort - Asian/Other															
Y	1996-2005	5-14	124,693	16,835	107,858	26,448	6,955	88,136	3,154	83,544	28,884	12,265	37,073	42,373	45,247
X	1986-1995	15-24	140,298	69,539	70,759	57,110	12,279	62,589	8,318	95,636	25,651	19,010	47,131	54,354	38,812
	1976-1985	25-34	51,669	95,552	(43,883)	103,863	13,553	(66,969)	(18,779)	(119,963)	68,247	103,384	(41,030)	47,469	45,230
Boom	1966-1975	35-44	37,140	66,727	(29,587)	51,115	3,846	(13,571)	(4,250)	(40,128)	31,674	45,595	(12,792)	1,595	22,753
	1956-1965	45-54	52,853	56,396	(3,543)	40,900	8,464	(1,636)	5,124	(14,587)	40,820	26,620	(12,324)	20,567	19,962
Pre-Boom	1946-1955	55-64	10,530	19,468	(8,938)	15,382	2,930	(5,513)	(2,269)	(13,886)	23,609	807	(3,632)	(3,632)	17,877
		65+													