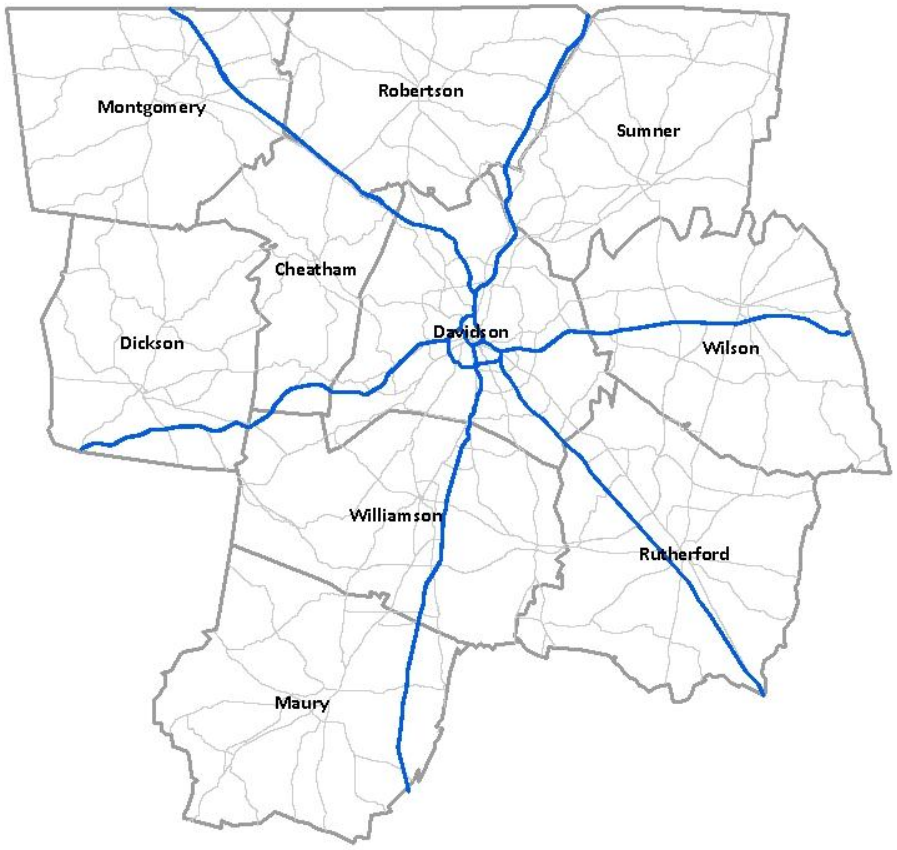
GREATER NASHVILLE

Trends, Preferences and Opportunities

2010 to 2025 and to 2040



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EXECUTIVE SUMMARY

This report is prepared on behalf of ten counties comprising Greater Nashville, Tennessee. They include the central county of Davidson and the suburban counties of Cheatham, Dickson, Maury, Montgomery, Robertson, Rutherford, Sumner, Wilson and Williamson (see Figure A). Between 2010 and 2040, Greater Nashville will grow from 1.8 million to 3.1 million residents, or nearly 80%. This is more than twice the nation's growth, which is projected to be about 30%. About 1.2 million households will be added. More than 800,000 space-occupying jobs will also be added requiring about 400 million more square feet of enclosed space than existed in 2010. With more than 800 million square feet of space replaced there will be about 1.2 billion square feet of nonresidential development to 2040 representing about 2.3 times the total enclosed nonresidential space supported in 2010.

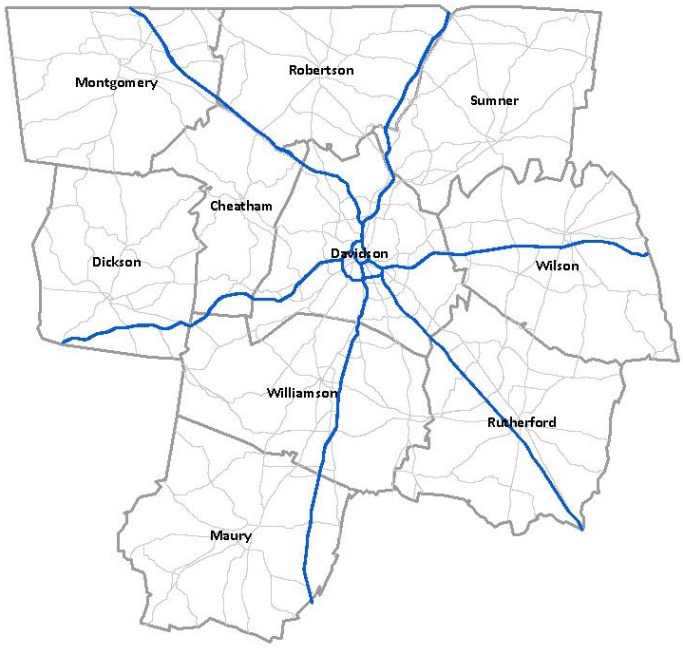

Figure A
Counties comprising Greater Nashville

Growth will vary between the counties. Davidson County, the center of Greater Nashville, will grow by about 240,000 people or 43% while the surrounding suburban counties will add 1.1 million new people. While Davidson County will add more than 300,000 jobs, the suburban counties will add more than 500,000. And while Davidson County will see more than 450 million square feet of total nonresidential space construction representing 1.5 times the space that existed in 2010, the suburban counties will see nearly 750 million square feet of nonresidential space construction representing more than 3 times the space existing in 2010.

There will be other important changes between 2010 and 2040.

- About a third of the change in Greater Nashville population between 2010 and 2040 will be attributable to seniors. The share will be about 36% in Davidson County and 24% in the suburban counties.

- The "new majority" (comprising all racial and ethnic minorities) will account for nearly 60% of the growth in Greater Nashville, but it will account for all of the growth in Davidson County and more than 40% of the growth among suburban counties.

- Between 2010 and 2040, households with children in Greater Nashville will comprise about 28% of the total change in households while households without children will comprise the remaining 72%. The figures for Davidson County are 19% and 81% respectively, while for the suburban counties those figures are 30% and 70% respectively.

- Single-person households will account for about 34% of the total change in Greater Nashville but nearly half the change in Davidson County and 32% of the change in the suburban counties.

As seen in Figure B, households with occupants in the peak earning years, between 35 and 64, accounted for about 69% of the growth in households in Greater Nashville between 1990 and 2010. Over the next 30 years, that same group will account for just 41% of the change in housing demand. Starter households (where householders are under 35 years of age) will account for 23% of the household growth while senior households (where householders are 65+) will comprise the remaining 36%.

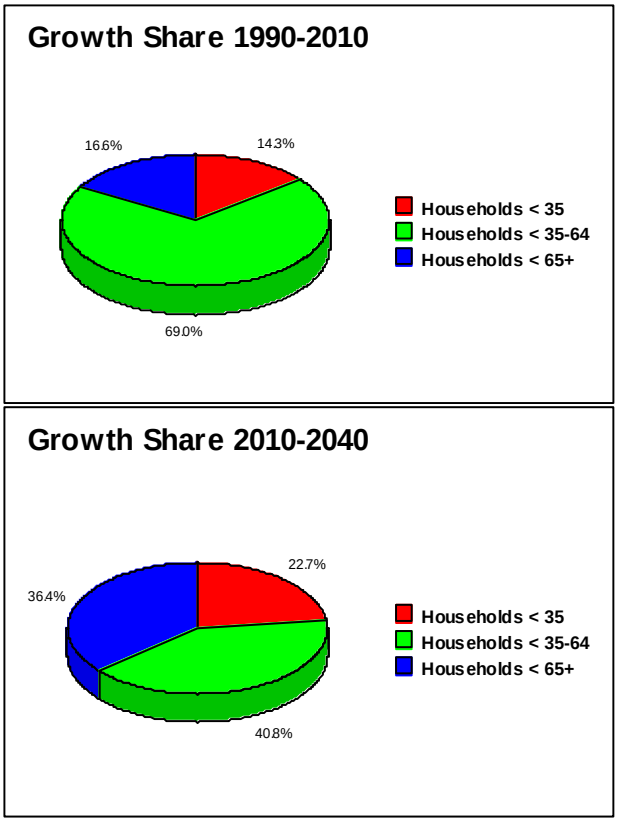

Figure B
Greater Nashville growth share by householder age 1990-2010 and projected for 2010-2040

Source: Arthur C. Nelson.

Demographic changes affect the kinds of homes, communities, and amenities the market wants. Analysis of the consumer preference surveys show that:

- About half of the residents living in Georgia, Kentucky, North Carolina, South Carolina and Tennessee would prefer to live in a mixed-use community where there are a variety of housing choices, walkable destinations, and other features. Perhaps less than one in five have this option now.[1]

- More than 40% of these respondents would choose to own or rent an apartment or townhouse if it has an easy walk to shops and restaurants and have a shorter commute to work. In choosing among detached home options about 60% would prefer larger lots over smaller ones. Given these parameters, respondents would seem to want the following options:

  42% attached homes (townhouses, condominiums, cooperatives and apartments)
  23% smaller detached homes on smaller lots with a shorter commute
  35% larger detached homes in larger lots with a longer commute

In other words, in trading off commuting, walking, mixed-use neighborhoods, and so forth, about two thirds of the residents in these states would choose the attached or small lot option over the large lot one. There are many ways in which to accommodate emerging market demands. One is to facilitate the development of new mixed-use communities with walk/bike opportunities in urban infill/redevelopment sites. Another is to take advantage of redevelopment that will occur along commercial corridors and nodes, especially in suburban areas. Much of the demand can be met by converting transit-ready corridors from very low intensity land uses to ones that provide mixed-use options, especially when transit becomes available. The challenge is creating public-private-civil collaborations that can facilitate both approaches to meeting future housing needs. In doing so, potentially all new nonresidential development and all new attached residential development could occur on existing parking lots along commercial corridors and nodes.

[1] While I would prefer to use respondents from just Tennessee, the number of cases available for just Tennessee is too small to reliably represent the state. I assume the central tendencies in attitudes among these states is similar as a group to Tennessee.

INTRODUCTION

Greater Nashville is comprised of ten counties in Tennessee: the central county of Davidson and the suburban counties of Cheatham, Dickson, Maury, Montgomery, Robertson, Rutherford, Sumner, Wilson, and Williamson. Between 2010 and 2040, Greater Nashville will grow from 1.8 million to 3.1 million residents, which is nearly an 80% increase in population. To aid local planning and decision-making processes, this report reviews market trends, emerging housing preferences, and opportunities facing the region to 2025 and 2040. The report is composed of four parts.

> **Part 1** explores emerging market trends that will influence market choices over the next several decades. One key trend is that fundamental changes will reduce the home ownership rate. Another is that demographic changes will reshape the demand for types of homes and their locations.
>
> **Part 2** synthesizes surveys to determine what Americans generally prefer, with implications for Greater Nashville.
>
> **Part 3** identifies the kinds of jobs that occupy space, estimates the total number of workers who will occupy built space, and estimates the space used by workers in 2010, 2025 and 2040. The analysis includes estimating the volume of workspace existing in 2010 that will be replaced, repurposed, or "recycled" to 2025 and then to 2040.
>
> **Part 4** synthesizes research, analysis and findings of the first three parts to show that, at least in theory, all the demand for new attached residential and nonresidential development to 2040 could be accommodated through the redevelopment of nonresidential spaces, especially along transit-ready commercial corridors and nodes. It also assesses redevelopment opportunities for Davidson County based on analysis of assessor data.

Appendix A includes several detailed tables comparing Greater Nashville, Davidson County, and Suburban Nashville along demographic, tenure, and housing dimensions to 2025 and 2040.

Appendix C provides similar comparisons for employment and nonresidential space needs.

The report begins first by reviewing market trends with a focus on key market trends.

PART 1
MARKET TRENDS

The kind of housing and communities Americans will chose to live in will be among the many changes to occur. To about 90% of Americans, the American Dream[2] includes owning their own home.[3] Moreover, given a choice among types of homes, about 80% of Americans would prefer to live in a single family detached home.[4] But when confronted with changes that will sweep across America to 2030, millions of Americans may choose differently. As shown in Part 2, more than half of Americans also want to live in more mixed-use, mixed-age communities.

This Part has two themes. First, fundamental changes will occur in the economy that may reduce the home ownership rate. Second, demographic changes will reshape the demand for types of homes and their locations. In both cases, we will review broad national trends and, where data allow, trends facing Greater Nashville. I will compare national, state, Greater Nashville, Davidson County, and Suburban Nashville trends to 2025 and then to 2040. I will also note some implications for planning and development.

Table 1.1 reports population and household projections. Two things are evident. First, while Tennessee will grow a little faster than the national average, Greater Nashville will grow at about twice the rate as the state. Second, nearly all the growth will occur in the nine counties comprising Suburban Nashville. Overarching these trends are broader national ones, which I review next.

Trends that will Reshape America's Change in Owner-Renter Patterns to 2040

While home ownership may be a key feature of the American Dream, it will probably become less attainable and perhaps even less desirable by 2040 than it has been in the past. There are six reasons for this: rising energy costs, falling incomes, lagging employment, shifting wealth, tighter home finance, and sweeping demographic changes. The overall effect may be lower homeownership rates in the future than in the past.

[2] At its core, the "American Dream" is one in which "life should be better and richer and fuller for everyone, with opportunity for each according to ability or achievement" (Adams 1931: 214-15). Though never stated in early literature on what constitutes the American Dream, a key feature is the ability of a person to own their home usually on a detached lot (Rohe and Watson 2007).

[3] See http://www.cbsnews.com/8301-503544_162-20075544-503544.html?tag=contentMain;contentBody.

[4] National Association of Realtors, Community Preference Survey 2011, http://www.realtor.org/wps/wcm/connect/a0806b00465fb7babfd0bfce195c5fb4/smart_growth_comm_survey_results_2011.pdf?MOD=AJPERES.

Table 1.1
Greater Nashville Population and Household Projections 2010 to 2025 and 2040
[Figures in thousands]

Metric	United States	Tennessee	Greater Nashville	Davidson County	Suburban Nashville
Population					
Population 2010	309,350	6,357	1,761	570	1,191
Population 2025	357,548	7,625	2,427	628	1,799
Change, 2010-2025	48,198	1,268	666	58	608
Percent Change, 2010-25	**16%**	**20%**	**38%**	**10%**	**51%**
Growth Share, 2010-2025				9%	91%
Population 2040	406,417	8,910	3,097	813	2,283
Change, 2010-2040	97,067	2,553	1,335	243	1,092
Percent Change, 2010-2040	**31%**	**40%**	**76%**	**43%**	**92%**
Growth Share, 2010-2040				**18%**	**82%**
Households					
Households 2010	116,945	2,498	680	260	420
Households 2025	137,208	3,051	954	304	650
Change, 2010-2025	20,263	553	274	44	230
Percent Change, 2010-2025	**17%**	**22%**	**40%**	**17%**	**55%**
Growth Share, 2010-2025				**16%**	**84%**
Households 2040	152,171	3,485	1,191	336	855
Household Change, 2010-2040	35,226	987	511	76	435
Percent Change, 2010-2040	**30%**	**40%**	**75%**	**29%**	**104%**
Growth Share, 2010-2040				**15%**	**85%**

Sources: Census, Woods & Poole, Arthur C. Nelson

A. Rising Energy Costs

Since the end of World War II, home ownership in the U.S. has risen steadily, going from 55% in 1950[5] to 69% in 2004.[6] A key reason has been the vast supply of inexpensive land outside of cities available for home building. Another reason is cheap gasoline: the cost of driving to work and other destinations was low. This has changed, as illustrated in Figure 1.1.

[5] Historical Census of Housing Tables Ownership Rates, http://www.census.gov/hhes/www/housing/census/historic/ownrate.html.

[6] Housing Vacancies and Homeownership for 2005, http://www.census.gov/hhes/www/housing/hvs/annual05/ann05t13.html.

Since the early 1970s, energy prices have been rising steadily. Locations far away from work, shopping, and other destinations are more expensive because of rising vehicle fuel costs and the lack of transit options. Especially between 2002 and late 2012 the national average price of a gallon of gasoline rose more than 10% per year, compounded or three to four times faster than inflation.[7] At this rate, gasoline prices may approach $8 per gallon by 2020 and $15 per gallon by 2030.[8] Reducing gasoline costs can be accomplished by purchasing hybrids which tend to be more expensive than standard vehicles, or smaller more fuel efficient vehicles which long-distance commuters may or may embrace.

Steadily increasing gasoline prices may dampen the attractiveness of suburban fringe and exurban areas for home buying. On the other hand, homes closer in are usually more expensive to purchase. The overall effect of rising gasoline prices may be fewer households able to do both: buy homes and pay for gasoline. While housing costs average about 26% of household income, so does transportation cost. The typical Greater Nashville household spends more than half of its income on housing plus transportation.[9]

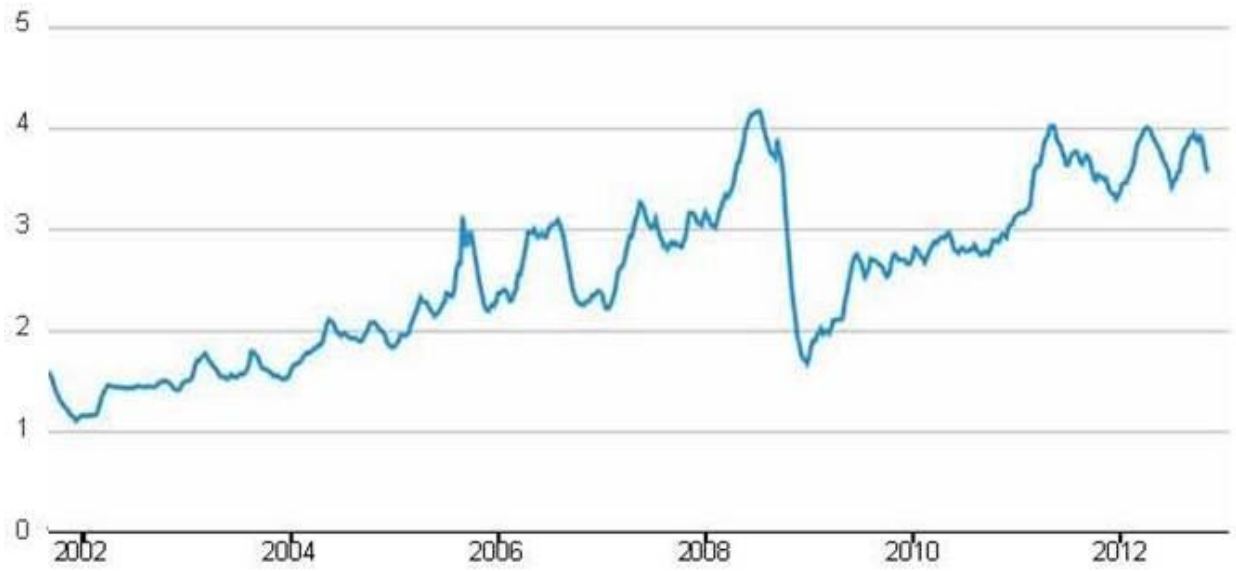

Figure 1.1
Historical gasoline prices in the United States, 2002-2012

Source: Energy Information Administration.[10]
Note: Figures are not adjusted for inflation. Price includes taxes.

[7] The coefficient of determination (R^2) is 0.70; the t-ratio is 35.86; and $p > 0.01$.

[8] See also *Christopher Steiner* 2009 who predicts $20 per gallon gasoline by 2030.

[9] See http://htaindex.cnt.org/about.php.

[10] See Energy Information Administration, Gasoline and Diesel Fuel Update, accessed October 14, 2012 from http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=EMM_EPM0_PTE_NUS_DPG&f=W

B. Falling Incomes[2]

A second factor is at work: incomes are falling in real terms. Median household incomes for all age groups in each income category were lower at the end of 2010 than in 2000 (Harvard Joint Center for Housing 2011: 15). Moreover, the poverty rate increased from 11.3% in 2000 (Dalaker 2001) to 15.1% in 2010 (DeNavas-Walt et al. 2011) and has remained at about that level since. The rate of increase appears to be fastest among the suburbs. Over the period of 2000 to2008, suburbs accounted for nearly half the increase in the population in poverty (Kneebone and Garr 2010). In contrast, primary cities accounted for just over 10% of the increase. By the early 2010s, suburbs had become home to most of the nation's households living in poverty (Kneebone and Berube 2013). Suburbs may be especially hard-hit because of rising gasoline prices (see above) and lagging employment (see below). Combined, those effects may further alter the demand for owner-occupied homes over the next several decades (McKeever 2011). I estimate, for instance, that median household income in 2030 will be about $48,000 compared to about $50,000 in 2009 (using 20089 dollars).

C. Lagging Employment

Not only did the unemployment rate spike during the Great Recession and remain high well into the 2010s, but the current structure of the nation's labor force makes it prone to higher unemployment. A key feature of employment and income is preparedness based on education. Unfortunately, most minority students lag behind White non-Hispanic students in standardized reading and mathematics tests; in fact, since the late 1990s the gap has not been narrowed.[11] As minorities increase their share of the nation's labor force the nation could be challenged with developing enough talent to compete in the global market. A further implication is that the ability of workers to afford homes in the future may be compromised. During the 2010s, the New Majority will comprise 88% of the nation's labor force growth. As the level of preparation of the nation's future labor force declines due to shortcomings in our education system, wages will fall and unemployment rates will rise relative to historical standards. Unless home prices fall and mortgage underwriting becomes more flexible, the overall effect may be lower home ownership rates in 2025 and 2040 than in 2010.

D. Shifting Wealth

There is another trend: the nation's wealth has been shifting steadily to more affluent households. In the 1980s, about 80% of the nation's wealth was held by the wealthiest fifth of America's households. By 2009, nearly 99% of America's wealth was held by the same quintile,[12] as illustrated in Figure 1.2. (The table compares aggregate wealth by income quintile.) The Great Recession and its aftermath can be blamed for reducing much of the wealth of the middle and lower classes. Historically, a large share of American households' wealth has been the equity in their homes. This wealth is threatened, however, as homeowners lost a third of their equity during the recent recession. Indeed, homeowner equity has fallen steadily since 1945, from about 85% to about 40%.[13] This is illustrated in Figure 1.3. New, highly leveraged home purchase opportunities that became widely available during the past generation have helped contribute to the loss of equity. Shifting wealth and loss of home equity have contributed to changing market dynamics:

1. Fewer people are able to buy homes.

[11] See The Nation's Report Card produced by the National Assessment of Educational Progress of the U.S. Department of Education http://nces.ed.gov/nationsreportcard/pdf/main2008/2009479.pdf

[12] See http://www.stateofworkingamerica.org/charts/feature/1.

[13] Ibid.

2. Those who own homes may not be able to refinance to enable a down payment on a new home for their children.

3. Fewer home buyers may further drive down demand, reducing prices, and further eroding equity.

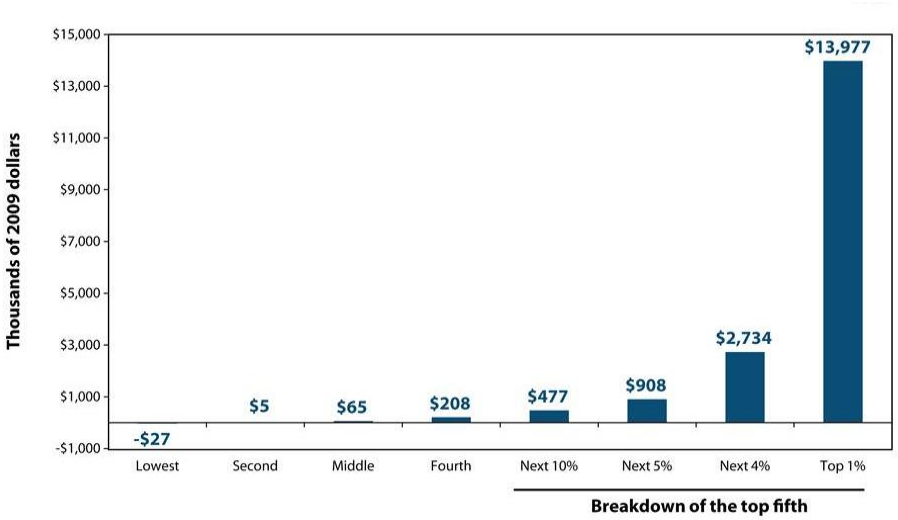

Figure 1.2
Share of wealth held by households, 2009

Source: Economic Policy Institute; Federal Reserve Board, Survey of Consumer Finances and Flow of Fund, http://www.stateofworkingamerica.org/files/images/orig/11Wealth_quintile_and_top_quintile_2.png.
Note: Wealth is determined by net worth, i.e. assets less liabilities. 2009 data are from Survey of Consumer Finances in 2007 with asset prices adjusted to reflect changes from 2007 to 2009 in Flow of Funds data.

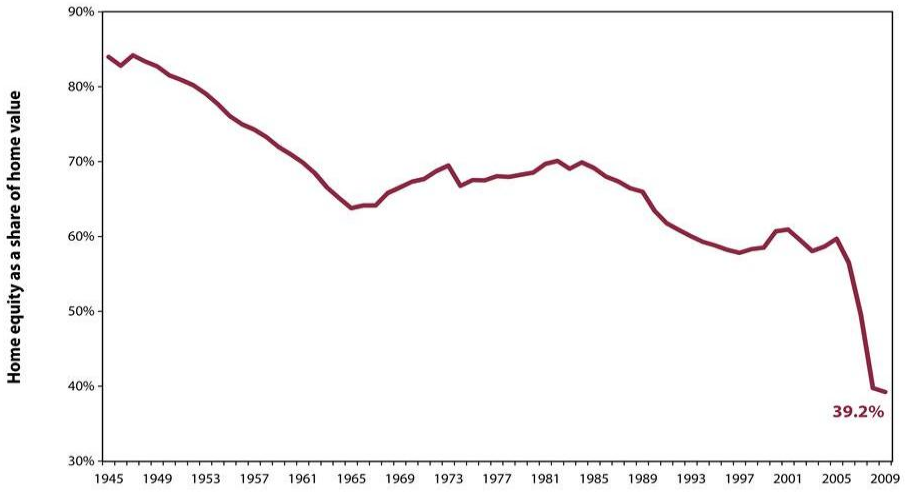

Figure 1.3
Homeowner Equity as Share of Home Value, 1945–2009

Source: Economic Policy Institute analysis of Federal Reserve Board, Flow of Funds data.
http://www.stateofworkingamerica.org/files/images/Figure-O_Homeequirty_inhouse_2.png.

E. Tighter Home Financing

The "Great Recession" of 2008-09 was caused in large part by the bursting of the "housing bubble" of the middle 2000s. Banks and other financial institutions closed, millions of homes were foreclosed (or "sold short" to avoid foreclosure), and home equity saw its biggest decline since the start of the Great Depression. In the wake of this financial disaster, lending institutions increased their underwriting requirements, thereby reducing the number of people who could qualify to buy a home.

Since then, the financial market for mortgage underwriting has changed substantially. Home buyers who would formerly qualify for conventional mortgages now need higher credit scores, longer and more stable work histories, and higher down-payment requirements – reverting to the 20% down payment tradition. The move to make the 20% down-payment standard for conventional mortgages from lending institutions regulated by the federal government[14] draws this concern from the National Association of Home Builders:

> Requiring a high down payment would disproportionately harm first-time home buyers, who have limited wealth and on average account for 40% of home-buying activity. It would take an average family 12 years to scrape together a **20% down payment**. Borrowers who can't afford to put 20% down on a home and who are unable to obtain FHA financing will be expected to pay **a premium of two percentage points** for a loan in the private market **to offset the increased risk to lenders**, according to NAHB economists. This would **disqualify about 5 million potential home buyers**,[15] resulting in 250,000 fewer home sales and 50,000 fewer new homes being built per year.[16] [Emphases added.]

As seen in Figure 1.4, about two-thirds of all American households owning homes with mortgages in 2009 put down less than 20% for their home.[17] Clearly, higher down payment requirements will reduce the number of households that can afford to buy a home.

F. Sweeping Demographic Changes

Sweeping demographic changes may further erode homeownership rates. The largest group of homeowners, the Baby Boomers (born between 1946 and 1964) will turn 65 between 2011 and 2029. As they become empty-nesters, they will begin selling off their homes around the end of the 2010s. Moreover, non-Hispanic Whites will become less dominant in the economic; indeed, nearly all population growth to 2040 will be attributable to racial and ethnic minorities which I call collectively the New Majority. Household composition will also change. The percentage of American households with children will have dropped from half during the Baby Boom years of 1946 to 1964 to a quarter by 2030 and 2040.

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[14] See http://www.slate.com/articles/business/moneybox/2011/02/the_abcs_of_qrm.html.

[15] Considering there were about 75 million home owners in 2010, losing 5 million would reduce the home ownership rate from above 66% to about 60% -- a rate not seen since 1960.

[16] See http://www.nahb.org/news_details.aspx?newsID=12403.

[17] See *American Housing Survey of the United States 2009*, Table 3-14, http://www.census.gov/housing/ahs/data/ahs2009.html.

Percent of purchase price	Share	Cumulative
No down payment	14%	14%
Less than 3 percent	8%	22%
3-5 percent	12%	34%
6-10 percent	16%	50%
11-15 percent	6%	56%
16-20 percent	***13%***	***69%***
21-40 percent	13%	82%
41-99 percent	7%	90%
Bought outright	10%	100%

Figure 1.4
Down payment as share of house purchase

Source: Arthur C. Nelson adapted from U.S. Census Bureau, *American Housing Survey* for 2009 (2010).
Note Highlighted range shows households with about 20% down payment.

Since the end of the Baby Boom era, America has been composed mostly of households without children. In 2000, roughly a third of American households had children and in 2030 slightly more than a quarter will. Because people are living longer than ever before, America will also be composed of a few very large and roughly equally-sized age groups (generations), each with their own unique housing needs:

Eisenhowers– People born before 1946. There will be about 6 million of them living in 2040,[18] down from about 40 million in 2010. They will comprise about 5 million households. People in this generation will be more than 95 years old and live in downsized units, assisted living, nursing homes, with kith or kin, or in other forms of group housing. Eisenhowers will also be predominately women.

Baby Boomers– People born between 1946 and 1964. In 2010 there were about 82 million Boomers and in 2040 they will number about 60 million living in about 30 million households. Beginning about 2016 when the youngest Boomers turn 70, they will be actively engaged in downsizing. The American Association of Retired Persons notes that about 90% of older adults would prefer to "age in place" and about 80% believe they can do so in their current residence (Keenan, 2010). But many millions will be unable to do so and will choose downsize with many moving into assisted living, nursing homes, living with kith or kin, or in other forms of group housing. Yet, many millions who may want to move into homes more suitable to their life stage may not be able to. For them, aging in place will be a necessity for longer than they might have anticipated (see Cisneros, 2011).

Gen X– People born between 1965 and 1980. There will be about 65 million of them in 2040. Their households will number about 30 million. Being in their 60s to middle 70s in 2040, they will be empty-nesting and downsizing.

Gen Y– People born between 1981 and 1995. In 2040, they will number about 73 million and include about 32 million households. Being in their 50s to middle 60s in 2040, they will be at the

[18] See http://www.census.gov/prod/2010pubs/p25-1138.pdf.

peak of their earning power and likely choosing to live in the most expensive housing of all age groups, whether 'McMansions' in the suburbs or condominiums in downtowns and all the major forms of owner-occupied housing in between.

Millennials– People born between 1996 and 2010. In 2040, they will number about 75 million living in about 35 million households. Being in the middle 30s to middle 50s, they will also be at the peak of child-rearing age and will also be the group most demanding of larger homes with good public school systems.

These generational changes will usher-in other household dynamics. For instance, consider average household size and its effect on overall housing demand. For more than a century, the average household size in the United States has been falling, as shown in Figure 1.5. Starting at 4.60 persons per household in 1900, average household size fell steadily to 2.59 persons per household in 2000.[19] There are many reasons for declining household size: (a) women are delaying or forgoing marriage and are thus increasingly older when they have children, and they have fewer children; (b) more women are raising children outside of marriage; (c) extended families are weakened and possibly not needed as the population moves from rural to urban environments ; (d) the education of women leads to more women in the workforce, delaying marriage and reducing the birth rate; and (e) improved birth control since the 1960s (Downs 2003 and Goldin 2005). Rising divorce rates also contribute to smaller household sizes.

Declining household size means more homes are needed for the same population. For instance, the same one million people in 1900 occupied about 217,000 homes but in 2000 they would need about 386,000 homes. Between 1950 and 2000, the combination of population growth with declining household size made for a robust home-building industry. During this period, the population grew by 87% while the number of occupied housing units increased by 144%. Put differently, for every two new residents in the U.S. one new home needed to be built.

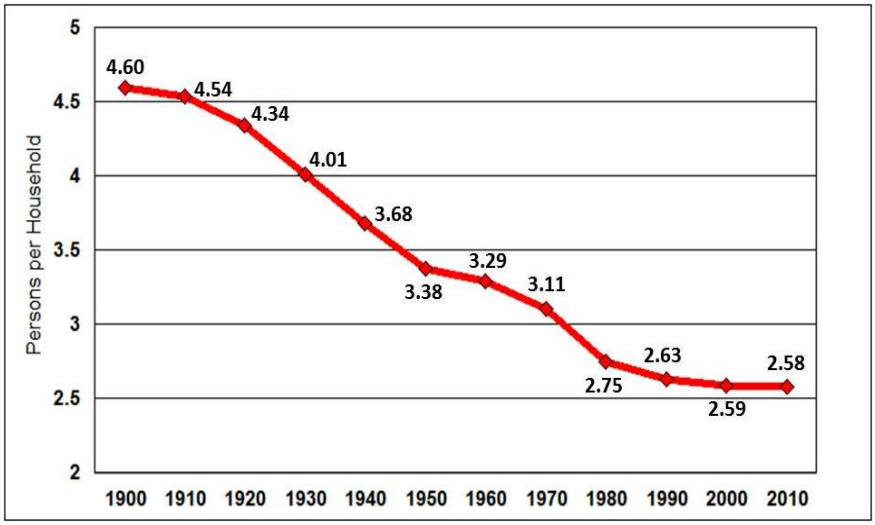

Figure 1.5
Household size trend, 1990-2010

Source: Census.

[19] See http://www.census.gov/statab/hist/HS-12.pdf, "Households by Type and Size: 1900 to 2002".

That has changed. Instead of falling to 2.53 persons per household in 2010 as many demographers projected (see Day 1996, e.g.), average household size was actually 2.58,[20] nearly the same as in 2000. As shown in Figure 1.5, the trend toward ever-declining household size seems to have stopped and might even be reversed in future years. In effect, during the 2000s, an excess of homes were built because about 16.4 million residential units were permitted.[21] Even if average household size had declined from 2.59 persons to 2.53 as predicted, and given the nation's household population grew from about 278 million to about 303 million, fewer than 13 million new housing units would have been needed. As it is, given the decreased per-capita housing demand resulting from larger than expected household size, about four million more homes were built than were needed.

While the "Great Recession" of the later 2000s with its lingering effects into the middle 2010s could be blamed for stabilizing household size, in fact, other dynamics are at work. Principal reasons for increasing number of persons per household include rising fertility rates and households doubling up into larger units.

First, consider fertility rates. Demographers consider that a fertility rate of 2.1 sustains a population; a higher rate means the population is growing while a lower one means it is falling. Indeed, the nation's fertility hit an all-time low of 1.7 in 1976 but it has risen steadily since. By the late 2000s, the fertility rate had risen to 2.1.

The changing ethnic composition of America is increasing the nation's fertility rate, a trend that is especially influenced by the Hispanic population. In 2000, Hispanics accounted for about 12.5 percent of the U.S. population but their share rose to about 16 percent in 2010. Hispanics accounted for half of the nation's growth during the decade. One reason is the higher fertility rate among Hispanic women relative to women of other selected ethnicities[3] (Martin et al. 2009).

Overall, more women are having children at later ages than earlier generations (Hamilton et al. 2009). In 1976, nearly all babies were born to women under 30. Controlling for age, the fertility rate of women under 30 years of age was a little less than 1.5, while for women over 30 it was about 0.3. By the end of the 2000s, the fertility rate of women less than 30 years of age had not changed since 1976, but for women over 30 is had increased to nearly 0.7. In other words, the entire increase of the fertility rate between 1976 and the end of the 2000s was attributable to women over 30 years of age, though the overall rate has fallen nonetheless.

Another important trend is the rise of multi-generational households [4](Taylor et al. 2010). These households take several forms: (a) two generations with parents (or in-laws) and adult children ages 25 and older; (b) three generations with parents (or in-laws), adult children (and spouse or children-in-law), and grandchildren; (c) "skipped" generation with grandparents and grandchildren, without parents (including step-generation); and (d) more than three generations (Taylor et al. 2010: 2). Since 1980, the number and share of Americans living in multi-generational households rose to 49 million and 16% in 2008, respectively. Moreover, the trend since 1980 has affected adults of all ages, especially the elderly and the young regardless of the recessions of the early 1980s, 1990s, and the Great Recession of the late

[20] U.S. Census Bureau, Current Population Survey, 2010 Annual Social and Economic Supplement, Table AVG1 Average Number of People per Household, by Race and Hispanic Origin/1, Marital Status, Age, and Education of Householder: 2010, http://www.census.gov/population/www/socdemo/hh-fam/cps2010.html.

[21] See http://www.census.gov/const/www/C40/table1.html, New Privately Owned Housing Units Authorized by Building Permits in Permit-Issuing Places.

2000s; and regardless of the booms of the late 1980s and from the middle 1990s to the late 2000s. in other words, the rise in multi-generation households does not seem to vary by good economic times or bad. This is illustrated in Figure 1.6.

Taylor et al (2010) note that as Boomers enter retirement age in unprecedented numbers and our racial and ethnic minority populations contribute an increasing share of population growth, the number and share of multi-generational households seem destined to increase. But by how much has not been reported. Extrapolation of trends over the period 1980 to 2008 indicates that about 20% of Americans may be in multi-generational households by 2040. We have not made such an estimate for Greater Nashville, however. The real number might be closer to what was seen in 1900, about 24%.

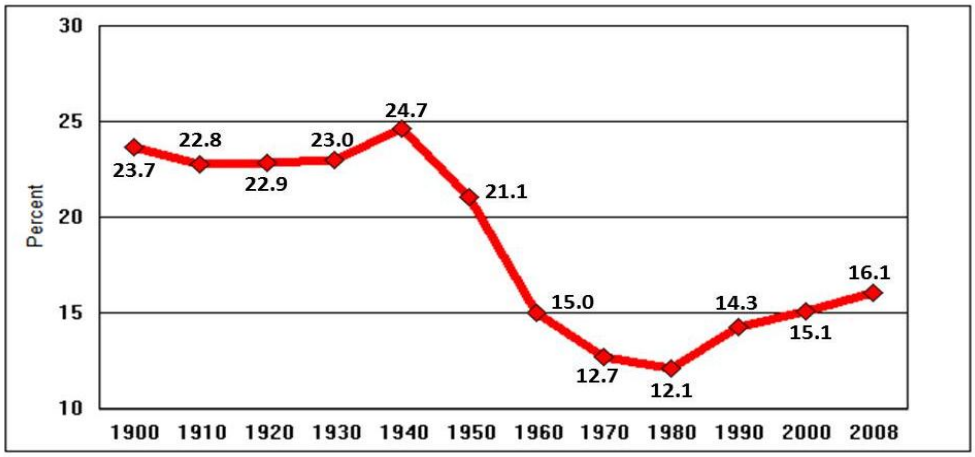

Figure 1.6
Percent multi-generational households, 1900-2008

Source: Pew Research Center (2010)

These trends in fertility and multigenerational households lead to the most sweeping change of all. For its entire existence, the United States was a nation mostly of households with children. By 2040, slightly more than a quarter of American households will have children. Even more remarkable is this: between 2010 and 2040, households with children will account for only 19% of the total new housing demand, while households without children will comprise 81% of the new housing demand. Indeed, single person households will demand more than twice the number of new housing units as households with children: 44% compared to 19%, as will be shown later.

Other demographic trends are emerging. Foremost is the racial/ethnic composition of the nation and Greater Nashville. The Census projects that by the early 2040s, most Americans will be members of minority racial and ethnic groups. In my view, they will become America's "New Majority". Key findings based on Table 1.2 include:

- Nationally, New Majority population growth will be nearly triple that of White (non-Hispanic) population growth to 2040.

- The New Majority will comprise most of the population growth in Greater Nashville to both 2025 and 2040 including all the growth in Davidson County and more than 40% of the growth in Suburban Nashville.

These changes, combined with others, will have profound effects on America's future housing markets. Just how profound is open to speculation. Between 2010 and 2040, White Non-Hispanics will account for only 9% of the nation's growth. They will account for 46% of the growth in Tennessee, however, as well as 44% of the growth in Greater Nashville. On the other hand, Davidson County will see an overall reduction in White Non-Hispanics as the New Majority will account for all the growth there. In contrast, White Non-Hispanics will account for 64% of Suburban Nashville's growth.

Table 1.2
Racial/Ethnic Population 2010 to 2025 and to 2040
[Figures in thousands]

Metric	United States	Tennessee	Greater Nashville	Davidson County	Suburban Nashville
White Non-Hispanic					
Population Change, 2010-2025	48,198	1,268	666	58	608
White NH Population 2010	201,912	4,886	1,306	369	937
White NH Population 2025	209,633	5,559	1,657	326	1,332
White NH Change, 2010-2025	7,721	673	351	(43)	394
White NH Change Share 2010-25	**16%**	**53%**	**53%**	**-74%**	**65%**
Population Change, 2010-2040	97,067	2,553	1,335	243	1,092
White NH Population 2040	210,932	6,061	1,896	261	1,635
White NH Change, 2010-2040	9,020	1,176	590	(108)	698
White NH Change Share 2010-40	**9%**	**46%**	**44%**	**-44%**	**64%**
New Majority					
New Majority Population, 2010	107,438	1,471	456	260	196
New Majority Population, 2025	147,915	2,066	770	394	376
New Majority Change, 2010-2025	40,477	595	314	135	180
New Maj. Change Share 2010-25	**84%**	**47%**	**47%**	**234%**	**30%**
New Majority Population, 2040	195,485	2,849	1,201	552	648
New Majority Change, 2010-2040	88,046	1,378	745	293	452
New Maj. Change Share 2010-40	**91%**	**54%**	**56%**	**121%**	**41%**

Source: Arthur C. Nelson adapted from Woods & Poole.

Another key change is the aging of America's population, headlined by Baby Boomers (born between 1946 and 1964) who will turn 65 between 2011 and 2029. For the U.S. as a whole, those over 65 will account for half of the net change in population to 2025 and 42% to 2040. For Greater Nashville this is 24% and 21% respectively, considerably less than the U.S. The reason is that Greater Nashville is attracting younger people including younger Tennesseans who migrate from elsewhere within the state to

the area. What is also interesting is that the share of growth among seniors in Davidson County will be only 9% between 2010 and 2040. Combined with the New Majority comprising all the growth there, it would seem that Davidson County will see an influx of younger New Majority residents to 2040. This is shown in Table 1.3.

Table 1.3

Share of Net Population Change 2010 to 2025 and 2040 Attributable to Persons 65+
[Figures in thousands]

Metric	United States	Tennessee	Greater Nashville	Davidson County	Suburban Nashville
Population 65+ 2010-2025					
Population 65+ 2010	40,331	855	182	66	117
Population 65+ 2025	64,181	1,359	342	86	256
Population 65+ Change 2010-2025	23,850	505	160	21	139
Percent Change 2010-2025	**59%**	**59%**	**88%**	**31%**	**119%**
Growth Share 2010-2025	**49%**	**40%**	**24%**	**36%**	**23%**
Population 65+ 2010-2040					
Population 65+ 2040	81,250	2,453	463	86	376
Population 65+ Change 2010-2040	40,919	1,598	280	21	260
Percent Change 2010-2040	**101%**	**187%**	**154%**	**32%**	**222%**
Growth Share 2010-2040	**42%**	**63%**	**21%**	**9%**	**24%**

Source: Arthur C. Nelson adapted from Woods & Poole.

There are other trends afoot that will influence what it is Americans want for their housing and communities. Considering the kinds of households that will be formed over the next few decades, I find that future housing demand will be nothing like the past, and I divide households into three broad groups:

> **Starter-home** households with householders under 35; they are young people many with young families, starting out in their career, and tend to rent or buy smaller homes, townhomes, or condominiums.
>
> **Peak housing demand** households with householders 35 to 64; they are in the peak of their space demand and often at the peak of their income with more than half comprised of dual-income households.
>
> **Empty-nesting/downsizing** households with householders 65+; for the most part they have raised their families, are retiring, and no longer wish to care for larger homes especially on large lots far away from services, shopping, and medical assistance.

Table 1.4 shows the number of households by age category for 1990, 2020, 2025 and 2040, and change between 1990-2010, 2010-2025, and 2010-2040. For the nation, peak housing demand households

accounted for 78% of all the growth in households between 1990 and 2010 followed by empty-nesting/downsizing households at 22%. Furthermore, there were actually fewer started households in 2010 than in 1990. Trends were similar for Tennessee. Greater Nashville saw an increase in starter households, reflecting its attractiveness to younger people. Otherwise, trends were consistent with the nation and the state. Trends will be very different to 2025 and 2040.

Table 1.4

Households by Age Group, 1990-2010, 2010-2025, and 2010-2040
[Figures in thousands]

Metric	United States	Tennessee	Greater Nashville	Davidson County	Suburban Nashville
Change in Household Growth by Age, 1990-2010					
Household Change	24,951	635	247	51	195
Change in Households <35	(1,285)	12	35	8	27
Change in Households 35-64	20,457	478	172	39	133
Change in Households 65+	5,779	154	41	5	36
Households <35 Growth Share	**0%**	**2%**	**14%**	**16%**	**14%**
Households 35-64 Growth Share	**78%**	**74%**	**69%**	**74%**	**68%**
Households 65+ Growth Share	**22%**	**24%**	**17%**	**10%**	**18%**
Change in Household Growth by Age, 2010-2025					
Household Change	10,297	553	274	44	230
Change in Households	1,451	79	50	6	45
Change in Households	2,803	122	85	19	67
Change in Households 65+	6,026	352	139	33	106
Households <35 Growth Share	**14%**	**14%**	**18%**	**13%**	**19%**
Households 35-64 Growth Share	**27%**	**22%**	**31%**	**42%**	**29%**
Households 65+ Growth Share	**59%**	**64%**	**51%**	**45%**	**52%**
Change in Household Growth by Age, 2010-2040					
Household Change	35,226	987	511	76	435
Change in Households <35	5,885	198	116	21	96
Change in Households 35-64	10,041	298	209	26	182
Change in Households 65+	19,300	491	186	29	157
Households <35 Growth Share	**17%**	**20%**	**23%**	**27%**	**22%**
Households 35-64 Growth Share	**29%**	**30%**	**41%**	**35%**	**42%**
Households 65+ Growth Share	**55%**	**50%**	**36%**	**38%**	**36%**

Source: Arthur C. Nelson.

Nationally, between 2010 and 2025, peak housing demand households will account for only 27% of the growth with starter households increasing to 14% share while empty-nesting/downsizing households will dominate the market at 59% share; for Tennessee the figures are similar at 22%, 14% and 64% respectively. In contrast, Greater Nashville will see considerably higher shares of starter households and peak demand households than the nation and the state.

Going out to 2040, national and state trends will be similar. Greater Nashville, however, will continue to see higher shares of starter and peak demand households, and lower shares of downsizing households. Still, compared to the period 1990 to 2010 where the vast majority of new housing demand was created by households during their peak housing demand part of their life cycle – around 70%, those households will be less than 40% of the market share between 2010 and 2040.

Change over the period 2010 to 2040 will be unprecedented in another respect: households without children and especially single person households will dominate future housing markets. During the 1950s and 1960s, about half of American households had children in them. In 2000, the share fell to a third and in 2010 it fell further to about 30%. By 2040, about 27% of American households will have children in them while 73% will not. Among households without children, in 2040 more than 40% will be single. The reason is mainly boomers losing their partners. Indeed, single-person households in 2040 will outnumber households with children.

The falling share of households with children and rising share of single-person households will have profound effects on the housing market. Between 2010 and 2040, households with children will account for only 19% of the total change in the number of households; households without children will account for the remaining 81% while single-person households will account for 44% of the total, and 54% of households without children. In fact, the growth of single-person households will be 2.3 times higher than households without children. Whereas the housing market of the 1950s and 1960s was dominated by parents raising baby boom children, and during the 1980s through the 2000s boomers raised their own children, the future housing market is decidedly dominated by households without children and especially single-person households.

These national trends and those for Tennessee and the Greater Nashville are shown in Table 1.5. While the state follows national trends Greater Nashville is less pronounced. Between 2010 and 2040, households with children will account for 28% of the share of household change in Greater Nashville, 19% (the national average) in Davidson County, and 30% in Suburban Nashville. Households without children will account for 82%, 91% and 70% of the change in share, respectively. Single-person households will account for a larger change in share than change in households with children at 34%, 49% and 32% respectively.

Demographic trends seem poised to push homeownership rates down, but by how far and by when is subject to speculation. More than demographics affect home ownership rates, however. The rate of homeownership is largely a function of household income and the ability to make a down payment. Homeownership was pushed to its limits in the mid-2000s at the 2004 all-time high of about 69%. Contributors included "subprime" loans with limited, non-traditional paperwork and easy qualifying, "Alternative-A" loans for people meeting marginal qualification standards, and "jumbo" loans for borrowing more than the Federal Housing Administration limits. Those modes of financing are either gone or highly restricted. Conventional home financing, reminiscent of the period from the 1960s into the middle 1990s, is now about the only way to buy a home, and this will likely be the case in the coming decades. The effect may be to push down homeownership rates and increase demand for rental housing. Demographic changes will likely add to lessening homeownership rates.

How far will the homeownership rate fall? Between 1965 and 1995, the median homeownership rate was about 64%. This figure reflected housing demand from a society composed mostly of White non-Hispanic households. Between 2000 and 2010, easy credit masked the effects of a shift in demographics and the homeownership rate did not change much. Homeownership rates did not change being roughly 65% among all households and about 72% among White Non-Hispanic households. Among the largest minority groups, the Black homeownership rate dropped from 47% to 45% while the Hispanic homeownership rate rose slightly from 46% to 47%.[22] When considering tighter underwriting requirements combined with demographic changes, the Urban Land Institute (McIlwain 2009) projects that the home ownership rate in 2020 would range between about 62 percent and 64 percent, illustrated in Figure 1.7.

[22] From Housing and Household Economic Statistics Division, Census Bureau. http://www.census.gov/hhes/www/housing/hvs/qtr111/files/q111press.pdf.

Table 1.5
Change in Households by Type, 2010 to2025 and to 2040
[Figures in thousands]

Metric	United States	Tennessee	Greater Nashville	Davidson County	Suburban Nashville
Baseline 2010					
Households with Children 2010	34,814	710	212	65	147
Households without Children 2010	82,131	1,787	468	195	273
Single-Person Households 2010	31,264	672	179	90	89
Change in Household Growth by Type, 2010-2025					
Households with Children 2025	38,358	791	279	69	210
HHs with Children Growth	3,544	81	67	4	63
HHs with Children Growth Share	**13%**	**15%**	**24%**	**8%**	**28%**
Households without Children 2025	104,874	2,260	675	236	440
HHs without Children Growth	22,743	472	207	40	167
HHs without Children Growth Share	**87%**	**85%**	**76%**	**92%**	**72%**
Single-Person Households 2025	45,299	944	278	109	169
Single-Person HHs Growth	14,035	271	99	19	79
Single-Person HHs Growth Share	**53%**	**49%**	**36%**	**44%**	**34%**
Change in Household Growth by Type, 2010-2040					
Households with Children 2040	41,486	913	357	80	277
HHs with Children Growth	6,672	202	145	15	130
HHs with Children Growth Share	**19%**	**20%**	**28%**	**19%**	**30%**
Households without Children 2040	110,685	2,572	834	256	578
HHs without Children Growth	28,554	785	366	61	305
HHs without Children Growth Share	**81%**	**80%**	**72%**	**81%**	**70%**
Single-Person Households 2040	46,902	1,107	353	127	227
Single-Person HHs Growth	15,638	435	174	37	137
Single-Person HHs Growth Share	**44%**	**44%**	**34%**	**49%**	**32%**

Source: Arthur C. Nelson.

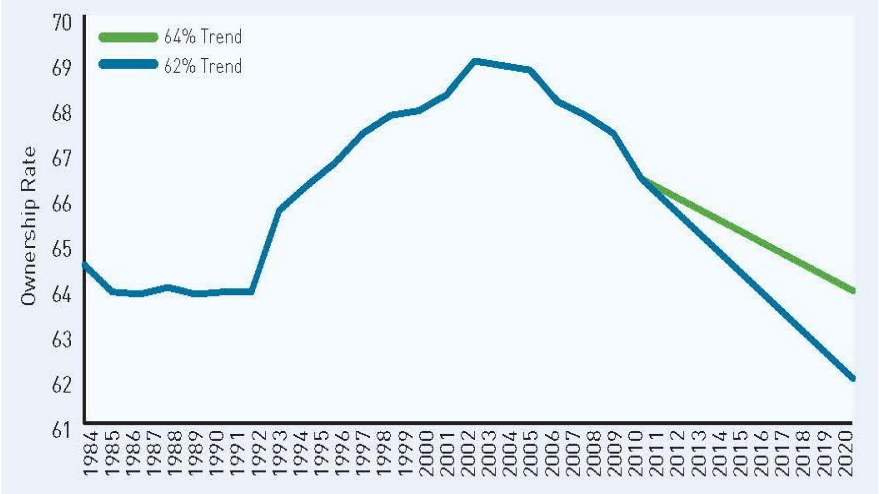

Figure 1.7
Actual and projected home ownership rates, 1984-2020[5]

Source John McIllwain (2009).

I estimate that because homeownership rates are lower for minorities, the increasing share of minorities projected to 2040 will cause the nation's ownership level to fall from 65% in 2010 to about 62% and perhaps lower. If home ownership falls to about 62%, then the demand for rental housing will increase at a faster pace than population growth. Rental housing will account for about half of the growth. Holding 2010 homeownership rates constant to 2040 may be optimistic, however, given the trends reviewed earlier. If the homeownership rate for each racial and ethnic group is just five percent lower in 2040 than in 2010 – moving from 72% to about 68% for non-Hispanic Whites for instance – the nation's overall homeownership rate will fall to about 60% – the same it was in the 1960s. Rental housing would account for two thirds or more of the new housing demand with owner housing accounting for less than a quarter.

Ownership trends to 2025 and 2040 are reported in Table 1.6 for the nation, Tennessee, and Greater Nashville. The method for estimating tenure change is as follows. The ownership rate for each major racial and ethnic group in 2010 is assumed to be the same for 2025 and 2040. Indeed, the 2010 rates for these groups (White Non-Hispanic, Hispanic, Asian, Black and all other) was about the average of the annual rates over the period 1994 through 2011. Those rates are applied to my estimate households based on householder race/ethnicity to 2025 and 2040.

Table 1.6
Tenure Change 2010 to 2025 and 2040
[Figures in thousands]

Metric	United States	Tennessee	Greater Nashville	Davidson County	Suburban Nashville
Baseline 2010					
Home Owners 2010	76,133	1,704	450	145	305
Renters, 2010	40,812	794	229	115	115
Ownership Rate, 2010	**65.1%**	**68.2%**	**66.2%**	**55.9%**	**72.6%**
Renter Rate, 2010	**34.9%**	**31.8%**	**33.8%**	**44.1%**	**27.4%**
Tenure Analysis 2010-2025					
Homeowners, 2025	89,691	2,031	623	158	465
Renters, 2025	53,540	1,020	331	146	185
Ownership Rate, 2025	**63.1%**	**66.6%**	**65.3%**	**52.0%**	**71.5%**
Renter Rate, 2025	**36.9%**	**33.4%**	**34.7%**	**48.0%**	**28.5%**
Change in Homeowners	14	328	173	13	160
Change in Renters	13	225	102	31	70
Total Change in Households	26	553	274	44	230
Owner Share of Change	**52%**	**59%**	**63%**	**29%**	**69%**
Renter Share of Change	**48%**	**41%**	**37%**	**71%**	**31%**
Tenure Analysis 2010-2040					
Homeowners, 2040	94,013	2,294	769	164	604
Renters, 2040	58,158	1,191	422	172	250
Ownership Rate, 2040	**61.6%**	**65.8%**	**64.5%**	**48.9%**	**70.7%**
Renter Rate, 2040	**38.4%**	**34.2%**	**35.5%**	**51.1%**	**29.3%**
Change in Homeowners	18	590	318	19	300
Change in Renters	17	397	193	57	136
Total Change in Households	35	987	511	76	435
Owner Share of Change	**51%**	**60%**	**62%**	**25%**	**69%**
Renter Share of Change	**49%**	**40%**	**38%**	**75%**	**31%**

Source: Arthur C. Nelson.

Based on the constant race/ethnicity tenure assumption, the national home ownership rate is projected to fall from 65.1% in 2010 to 63.1% in 2025 and then to 61.6% in 2040. For Tennessee the figures are 68.2%, 66.6% and 65.83%, respectively, while for Greater Nashville those figures are 66.2%, 65.3% and 64.5%, respectively. Figures for Davidson County are considerably less, however, at 55.9%, 52.0% and

48.9%, respectively. In contrast, figures for Suburban Nashville are 72.6%, 71.5% and 70.7%, respectively. Though these reductions in ownership rate seem small, they lead to important shifts in the demand for owner and rental housing:

- For the U.S., the changing tenure rates mean that between 2010 and 2025, 48% of the net new demand for housing will be for rentals and to 2040 it will be 49%.
- For Tennessee, these figures are 41% and 40%, respectively.
- In Greater Nashville, rental demand will account for 37% of the change to 2025 and 38% to 2040 while for Davidson County these figures are 75% and 71%, while for Suburban Nashville they are 31% for both periods.

There is another factor that can lead to higher renter rates in the future than the past. As people age they tend to shift from owner to renters, with most moving into apartments as opposed to independent or assisted living units. Using data from the American Housing Survey, Table 1.6 shows the propensity of people over 70, in five-year age groups, to sell and then to rent. These are national figures. About 82% of households where the householder is over 65 own their homes, the highest of any age cohort. (For the next several years they will also be the most White, non-Hispanic age cohort, but as the new majority grows the homeownership rate among seniors may fall.) About 4% of 65+ households sell their homes any given year. Table 1.6 shows that for all households over 70, more than half of sellers become renters. The renter rate increases with age. Mathematically, about 80% of all 65+ homeowners will sell their homes and become renters before moving into nursing care or passing on. Rental options include independent living, assisted living, and age-restricted apartments, which are especially attractive to seniors as they can "lock and leave" for extended periods (such as visiting grandchildren, taking extended vacations). Age-restricted apartments targeted to seniors also receive preferential legal status in local land-use decisions because seniors are a "protected class" under the Federal Civil Rights Act.

Table 1.6
Propensity of Senior Owners by 5-Year Age Group to Move and Rent

Householder Age	Owners Who Move Annually	Owner to Renter Percent
All Householders 70+	4.0%	52%
All Householders 75+	3.9%	60%
All Householders 80+	4.1%	68%
All Householders 85+	4.5%	79%

Source: Adapted from American Housing Survey raw data.

G. Challenges Ahead

America became a "suburban nation" between 1950 and 2000. The share of Americans living in suburban areas increased from 27% in 1950 to 52%. Suburbia grew by 100 million people, accounting for three-quarters of the nation's population change.

That was then; this is now. In 1950 more than half of America's households had children living with them while single-person households accounted for slightly more than 10% of all households, and the average

household size was 3.4 persons. By 2040 only slightly more than quarter of all households will have children living in them, more than a third of all households will be single-person, and the average household size will be unchanged from 2000 or 2010, at about 2.6 persons. The needs of a society dominated by childless households, a growing share of which have only one person, will be different from needs seen in the middle of the 20th century when households with children were in the majority.

There was also a time when owning a home was seen as nearly a risk-free way to accumulate wealth and eventually enjoy a modest retirement. This has changed. Between the middle 2000s and middle 2010s, American real estate lost more than $6 trillion in value, or almost 30%. Up to one in five American homeowners found themselves owing more on a mortgage than what their home was worth.[23] Analysis of home values reported by the National Association of Home Builders shows that between 2000 and 2011 the average value of all homes in the U.S. fell in real terms.[24] While home ownership remains an important element of the nation's economy, there is also an emerging sense among prospective homebuyers to be cautious. For instance, the National Foundation for Credit Counseling summarized results of a 2009 survey it commissioned as follows (Cunningham 2009):

> *The lack of confidence in consumers' ability to buy a home, improve their current housing situation, or trust homeownership to provide a significant portion of their wealth sends a strong message about the impact of the housing crisis. It appears that whether a person was directly affected or not, Americans' attitudes toward homeownership have shifted.* (p 1)

The survey also found that:

1. Almost one-third of those surveyed, or roughly 72 million people, do not think they will ever be able to afford to buy a home;

2. Forty-two percent of those who once purchased a home, but no longer own it, do not think they will ever be able to afford to buy another one;

3. Of those who still own a home, 31% do not think they'll ever be able to buy another home (upgrade existing home, buy a vacation home, etc.); and

4. Seventy-four percent of those who have never purchased a home felt that they could benefit from first-time homebuyer education from a professional.

Demographic, economic, finance, and preference changes will affect America's future housing market dramatically; just how dramatically is open to speculation.

Summary

Over the next several decades, Greater Nashville will grow rapidly at more than twice the national average. As it grows it will do so in ways very different from the recent past:

[23] See Michael F. Ford, director of the Xavier University's Center for the Study of the American Dream, Washington Post op-ed, http://www.washingtonpost.com/opinions/five-myths-about-the-american-dream/2011/11/10/gIQAP4t0eP_story.html.

[24] See The NAHB/Wells Fargo Housing Opportunity Index: Complete History by Metropolitan Area, http://www.nahb.org/reference_list.aspx?sectionID=135, and compare national average sales prices in 2000 to 2011 prices using the consumer price index calculator., http://data.bls.gov/cgi-bin/cpicalc.pl?cost1=1&year1=2000&year2=2011.

- Between 1990 and 2010, households in their peak housing demand period of their lifecycle accounted for 69% of the new housing needs, yet

- Between 2010 and 2040 they will account for a third less, about 41% of new housing needs

This dramatic shift in demand is associated with Baby Boomers who came into their own between the middle 1980s through the 2000s in needing and being able to buy larger homes mostly in suburban locations. As they age, they will become empty-nesters prone to downsizing, and their household size will also fall as they lose partners. Those same Boomers, who averaged more than three persons per household when raising families in the 1990s, will dominate the market for smaller homes or attached homes and more rental options largely because their household size will fall below two persons per residential unit. Indeed, between 2010 and 2025, single-person households, driven mostly by Boomers losing their partners, will account for 62% of the net change in housing demand and to 2040 their share will be 54%.

Rental demand will increase as many Boomers choose that option, but mostly because growth in Greater Nashville will be attributable substantially to the "New Majority" whose home ownership rate is a third less than White Non-Hispanics. Between 2010 and 2025, renters will account for 37% of the net change in occupied housing demand, rising to 38% to 2040. In Davidson County, however, these figures are 71% and 75%, respectively, while in Suburban Nashville the figure is 31% for both periods. Part of this demand will be met by the conversion of currently owner-occupied homes becoming rentals, or many homes having split tenure where the owner lives in one part of the house and renters live in another.

Emerging market preferences for housing, communities and amenities is presented next.

Appendix A provides detailed tables on demographic changes, housing, and tenure demand between 2010 and 2025, and then to 2040.

PART 2
MARKET PREFERENCES WITH DEMAND TO 2030 AND 2040

According to a survey commissioned by the National Association of Realtors (NAR) and Smart Growth America in 2004 (Beldon Russonello & Stewart 2004), when asked what they want in a house about 70% of Americans say they prefer a large home on a large lot.[25] A more recent survey conducted in 2011, also commissioned by the NAR, finds that fully 80% of the respondents would prefer to live in a single-family detached home right now, if they had the option (Beldon Russonello & Stewart 2011). Yet when confronted with choices of neighborhood and housing attributes they most prefer, people's decisions differ. For instance, although nearly everyone wants to live in a single family detached home, the NAR's 2004 survey found that nearly half also wanted access to transit and to be able to walk to schools, and nearly 40% wanted a mix of housing opportunities.[26] These are features usually associated with smaller lots.

In this part, I synthesize surveys that try to determine what Americans generally, and more particularly what those who live in Tennessee and in selected neighboring states (Georgia, Kentucky, and North and South Carolina) want in their neighborhoods, communities, and their homes.

Two national surveys are reviewed. The first is from Porter-Novelli, an international consumer market analysis firm. Porter-Novelli surveyed a total of about 10,000 people for their preferences relating to community type and walking or biking to destinations in 2003 and 2005. The second is from the NAR and included about 2,000 respondents answering questions relating to housing preferences when trading off commuting time, amenities, and the ability to walk to places in 2011.[27] National preferences are compared to Tennessee and selected neighboring states[6].

I conclude this part with estimates of future housing needs based on preference surveys, and compare those needs with current supply.

Porter-Novelli

Porter-Novelli gauged market preferences for a variety of "smart growth" attributes, including the desirability of smart growth communities and the ability to walk or bike to work and shopping.[28] With 5,873 respondents in 2003 and 4,943 in 2005, the total of 10,816 responses compares favorably with the more typical 1,000 or 2,000 responses.

Assuming that the respondents are representative of their demographic and regional groups, we assembled profiles of behaviors and attitudes. These profiles tell us, for example, whether low-income single persons between 18 and 34 have different preferences for walking and biking than high-income households with children between 35 and 54.

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[25] See Gregg Logan, Stephanie Siejka, and Shyam Kannan, "The Market for Smart Growth." http://www.epa.gov/smartgrowth/pdf/logan.pdf**.**

[26] A sizable percentage wanted a detached home on a one-acre lot within walking distance of transit.

[27] We do not know if preferences today are any more or less than in the middle or late 2000s, nor do we know what people would be willing to tradeoff in 2025 or 2040. Surveys indicate central tendencies which we assume reasonably reflect current and future trade-off preferences. Future surveys will track changes in trade-offs preferences.

[28] Porter Novelli is a public relations company based in Washington, DC, www.porternovelli.com. We use their data with permission.

Of interest are two sets of questions asked in the Porter-Novelli surveys. The first addressed support for "smart growth" or "traditionally-designed" communities. The survey gives the following description with no title:

> *In recent years, there has been a greater interest in developing communities with a town design in place of today's suburbs. Such communities have a town center that is surrounded by residential neighborhoods. The town center has small shops, restaurants, government buildings, (places of worship), and public transit (bus, rail) stops. Residential neighborhoods are clustered around the town center, providing easy access to work and shopping. Each neighborhood has a variety of housing types (apartments, townhomes, single family homes) and houses are built on smaller lots and are closer to the street.*
>
> *Streets are designed to accommodate cars, pedestrians, and bicyclists. In residential areas streets are narrower, slower, and quieter with sidewalks, trees and on-street parking. In commercial areas, sidewalks are wide and comfortable, streets are lined with trees, and parking lots are less conspicuous. The community includes a network of parks and trails for walking and biking. It also has a clearly defined boundary in order to preserve open space for parks, farmlands, and forests.*

Respondents were asked "How much would you support the development of communities like this in your area?" responding to a seven-point scale from "would not support at all" (1) to "would fully support" (7). The midpoint (4) meant a respondent "would somewhat support" the development of communities like this. A second question asked "If there were communities like this available in your area, how much would you want to live in one?" where they were again asked to respond on a seven-point scale from "definitely not" (1) to "definitely would" (7) with the midpoint (4) being "maybe."

Because of the large sample size, we can assess preferences for key demographic groups across the nation. The future demographic make-up of the U.S. will be different from the middle 2000s, so I use the Porter-Novelli survey to assess the preferences of demographic subgroups. I chose to keep the categories and subgroups few in number for ease of use. Respondents are divided by age, income, and household type.

For age, I divided respondents into four groups: 18-34, 35-54, 55-69, and 70+. The age group 18-34 corresponds to a youthful population that is just staring out in life, building careers (including attending college), and starting families. Work by Myers and Ryu[29] suggests that by their early to middle 30s households slow dramatically in their propensity to relocate (2008). In the age group 35 to 54, people are more established in their careers and their neighborhoods and their children are older. Myers and Ryu report a constantly declining propensity to relocate from the middle 30s into the middle 50s. In contrast, people in the age group 55 to 69 are empty-nesters at the peak of their earning power, and the least likely to relocate among all the age groups. I use age 70 and above for seniors. Myers and Ryu's work shows that after decades of relative stability in their home situation, the propensity to relocate increases substantially and accelerates around age 70. When empty-nesters relocate, they tend to down-size significantly, sometimes more than once.

I use the U.S. Housing and Urban Development's (HUD) state-level area median income (AMI) figures for 2003 and 2005. Respondents with <80%-AMI are lower income, 80%-120% AMI are middle income, and >120% AMI are upper income.

Finally, I divided the population into households composed of single persons, and households with more than one person with and without children. This simple approach is similar to that used by Martha Farnsworth Riche, former Census Bureau director, in her work projecting demographic trends from 2000 to 2025 (2003).

These are very general groupings of a complex population. Notably lacking is a category for race and ethnicity. Yet, because of its high degree of correlation, income captures this reasonably well. We also note that by 2040, the share of people declaring themselves to be multi-race will be among the largest groups of minorities. We traded off precision for simplicity, and a high level of predictive accuracy for central tendencies or trends.

I also compare national results to respondents from Tennessee and selected adjacent states. (The sample size is not large enough to draw reliable results for Greater Nashville.) Table 2.1 shows the percentage of respondents who support smart growth communities, or who want to live in them.[30] Generally, about half of Americans would support smart growth communities *and* would want to live in them. The < 35 and 70+ age groups prefer the smart growth options slightly more than the middle age groups. Lower income people tend to prefer smart growth communities over higher income ones. There is very little variation among households by type.

Table 2.1 also reports results for Tennessee and selected adjacent states are reported in. There are some important differences with respect to the nation as a whole. While overall figures for both support for and preference to live in a smart growth community are comparable to the nation, by wide margins younger Tennesseans/selected state respondents (18-34) have greater support and preference than older ones (55-69 and especially 70+). Also by wider margins than the nation, middle and upper income households both support and prefer to live in smart growth communities.

[30] Sum of responses 4-7, "would somewhat support" through "would definitely support."

Table 2.1
U.S. and Tennessee/Adjacent Selected State Support for and Willingness to Live in Smart Growth Communities

Group	Would Support Smart Growth Community -- US	Would Support Mixed-Use, Walkable Community -- Tennessee/Adjacent Selected States	Want to Live in Smart Growth Community -- US	Want to Live in Mixed-Use, Walkable Community -- Tennessee/Adjacent Selected States
All	**51%**	**51%**	**47%**	**45%**
Age				
18-34	55%	57%	51%	51%
35-54	48%	52%	45%	44%
55-69	52%	45%	47%	38%
70+	59%	43%	56%	37%
Income				
Low	50%	49%	45%	45%
Mid	45%	50%	41%	42%
High	41%	57%	39%	46%
HH Type				
Single	50%	55%	48%	44%
With Children	52%	45%	46%	41%
No Children	52%	55%	46%	49%

Source: Porter-Novelli (2003; 2005) for the US. States include Georgia, Kentucky, North Carolina, South Carolina, Tennessee

National Association of Realtors

In 2004 and again in 2011, the National Association of Realtors (NAR) conducted national surveys of Americans' housing and community preferences given tradeoffs between options. The 2004 survey included about 1,000 respondents while the 2011 survey had more than 2,000 respondents. We focus on the 2011 survey in this report. Because of its smaller sample size, we will not be able to compare national and broader regional responses by key demographic features. For our analysis, we compare national preferences to those of respondents located in Tennessee and selected adjacent states.

A key element of the NAR survey was having respondents trade off attributes between two prototype communities. The survey asked the following question posed to respondents with results for the nation and Tennessee/selected adjacent states:

> *Imagine for a moment that you are moving to another community. These questions are about the kind of community you would like to live in. Please select the community where you would prefer to live.*

Community A *– There are only single-family houses on large lots. There are no sidewalks Places such as shopping, restaurants, a library, and a school (are) within a few miles of your home and you have to drive to most. There is enough parking when you drive to local stores, restaurants and other places. Public transportation, such as bus, subway, light rail, or commuter rail, is distant or unavailable.*

US	=	*43%*
TN-GA-KY-NC-SC	=	*45%*

Community B *– There (are) a mix of single-family detached houses, townhouses, apartments and condominiums on various sized lots. Almost all of the streets have sidewalks. Places such as shopping, restaurants, a library, and a school are within a few blocks of your home and you can either walk or drive. Parking is limited when you decide to drive to local stores, restaurants and other places. Public transportation, such as bus, subway, light rail, or commuter rail, is nearby*

US	=	*57%*[31]
TN-KY-NC-SC	=	*55%*

Responses are similar for the nation and Tennessee/selected adjacent states with 57% and 55% favoring Community B, respectively. Though the survey did not attach labels to them, Option B is known as the "smart growth" one. I note from the American Housing Survey that fewer than 20% of those living in the four largest metropolitan areas probably have this option.[32]

Unfortunately, the NAR's national sample[7] is not large enough to create a subset representing Greater Nashville. On the other hand, because current national and Greater Nashville conditions and demographic trends are reasonably similar, I can use the NAR's national stated preferences to guide estimates of demand for key housing types in Greater Nashville. Because of its large sample size, I can also decompose the national sample into key demographic subgroups to refine estimates of stated housing preferences among households with children, households without children (called "non-single person households without children"), and single-person households. The next three tables report housing preferences among these household types with respect to attached options (Table 2.3), accessibility to non-work destinations (Table 2.4), and commuting (Table 2.5). I synthesize these preferences in Table 2.6.

Table 2.2 shows that except for single-person households, 60% of Tennessee/selected adjacent state respondents prefer single-family detached homes over attached homes even given an easy walk to shops and restaurants, and a shorter commute to work. (Terms such as "easy walk" and "shorter commute" are left to the respondent to define in their own context.) Generally, about a third of households with children and 40% of non-single person households without children prefer the attached option under these conditions. But more than half (53%) of single person households would choose the attached options if these conditions were met.

Table 2.3 reports preferences for homes on larger or smaller lots given the tradeoff between having to drive to schools, shopping, open space and recreation (non-work destinations) or living in homes on

[31] Percentages exclude non-respondents.

[32] This is based on analysis of the most recent American Housing Survey publications for the Columbus MSA (2011). Because it takes several decades for urban form to be changed significantly, I assume forms evident in 2011 will persist into the later decades of the 21st century. See http://www.census.gov/housing/ahs/data/metro.html.

smaller lots and being able to walk to them. Generally, about 68-71% of Tennessee/selected adjacent state respondents prefer driving to non-work destinations if they can live in homes on larger lots. For single-person households, however, the preference falls somewhat to 63%.

Table 2.2
Preference for Attached Housing Options

All households	
Apartment or townhouse with easy walk to shops and restaurants and shorter commute to work	40%
Single-family detached home and have to drive to shops and restaurants, longer commute to work	60%
Households with children	
Apartment or townhouse with easy walk to shops and restaurants and shorter commute to work	32%
Single-family detached home and have to drive to shops and restaurants, longer commute to work	68%
Non-single person households without children	
Apartment or townhouse with easy walk to shops and restaurants and shorter commute to work	40%
Single-family detached home and have to drive to shops and restaurants, longer commute to work	60%
Single-person households	
Apartment or townhouse with easy walk to shops and restaurants and shorter commute to work	53%
Single-family detached home and have to drive to shops and restaurants, longer commute to work	47%

Source: Adapted from NAR (2011). Questions are paraphrased for brevity.

Table 2.3
Preference for Large or Small Lots Trading-Off Driving or Walking to Non-Work Destinations

Stated Preference Choice Options	Share
All households	
Larger lots and you have to drive to get to non-work places	68%
Smaller lots and it is easy to walk to get to non-work places	32%
Households with children	
Larger lots and you have to drive to get to non-work places	68%
Smaller lots and it is easy to walk to get to non-work places	32%
Non-single person households without children	
Larger lots and you have to drive to get to non-work places	71%
Smaller lots and it is easy to walk to get to non-work places	29%
Single-person households	
Larger lots and you have to drive to get to non-work places	63%
Smaller lots and it is easy to walk to get to non-work places	37%

Source: Adapted from NAR (2011). Questions are paraphrased for brevity.

Tennessee/selected state respondents' preference for larger or smaller lots with respect to commutes is reported in Table 2.4. Two very different choices are offered: a large home on a large lot with a 40+ minute commute to work and a small home on a small lot with a commute of less than 20 minutes. Generally, the smaller home and smaller lot with shorter commute option is preferred but the magnitude changes based on household type; about twice as many single-person households prefer the smaller home and lot with shorter commute option over the alternative. There are two moderating effects of interpreting these results to estimate overall housing preferences. First, distance from work accounts for perhaps about a quarter of the overall location decision-making process (see Boustan and Margo 2009). Second, according to the National Household Transportation Survey of 2009, a very small share of Tennessee/selected adjacent state commuters actually travel more than 40 minutes to work, while a plurality commute less than 20 minutes to work though an undetermined number of them may already live on smaller lots. I will reconcile this next.

Table 2.4
Home and Lot Size Preference with Respect to Long and Short Commutes to Work

Stated Preference Choice Options	Share
All households	
Larger home on larger lot where commute is more than 40 minutes	40%
Smaller home on smaller lot where commute is less than 40 minutes	60%
Households with children	
Larger home on larger lot where commute is more than 40 minutes	43%
Smaller home on smaller lot where commute is less than 40 minutes	57%
Non-single person households without children	
Larger home on larger lot where commute is more than 40 minutes	40%
Smaller home on smaller lot where commute is less than 40 minutes	60%
Single-person households	
Larger home on larger lot where commute is more than 40 minutes	36%
Smaller home on smaller lot where commute is less than 40 minutes	64%

Source: Adapted from NAR (2011). Questions are paraphrased for brevity.

Demand for Housing by Type to 2030 and 2040

The NAR survey can be used to create a typology of demand for residential units by type of unit for Greater Nashville as a whole. I estimate this as follows. I start first with the stated preference for attached homes, assuming amenities described earlier, by household type. The remaining demand will be for detached homes. The demand for homes on large and small lots is derived as follows. I combine tables 2.4 and 2.5, weighting Table 2.4 by 75% and Table 2.5 by 25% reflecting what research suggests as the share of residential location decision-making associated with commuting to work (see Boustan and Margo 2009). I then estimate the share of demand for attached and small and larger lot preference by major household type to 2025 and 2040 based on the number households by type reported in Section 1.This is shown in Table 2.5. Table 2.6 uses these distributions to estimate preferences for occupied housing units by broad type.

Missing from this analysis is an assessment of the current supply of housing by major type combined with an estimation of new units by type needed to meet demand in 2025 and 2040. From similar studies I have done for California's four largest metropolitan areas (Nelson 2011), all eight of California's Central Valley metropolitan areas (Nelson 2013b), Kansas City (Nelson 2012a), Columbus (Nelson 2013c), and Greensboro-Winston-Salem-High Point (Nelson 2012b), I find that up to all[8] new housing would need to be attached or small lot to meet estimated market demand to 2040.

Table 2.5
Stated Preference Shares for Major Housing Unit Types by Major Household Types to 2040

Household Type	Attached	Small Lot	All Other Lot	Growth Share to 2040
Households with children	32%	26%	42%	28%
Non-single person households without children	40%	22%	38%	38%
Single-person households	53%	21%	26%	34%
All households, growth-weighted	42%	23%	35%	

Source: Adapted from NAR (2011).

Table 2.6
Stated Preference Distribution for Major Housing Unit Types by Major Household Types 2010 to 2025 and to 2040

Household Type	Households	Attached	Small Lot	All Other
2025 Households and Demand				
Households with Children	279	89	73	117
Non-single person households without children	397	159	87	151
Single-Person Households	278	147	57	73
Total	954	395	217	341
Share		**41%**	**23%**	**36%**
2040 Households and Demand				
Households with Children	357	114	93	150
Non-single person households without children	481	192	106	183
Single-Person Households	353	187	73	93
Total	1,191	494	271	426
Share		**41%**	**23%**	**36%**

Source: Arthur C. Nelson.

I will next discuss nonresidential development trends.

PART 3
SPACE-OCCUPYING EMPLOYMENT AND NONRESIDENTIAL SPACE NEEDS

This Part of the report does three things. First, it identifies the kinds of jobs that occupy space. Second, it estimates the total number of workers (full- and part-time) who will occupy built space. Third, it estimates the space supported by workers in 2010 and projects space needs to 2025 and then to 2040. A special feature of this exercise is estimating the volume of space existing in 2010 that will be replaced and/or repurposed – I use the term recycled – to those years. As will be seen, the equivalent of more than the total nonresidential space existing in 2010 will be recycled by 2040.

Space-Occupying Employment Groups

My focus is on those jobs that need to be housed in built space, such as stores, offices, schools, and the like. Natural resource jobs such as farming, fishing and mining, do not usually require built space in which to work. Construction workers, who build the space people occupy, usually do not have space of their own; they rather move from job to job. I also do not address military jobs because, although they certainly occupy space, the planning and development of that space is mostly beyond the influence of local governments. The relevant jobs that occupy space can be loosely organized into four broad land-use groups: industrial, office/services, retail/food/lodging, and institutional. For the most part, local planning and zoning includes a wide range of land-uses within each of these four nonresidential groups. In the office group, for instance, local zoning codes usually do not differentiate between such activities as real estate or technical services, but they would restrict industrial and some institutional activities. Appendix B reports in detail how I group space-occupying employment into industrial, office, retail and lodging, and institutional categories for analysis.

Space-Occupying Employment Projections

Since the 1980s, no federal agency has projected employment over the long term and few commercial services do. Fortunately, Woods & Poole Economics has been making these kinds of projections for decades and I received permission to use their projections here. Woods & Poole reports jobs based on the Bureau of Economic Analysis (BEA) definition of what a job is: any person earning a living for which federal income tax forms are filed. This could be a full- or part-time person, or the same person holding multiple jobs. The Census Bureau's County Business Patterns, for instance, reports only the number of jobs claimed by firms with federal employment identification numbers principally for social security and unemployment purposes. The BEA definition is the most expansive.

Table 3.1 reports 2010 employment for each of the space-occupying groups, and projects employment to 2025 while Table 3.2 does the same to 2040. Three important trends among the employment groups emerge. Industrial job growth will fall, though not by much, following national trends. All other sectors will grow at or above the population growth rate. This is because people living outside the MSA will commute to those jobs, and there will be more part-time jobs formed as a percent of total jobs.

Table 3.1
Greater Nashville Space-Occupying Employment, 2010-2025
[Figures in thousands]

Sector	2010	2025	Change 2010-2025	Percent Change	Share of Change
Greater Nashville Study Area					
Industrial	151	165	14	10%	4%
Office/Services	461	631	170	37%	48%
Retail/Lodging/Food	201	272	71	35%	20%
Institutional	181	280	99	55%	28%
Total	994	1,348	354	36%	
Davidson County					
Industrial	69	72	4	5%	3%
Office/Services	231	288	57	25%	40%
Retail/Lodging/Food	96	114	18	19%	13%
Institutional	117	179	62	53%	44%
Total	513	654	141	27%	
Suburban Nashville					
Industrial	82	93	11	13%	5%
Office/Services	230	342	113	49%	53%
Retail/Lodging/Food	105	158	52	50%	25%
Institutional	64	101	37	59%	18%
Total	481	694	213	44%	

Source: Adapted from Woods & Poole Economics (2011).

Table 3.2
Greater Nashville Space-Occupying Employment, 2010-2040
[Figures in millions]

Sector	2010	2040	Change 2010-2040	Percent Change	Share of Change
Greater Nashville Study Area					
Industrial	151	176	25	16%	3%
Office/Services	461	856	395	86%	47%
Retail/Lodging/Food	201	360	159	79%	19%
Institutional	181	436	255	141%	31%
Total	994	1,828	834	84%	
Davidson County					
Industrial	69	74	5	7%	2%
Office/Services	231	351	120	52%	38%
Retail/Lodging/Food	96	131	35	36%	11%
Institutional	117	272	155	132%	49%
Total	513	827	314	61%	
Suburban Nashville					
Industrial	82	102	20	24%	4%
Office/Services	230	505	275	120%	53%
Retail/Lodging/Food	105	229	124	118%	24%
Institutional	64	164	100	158%	19%
Total	481	1,000	520	108%	

Source: Adapted from Woods & Poole Economics (2011).

I turn next to estimating the amount of space needed to accommodate these jobs.

Nonresidential Space Projections

Most workers need space within which to work. Government agencies need to fulfill many functions inside buildings. In most urbanized areas, nonresidential space accounts for a third or more of the built environment (excluding rights-of-ways and other public spaces), and half or more of the taxable value.[33] In this section, we estimate the nonresidential space needs.

Estimating employment-based space needs can be complex and fraught with uncertainties about how technology will influence the use of space in the future. The requirement for nonresidential space may be decreasing due to trends including working at home, telecommuting, internet retailing, even office

[33] Most states have homestead exemption policies resulting in assessed values for residential development being less than market value, with the effect of shifting then property tax burden to nonresidential development.

"hotelling" – wherein workers never have an assigned work area, but use space when needed based on the task and the need to be in an office.

Whether these factors increase the efficiency with which space is used, and result in less space needed in the future, is uncertain[9]. For example, working at home accounts for a very small share of workers despite its growing prevalence. In 1990, people working at home accounted for 3% of all workers, and in 2000 it was just 3.3%. Telecommuting does not necessarily reduce office space needs. Telecommuters may work from home part of a day or some days of the week but still have an office. Office hotelling applies only to workers who travel and need places to function on the road – but does this mean they need less space than if working in a permanent office or cubicle? Or does it mean more space is needed to meet their office needs when aggregated across several locations? There seems to be a debate on how small office worker stations will become, principally because of electronic filing and interactions that do not require meeting spaces, but there is no consensus. For one thing, productive people still need productive space to work in, and office buildings still need halls, meeting rooms, restrooms, lobbies, and so forth. Office buildings are also adding exercise space, day care facilities, and space for other activities. On the whole, we do not see much reduction in office space per worker though we assume it may go down some. I conclude that telecommuting will not be as significant a factor in job location as some have suggested, though the rate of working from home occasionally may increase (Nelson 2013).

Some also argue that Internet retailing[10] will reduce retail space needs substantially; I have a different view (Nelson 2013). Internet retailing continues to grow but its rate of growth in plateauing. It grew from practically nothing in the late 1990s to about five percent 15 years later. While it is true that whole retail sectors have vanished from the retail store market – especially record shops – other kinds of retail spaces have emerged, such as Apple and Microsoft stores. Most retail remains as it has for millennia – places for people to see, touch, and smell the goods. Moreover, Internet retail will not replace restaurants and bars where people like to socialize. My view is that while the nature of how retail space is used will change, its absolute volume per capita may not.

Overall, a decade of advances in telecommuting, office use, and retailing technologies has not reduced overall nonresidential space needs[11]. In fact, the trend seems to be for increasing square feet per person. Total nonindustrial space in the U.S. averaged 233 square feet per person in 1992 and 246 square feet per person in 2003 (Nelson 2004).[34]

To estimate space needs per work, I used the total square feet of space for each category of activities reported by the U.S. Department of Energy's Commercial Buildings Energy Consumption Survey (CBECS 2003)[35] and the Manufacturing Energy Consumption Survey (MECS 2006), and divided that space by workers in each activity group for the respective years. The result is the average square feet per worker for all workers in the industrial and nonindustrial categories reported in Table 3.3. These figures include vacant space, and other space used for ancillary purposes, such as building lobbies, rest rooms, staircases, and so forth. Many buildings also include exercise rooms, day care facilities, and so forth. I apply these figures to Woods & Poole's estimates of employees in each employee groups and aggregate them into a total amount of space that is estimated to be supported by the economy.

[34] The Energy Information Administration of the U.S. Department of Energy conducts a periodic stratified random sample Commercial Buildings Energy Consumption Survey of all nonindustrial buildings in the nation. Total space in 1992 was 69.7 billion square feet and for 2003 it was 71.7 billion square feet, or an average of 233 and 246 square feet per person for populations of 256.5 million and 290.8 million respectively.

[35] Unfortunately, 2003 is the last year for which reliable commercial data are available. See http://www.eia.gov/consumption/commercial/.

There is another consideration, however: nonresidential space is not as durable as residential units. The typical residential unit can last easily two centuries and perhaps several more. In contrast, the typical nonresidential space lasts on average around 40 to 45 years, as illustrated in Figure 3.1. Over time, nonresidential space will need to be recycled through demolition, rebuilding, or repurposing through renovations that renew the structure for different kinds of uses than for which it was originally built.

The speed with which nonresidential structures are recycled depends on two major factors: the rate of depreciation of the building and the rate of appreciation of the land on which it sits. Buildings depreciate at widely varying rates. Depreciation for most kinds of properties ranges from about 30 years to about 60 years.[36] But this assumes the structure is used until its intended purpose has run its course. In dynamic metropolitan areas, few nonresidential structures are used for their intended purpose through the expected useful life of the building. The reason is that as the structure depreciates, land value usually appreciates, and at some point the land is worth more than the structure. The owner of the structure may see a better return on investment by recycling the land use.

Table 3.3
U.S. Space Consumed per Industrial and Nonindustrial Worker[12]

Land Use	Square Feet Per Worker
Industrial	
Utilities	300
Manufacturing	900
Transportation & Warehousing	1,800
Wholesale Trade	1,300
Nonindustrial	
Office & Office-Based Services	300
Education and the Arts	750
Lodging/Food Service	720
Retail Trade	605
Health Care	500

Sources: Nonindustrial space estimated from CBECS (Energy Information Administration 2005) and industrial space estimated from CBECS and MECS (Energy Information Administration 2009).

Note: Space includes: all occupied areas such as work spaces, lobbies, conference rooms, assembly areas, hallways, elevator shafts, etc.; collateral service functions such as cafeterias, theaters, exercise and day care; and vacant space. Figures are rounded.

[36] Marshall & Swift, *Marshall Valuation Service* (2010).

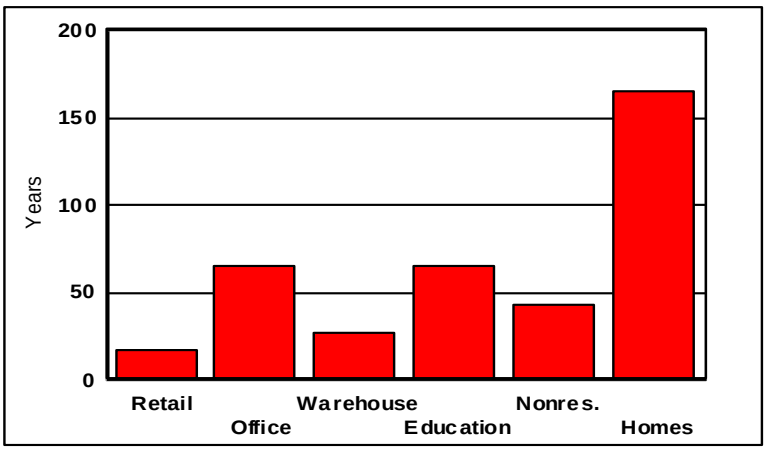

Figure 3.1
Life span of major building types

Source: Arthur C. Nelson based on Commercial Buildings Energy Consumption Survey (2006)

Consider how the recycling[13] decision is made. Assume the structure has a depreciable life of 50 years, which is a common period for nonresidential structures. Suppose that when the structure is built, about 80% of the total property value is in the structure itself and 20% is in the land. Suppose also that the average annual appreciation of land (after inflation) is 1%. A 50-year structure depreciating at 2% annually with land appreciating at 1% annually (compounded) – roughly the average annual rate of growth – will be worth less than the land in about the 33rd year. This is illustrated in Figure 3.2. It is at about the 25th year if not before that the property owner begins to consider demolishing and building a new structure, or renovating the existing structure (perhaps adding to it) to serve a higher and better use. We call this "recycling". However, the actual moment of recycling is often deferred until market forces justify the cost of demolition and reinvestment. Thus, assuming all the nonresidential stock is built for a 50-year useful life, the equivalent of the entire nonresidential stock in the U.S. recycles about every 40 years.[37]

For this analysis, we will assume that the average life of all nonresidential structures will be as illustrated in Figure 3.1. Certainly, some structures such as cheaply-built big box stores may become ripe for recycling after just 15 years or so, while Class-A, high-rise office buildings may last a century or longer. The average will underestimate the pace at which nonresidential structures will become ripe for recycling considering land value appreciation. In addition, we "start" the depreciation "clock" in 2010; that is we estimate ripeness for recycling assuming all existing structures were built in 2010. This will tend to underestimate the total supply of nonresidential structures that may be replaced or repurposed by 2030. However, I make one more adjustment based on the discussion for Figure 3.2. I estimate the average annual rate of metropolitan area population growth over the analysis period and use it to accelerate the conversion rate. Suppose the compounded rate of growth in a given metropolitan area over 20 years was 20%. Suppose further that the class of structure being depreciated is over a 50 year period. We therefore adjust the effective rate from 50 years to 40 years (50 x (1-0.20)).

[37] See the *Commercial Buildings Energy Consumption Survey* for 2003.

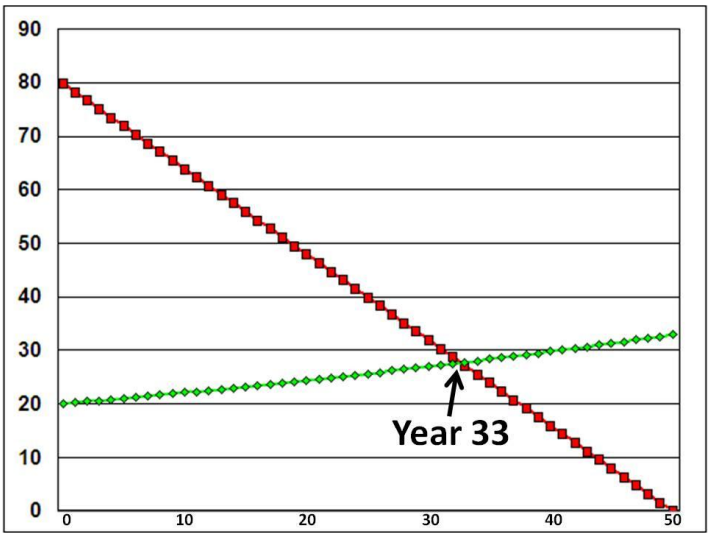

Figure 3.2
Conversion timing of nonresidential buildings

Note: Timing is based on structure depreciation (red line) and land value appreciation (green line)
Source: Arthur C. Nelson.

Table 3.4 reports the net change to the inventory of each nonresidential group, the volume of space that is estimated to be recycled, and the total space that is estimated to be built, rebuilt, or renovated for Greater Nashville, Davidson County, and Suburban Nashville to 2025, while Table 3.5 reports these figures for 2040. Jurisdictions comprising Greater Nashville will need to increase their inventory of nonresidential space by about 176 million square feet between 2010 and 2025 and nearly 400 million square feet to 2040. An even larger number, about 300 million and more than 800 million square feet will be recycled between 2010 and 2025 and 2040, respectively. For Greater Nashville as a whole, I estimate that nearly 500 million square feet of nonresidential space will be built or rebuilt between 2010 and 2025 and more than 1.2 billion square feet will be constructed between 2010 and 2040 – more than twice the volume of square feet supported in 2010, respectively. Davidson County and Suburban Nashville follow similar trends. These figures are reported in tables 3.4 and 3.5 respectively. Figure 3.3 illustrates trends for Greater Nashville to 2040.

Table 3.4
Greater Nashville Nonresidential Space Development 2010-2025
[Figures in millions]

Nonresidential Space	2010	2025	Change 2010-2025	Percent Change	Share of Change
Greater Nashville Study Area					
Space Supported	527	704	176	33%	37%
Space Recycled			295		63%
Total New Construction			471		
New Construction as Share of Space Supported 2010					**89%**
Davidson County					
Space Supported	297	358	60	20%	32%
Space Recycled			130		68%
Total New Construction			191		
New Construction as Share of Space Supported 2010					**64%**
Suburban Nashville					
Space Supported	230	346	116	50%	41%
Space Recycled			164		59%
Total New Construction			280		
New Construction as Share of Space Supported 2010					**122%**

Source: Arthur C. Nelson.

Table 3.5
Greater Nashville Nonresidential Space Development 2010-2040
[Figures in millions]

Nonresidential Space	2010	2040	Change 2010-2040	Percent Change	Share of Change
Greater Nashville Study Area					
Space Supported	527	925	398	75%	33%
Space Recycled			807		67%
Total New Construction			1,205		
New Construction as Share of Space Supported 2010					**228%**
Davidson County					
Space Supported	297	445	148	50%	32%
Space Recycled			310		68%
Total New Construction			458		
New Construction as Share of Space Supported 2010					**154%**
Suburban Nashville					
Space Supported	230	481	250	109%	34%
Space Recycled			497		66%
Total New Construction			747		
New Construction as Share of Space Supported 2010					**325%**

Source: Arthur C. Nelson.

Using assessor records provided to me, I conducted a detailed analysis of every nonresidential parcel in -Davidson County to estimate which ones may be opportunities for redevelopment by 2015, 2025 and 2040.[38] Parcel-specific results have been provided separately. Table 3.6 reports the overall analysis. For Davidson County, roughly 16% of the nonresidential space existing in 2013 may be an opportunity for redevelopment by 2015, up to 31% by 2025, and 64% by 2040. (The reason redevelopment opportunity figures are higher in Tables 3.4 and 3.5 is that many buildings constructed after 2013 will be demolished before 2025 and especially before 2040 – and in some instances structures on a given parcel may be replaced three times by 2040.) Because nonresidential spaces tend to be the same across urban landscapes, with the exception of downtowns, we may assume similar redevelopment opportunities will be available in Suburban Nashville.

[38] The analysis also allowed me to compare model results of estimated existing nonresidential inventory reported in tables 3.4 and 3.5 to the actual figures based on assessor records. In this case, the model appears to be accurate to within six percent.

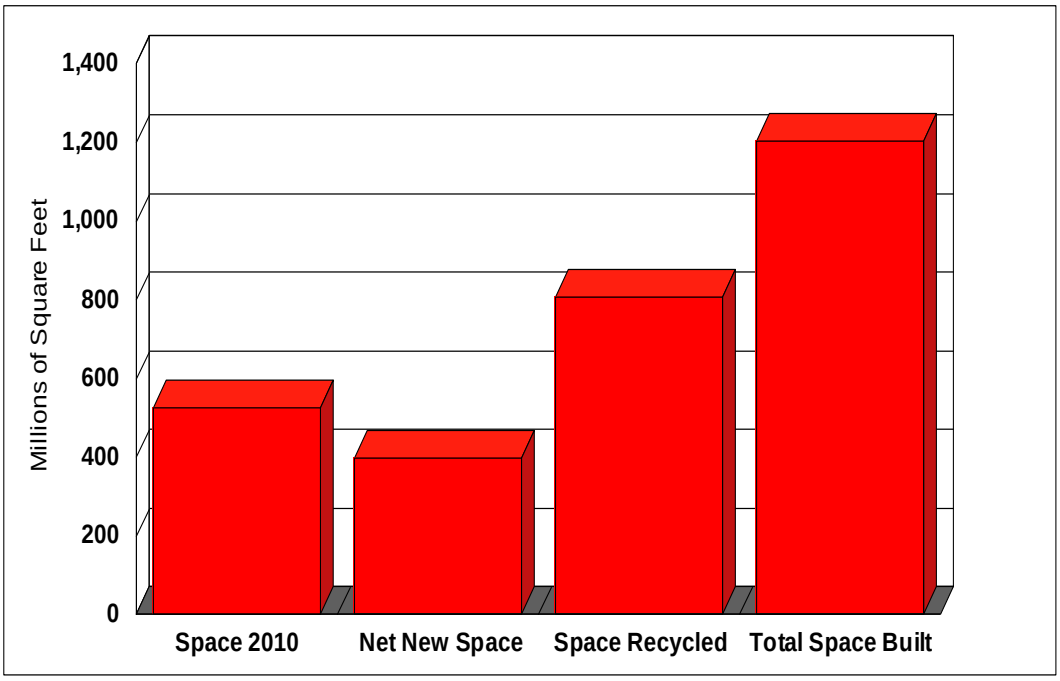

Figure 3.3
Nonresidential Development Projections for Greater Nashville, 2010-2040

Source: Arthur C. Nelson

Table 3.6
Aggregate Results of Parcel-Specific Analysis of Redevelopment Opportunities to 2040

Metric	Inventory 2013	2015	2025	2040
Total land area, acres	33,148			
Total land area potentially redevelopable		12,362	18,254	25,974
Percent land area		**37%**	**55%**	**78%**
Total building area, square feet (millions)	279			
Total building area potentially redevelopable		43.3	86.4	177.6
Percent building area		**16%**	**31%**	**64%**

Source: Arthur C. Nelson

Appendix C compares employment, space and redevelopment trends for space-occupying employment for Greater Nashville, Davidson County, and Suburban Nashville over the periods 2010 to 2025 and to 2040.

In Part 4, I outline a strategy to leverage the opportunity to redevelopment commercial corridors to meet the emerging demand for walkable communities, mixed-residential and mixed-use development, and transit accessibility.

PART 4
A STRATEGY TO MEET EMERGING MARKET DEMAND

Market trends (Part 1) and preference surveys (Part 2) allow us to conservatively estimate the built space demands for communities of the future. I estimate that at least a third of households in 2040 will want the option to live in walkable communities with mixed residential and mixed-use development, urban amenities (such as shops, restaurants, and services within walking distance), and transit options such as bus rapid transit, street car, and/or light rail. For short-hand, these can be called "smart growth" communities. Analysis of preference surveys in Part 2 showed that:

1. About half of Tennessee/selected adjacent state respondents both support and would want to live in "smart growth" communities. I estimate that no more than one in five have this option now.[39]

2. More than 40% of Greater Nashville households may want the option to live in attached housing units but only about a quarter have this option now.

In Part 3, I showed that, conservatively, the equivalent of about a third of all nonresidential space existing in 2010 will become candidates for redevelopment by 2025 rising to about two-thirds by 2040. I further estimate, conservatively, that half of these are one-floor structures and another one-quarter are two-floor structures.[40] One reason is that those structures are at very low floor-to-area-ratios (FAR). FAR is a measure of land-use intensity; it relates total building area to total land area. A structure of 100,000 square feet sitting on a parcel of 400,000 square feet has an FAR of 0.25. (For Greater Nashville, I estimate that about three-quarters of all nonresidential parcels have an FAR of less than 0.20, which means 80% of the land area is used for parking, loading, storage, and other non-structural purposes.) In my view, it is the sheer volume of nonresidential space to be recycled and the land it sits on that can substantially reshape Greater Nashville[14].

Research and real estate developers suggest that achieving FARs of 0.50 to 0.80 maximizes land-use intensity at low cost per square foot of structure, and provides adequate on-site parking especially if there are "smart parking" designs that share parking among activities, tuck-under parking options that avoid building parking structures (see Dunham-Jones and Williamson 2009; Williamson 2013). FARs above 1.00 can be achieved where there are reasonable transit options such as light rail, bus rapid transit, and/or streetcars. One of the key design opportunities possible in achieving FARs of more than 0.50 is mixed uses which can reduce and internalize vehicle trips. At FARs above 1.00, mixed uses can generate a quarter to a third fewer trips (Ewing and Cervero 2010).

The redevelopment opportunities presented by commercial corridors is largely under-estimated by both the public and private sectors. Public-private partnerships can be formed to leverage resources of both to meet emerging market demand. After all, much of the land-uses along these corridors have attributes making them ideal candidates for redevelopment:

1. They are already flat and reasonably well drained so this part of the development process is largely finished.

[39] This figure is based on the *American Housing Survey* which reports residential units within 300 feet of nonresidential structures, an indicator of mixed-use.

[40] Estimated based on the Commercial Buildings Energy Consumption Survey, http://www.eia.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/detailed_tables_2003.html.

2. Almost all of these sites sit along major highways with four or more lanes often with wide rights-of-way for easements. Because they are along multi-lane corridors that connect urban and suburban nodes, these sites are "transit-ready".

3. Large-scale utilities run along those major highways and are easily accessed for upgrading if needed. As they age, these utilities will need to be replaced. The conundrum facing local government is approving new greenfield development where initial utility capital costs are low or bracing for the upgrades of major utility infrastructure along built-out corridors that would have to be done anyway and at lower long-term cost per unit of service delivery. Prudent fiscal management would seem to favor the latter investment decision.

4. Prior development approvals have already committed these sites to development other than low-density residential development.

5. These sites have motivated owners interested in maximizing their return. This is important because impediments to redevelopment include the inability to assemble multiple, small ownerships, to gain the confidence of owners that it is in their best interest to redevelop, and to acquire clear title. This is not the case with most large commercially-developed sites.

6. As these sites age – and we know from above that most of them age rapidly – the deterioration of structures compromises the value of nearby residential property.

7. Those neighbors may be motivated to simultaneously deflect development pressure away from their neighborhoods into these aging commercial sites especially if they have a constructive say in how they are redeveloped. In other words, potential NIMBYs (not-in-my-backyard) may become YIMBYs (yes-in-my-backyard).

There are a number of qualifications and cautionary observations that can reduce redevelopment opportunities. For instance, tearing down the old to replace it with something more contemporary or at higher land-use intensity is not necessarily good in all cases. Preservation of neighborhoods to advance community character, create stability in the market, and even to elevate long term property values are among many reasons to preserve older structures. Nonetheless, many older structures sit on larger tracts of land that can be redeveloped, and older structures can be repurposed (from warehousing to office or residential) while retaining their historical and architectural character.[41] My purpose here is to offer the broad perspective that, for the most part, apply to most nonresidential development existing in urban and suburban areas that are not worth preserving, but instead are at the heart of meeting future development needs in Greater Nashville.

Second, will low-intensity parcels be redeveloped at a density to support walkable, mixed-use, transit-oriented neighborhoods? This is uncertain. In most metropolitan areas, land values increase over time at least in proportion to population growth and the higher the land value the more intensively land needs to be used to justify the cost of acquiring the property and redeveloping it. Indeed, a major road block to timely redevelopment is uncertainty by property owners about when to redevelop, usually erring on caution so that redevelopment is deferred perhaps longer than may be efficient. Public officials and

[41] See the National Trust for Historic Preservation, http://www.preservationnation.org/.

planners need to be proactive in identifying those parcels that may become ripe for redevelopment within various time frames, such as between 2010 and 2025, to 2040, and beyond.

Unfortunately, there is a third reason that property—both residential and nonresidential—is probably not efficiently redeveloped: local land use policies (Arora 2007). A study by the Transportation Research Board concludes that for business parks, a parking ratio of 2.0 per 1,000 square feet would be sufficient to take care of the overall needs, (Kuzmyak et al. 2003) yet regulations often call for far higher ratios.

The bottom line is that the place where much of this redevelopment can occur will be in suburbia. This is where most Greater Nashville residents live, where most of the jobs are found, and where most of the growth will occur. It is also mostly composed of low-rise structures along commercial corridors with occasional activity nodes, also at low intensity use. In *Retrofitting Suburbia*, Ellen Dunham-Jones and June Williamson (2008) and in *Designing Suburban Futures* (Williamson 2013) show how communities can turn transit-ready corridors into transit corridors and how we can also transform aging suburban centers into vibrant, mixed-use ones. Education and leadership may be needed from the transit and planning communities. In combination with some Greenfield new community development, much of Greater Nashville's development needs between 2010 and 2025 and 2040 can be accommodated by retrofitting suburbs, and do so without invading established residential neighborhoods. The challenge will be to create public-private-civic collaborations that can accomplish this.[15]

APPENDIX A
DEMOGRAPHIC AND HOUSING TRENDS 2010 TO 2025 AND TO 2040

Table A.1
Population Change 2010 to 2025 and to 2040
[Thousands of persons]

Metric	Greater Nashville	Davidson County	Suburban Nashville
Population 2010	1,761	628	1,133
Population 2025	2,427	720	1,707
Population 2040	3,097	813	2,283
Population Change, 2010-2025	666	92	574
Percent Population Change, 2010-2025	**38%**	**15%**	**51%**
Population Change, 2010-2040	1,335	185	1,150
Percent Population Change, 2010-2040	**76%**	**29%**	**101%**

Source: Adapted from Woods & Poole (2011)

Table A.2
New Majority Population Change 2010 to 2025 and to 2040
[Thousands of persons]

Metric	Greater Nashville	Davidson County	Suburban Nashville
White Non-Hispanic			
White Non-Hispanic Population 2010	1,306	369	937
White Non-Hispanic Population 2025	1,657	326	1,332
White Non-Hispanic Population 2040	1,896	261	1,635
White NH Population Change, 2010-2025	351	(43)	394
White NH Percent Change, 2010-2025	**27%**	**-12%**	**42%**
White NH Share of Population Change, 2010-2025	**53%**	**0%**	**100%**
White NH Population Change, 2010-2040	590	(108)	698
White NH Percent Change, 2010-2040	**45%**	**-29%**	**74%**
White NH Share of Population Change, 2010-2040	**44%**	**0%**	**100%**
New Majority			
New Majority Population, 2010	456	260	196
New Majority Population, 2025	770	394	376
New Majority Population, 2040	1,201	552	648
New Majority Population Change, 2010-2025	314	135	180
New Majority Percent Change, 2010-2025	**69%**	**52%**	**92%**
New Majority Share of Population Change, 2010-2025	**47%**	**20%**	**80%**
New Majority Population Change, 2010-2040	745	293	452
New Majority Percent Change, 2010-2040	**164%**	**113%**	**231%**
New Majority Share of Population Change, 2010-2040	**56%**	**22%**	**78%**

Source: Adapted from Woods & Poole (2011)

Table A.3
Senior Population Change 2010 to 2025 and to 2040
[Thousands of persons]

Metric	Greater Nashville	Davidson County	Suburban Nashville
Population 65+ 2010-2025			
Population 65+ 2010	182	66	117
Population 65+ 2025	342	86	256
Population 65+ Change 2010-2025	160	21	139
Population 65+ Percent Change 2010-2025	**88%**	**31%**	**119%**
Share of Net Growth of Population 65+ 2010-2025	**24%**	**22%**	**24%**
Population 65+ 2010-2040			
Population 65+ 2040	336	86	250
Population 65+ Change 2010-2040	154	21	133
Population 65+ Percent Change 2010-2040	**84%**	**32%**	**114%**
Share of Net Growth of Population 65+ 2010-2040	**12%**	**11%**	**12%**

Source: Adapted from Woods & Poole (2011)

Table A.4 - Household Change by Type 2010 to 2025 and to 2040
[Thousands of households]

Metric	Greater Nashville	Davidson County	Suburban Nashville
Baseline 2010			
Households 2010	680	260	420
Households 2025	954	304	650
Households 2040	1,191	336	855
Households with Children 2010	212	65	147
Households without Children 2010	468	195	273
Single-Person Households 2010	179	90	89
Change 2010-2025			
Households with Children 2025	279	69	210
Households with Children Change 2010-2025	67	4	63
Households with Children Percent 2010-2025	**32%**	**6%**	**43%**
Households with Children Share of Change 2010-2025	**24%**	**8%**	**28%**
Households without Children 2025	675	236	440
Households without Children Change 2010-2025	207	40	167
Households without Children Percent Change 2010-25	**44%**	**21%**	**61%**
Households without Children Share of Change 2010-25	**68%**	**94%**	**57%**
Single-Person Households 2025	278	109	169
Single-Person Households Change 2010-2025	99	19	79
Single-Person Households Percent Change 2010-2025	**53%**	**100%**	**62%**
Single-Person Households Share of Change 2010-25	**36%**	**44%**	**34%**
Change 2010-2040			
Households with Children 2040	357	80	277
Households with Children Change 2010-2040	145	15	130
Households with Children Percent Change 2010-2040	**19%**	**0%**	**23%**
Households with Children Share of Change 2010-2040	**28%**	**19%**	**30%**
Households without Children 2040	912	267	644
Households without Children Change 2010-2040	444	72	372
Households without Children Percent Change 2010-40	**81%**	**100%**	**77%**
Households without Children Share of Change 2010-40	**72%**	**81%**	**70%**
Single-Person Households 2040	353	127	227
Single-Person Households Change 2010-2040	174	37	137
Single-Person Households Percent Change 2010-2040	**97%**	**41%**	**154%**
Single-Person Households Share of Change 2010-40	**34%**	**49%**	**32%**

Source: Arthur C. Nelson

Table A.5
Household Change by Age 2010 to 2025 and to 2040
[Thousands of households]

Metric	Greater Nashville	Davidson County	Suburban Nashville
Change in Households by Age, 1990-2010			
Household Change	247	51	195
Change in Households <35	35	8	27
Change in Households 35-64	172	39	133
Change in Households 65+	41	5	36
Households <35 Change Share	**14%**	**16%**	**14%**
Households 35-64 Change Share	**69%**	**74%**	**68%**
Households 65+ Change Share	**17%**	**10%**	**18%**
Change in Households by Age, 2010-2025			
Household Change	274	44	230
Change in Households <35	50	6	45
Change in Households 35-64	85	19	67
Change in Households 65+	139	33	106
Households <35 Change Share	**18%**	**13%**	**19%**
Households 35-64 Change Share	**31%**	**42%**	**29%**
Households 65+ Change Share	**51%**	**45%**	**52%**
Change in Households by Age, 2010-2040			
Household Change	511	76	435
Change in Households <35	116	21	96
Change in Households 35-64	209	26	182
Change in Households 65+	186	29	157
Households <35 Change Share	**23%**	**27%**	**22%**
Households 35-64 Change Share	**41%**	**35%**	**42%**
Households 65+ Change Share	**36%**	**38%**	**36%**

Source: Arthur C. Nelson

Table A.6
Housing Unit Change 2010 to 2025 and to 2040
[Thousands of housing units]

Metric	Greater Nashville	Davidson County	Suburban Nashville
Baseline Conditions 2010			
Housing Units Existing	735	284	451
Housing Units Supported	726	259	467
Difference in Housing Units	(9)	(25)	16
Change 2010-2025			
Units Supported	1,006	326	679
Net Change to Inventory	271	42	228
Percent Change to Inventory	**37%**	**15%**	**51%**
Percent of Units in 2010 Replaced	**7%**	**6%**	**8%**
Units Replaced	54	17	36
Total New Units Needed	324	60	265
Housing Units Built as Share of Supply in 2010	**44%**	**21%**	**59%**
Change 2010-2040			
Units Supported	1,256	364	892
Net Change to Inventory	521	80	441
Percent Change to Inventory	**71%**	**28%**	**98%**
Percent of Units in 2010 Replaced	**18%**	**13%**	**21%**
Units Replaced	130	37	93
Total New Units Needed	651	117	534
Housing Units Built as Share of Supply in 2010	**89%**	**41%**	**118%**

Source: Arthur C. Nelson

Table A.7
Housing Tenure 2010 to 2025 and to 2040
[Thousands of persons]

Metric	Greater Nashville	Davidson County	Suburban Nashville
Baseline 2010			
Households	680	260	420
Owners	450	145	305
Renters	229	115	115
Ownership Rate	**66.2%**	**55.9%**	**72.6%**
Renter Rate	**33.8%**	**44.1%**	**27.4%**
Tenure Analysis 2010-2025			
Homeowners	623	158	465
Renters	331	146	185
Ownership Rate	**65.3%**	**52.0%**	**71.5%**
Renter Rate	**34.7%**	**48.0%**	**28.5%**
Change in Homeowners	173	13	160
Change in Renters	102	31	70
Total Change in Households	274	44	230
Owner Share of Change	**63%**	**29%**	**69%**
Renter Share of Change	**37%**	**71%**	**31%**
Tenure Analysis 2010-2040			
Homeowners	769	164	604
Renters	422	172	250
Ownership Rate	**64.5%**	**48.9%**	**70.7%**
Renter Rate	**35.5%**	**51.1%**	**29.3%**
Change in Homeowners	318	19	300
Change in Renters	193	57	136
Total Change in Households	511	76	435
Owner Share of Change	**62%**	**25%**	**69%**
Renter Share of Change	**38%**	**75%**	**31%**

Source: Census, Arthur C. Nelson

APPENDIX B
SPACE-OCCUPYING GROUPS

Industrial Group

Here we describe the kinds of jobs comprising the industrial sectors for which we synthesize employment projections. Our employment and associated space needs for industrial development includes the following NAICS two-digit codes (unless otherwise noted) published by the Bureau of Economic Analysis of the U.S. Department of Commerce:

Utilities NAICS sector 22 sector includes establishments engaged in the provision of the following utility services: electric power, natural gas, steam supply, water supply, and sewage removal. Within this sector, the specific activities associated with the utility services provided vary by utility: electric power includes generation, transmission, and distribution; natural gas includes distribution; steam supply includes provision and/or distribution; water supply includes treatment and distribution; and sewage removal includes collection, treatment, and disposal of waste through sewer systems and sewage treatment facilities.

Manufacturing This sector includes all firms and employment in NAICS sectors 31-33. These establishments are usually described as plants, factories, or mills and often use power driven machines and materials handling equipment. Establishments engaged in assembling component parts of manufactured products are also considered manufacturing if the new product is neither a structure nor other fixed improvement. Also included is the blending of materials, such as lubricating oils, plastics resins, or liquors. The materials processed by manufacturing establishments include products of agriculture, forestry, fishing, mining, and quarrying as well as products of other manufacturing establishments. The new product of a manufacturing establishment may be finished in the sense that it is ready for utilization or consumption, or it may be semi-finished to become a raw material for an establishment engaged in further manufacturing. For example, the product of the copper smelter is the raw material used in electrolytic refineries; refined copper is the raw material used by copper wire mills; and copper wire is the raw material used by certain electrical equipment manufacturers.

Wholesale trade NAICS sector 42 comprises establishments engaged in wholesaling merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. The merchandise described in this sector includes the outputs of agriculture, mining, manufacturing, and certain information industries, such as publishing. The wholesaling process is an intermediate step in the distribution of merchandise. Wholesalers are organized to sell or arrange the purchase or sale of (a) goods for resale (i.e., goods sold to other wholesalers or retailers), (b) capital or durable non-consumer goods, and (c) raw and intermediate materials and supplies used in production.

Transportation and warehousing The Transportation and Warehousing sector, NAICS 48-49, includes industries providing transportation of passengers and cargo, warehousing and storage for goods, scenic and sightseeing transportation, and support activities related to modes of transportation. Establishments in these industries use transportation equipment or transportation related facilities as a productive asset. The type of equipment depends on the mode of transportation. The modes of transportation are air, rail, water, road, and pipeline. The Transportation and Warehousing sector distinguishes three basic types of activities: subsectors for each mode of transportation, a subsector for warehousing and storage, and a subsector for establishments providing support activities for transportation. In addition, there are subsectors for

establishments that provide passenger transportation for scenic and sightseeing purposes, postal services, and courier services.

Office and Office-Based Services Group

Several activities comprise the office land-use group. Building spaces are often fungible between these activities.

Information The Information sector, NAICS 51, comprises establishments engaged in the following processes: (a) producing and distributing information and cultural products, (b) providing the means to transmit or distribute these products as well as data or communications, and (c) processing data. The main components of this sector are the publishing industries, including software publishing, and both traditional publishing and publishing exclusively on the Internet; the motion picture and sound recording industries; the broadcasting industries, including traditional broadcasting and those broadcasting exclusively over the Internet; the telecommunications industries; Web search portals, data processing industries, and the information services industries. The expressions 'information age" and "global information economy" are used with considerable frequency today. The general idea of an "information economy" includes both the notion of industries primarily producing, processing, and distributing information, as well as the idea that every industry is using available information and information technology to reorganize and make them more productive.

Finance and insurance The Finance and Insurance sector, NAICS 52, comprises establishments primarily engaged in financial transactions (transactions involving the creation, liquidation, or change in ownership of financial assets) and/or in facilitating financial transactions. Three principal types of activities are identified:

1. Raising funds by taking deposits and/or issuing securities, and in the process, incurring liabilities. Establishments engaged in this activity use raised funds to acquire financial assets by making loans and/or purchasing securities. Putting themselves at risk, they channel funds from lenders to borrowers and transform or repackage the funds with respect to maturity, scale, and risk. This activity is known as financial intermediation.
2. Pooling of risk by underwriting insurance and annuities. Establishments engaged in this activity collect fees, insurance premiums, or annuity considerations; build up reserves; invest those reserves; and make contractual payments. Fees are based on the expected incidence of the insured risk and the expected return on investment.
3. Providing specialized services facilitating or supporting financial intermediation, insurance, and employee benefit programs.

In addition, monetary authorities charged with monetary control are included in this sector.

Real estate and rental and leasing The Real Estate and Rental and Leasing sector, NAICS 53, comprises establishments primarily engaged in renting, leasing, or otherwise allowing the use of tangible or intangible assets, and establishments providing related services. The major portion of this sector comprises establishments that rent, lease, or otherwise allow the use of their own assets by others. The assets may be tangible, as is the case of real estate and equipment, or intangible, as is the case with patents and trademarks. This sector also includes establishments primarily engaged in managing real estate for others, selling, renting and/or buying real estate for others, and appraising real estate. These activities are closely related to this sector's main activity, and it was felt that from a production basis they would best be included here. In addition, a substantial proportion of property management is self-performed by lessors. The main components of this sector are the real estate lessors industries (including equity real estate

investment trusts (REITs)); equipment lessors industries (including motor vehicles, computers, and consumer goods); and lessors of nonfinancial intangible assets (except copyrighted works).

Professional and technical services The Professional, Scientific, and Technical Services sector, NAICS 54, includes establishments that specialize in performing professional, scientific, and technical activities for others. These activities require a high degree of expertise and training. The establishments in this sector specialize according to expertise and provide these services to clients in a variety of industries and, in some cases, to households. Activities performed include: legal advice and representation; accounting, bookkeeping, and payroll services; architectural, engineering, and specialized design services; computer services; consulting services; research services; advertising services; photographic services; translation and interpretation services; veterinary services; and other professional, scientific, and technical services.

Management of companies and enterprises The Management of Companies and Enterprises sector, NAICS 55, comprises (1) establishments that hold the securities of (or other equity interests in) companies and enterprises for the purpose of owning a controlling interest or influencing management decisions or (2) establishments (except government establishments) that administer, oversee, and manage establishments of the company or enterprise and that normally undertake the strategic or organizational planning and decision-making role of the company or enterprise. Establishments that administer, oversee, and manage may hold the securities of the company or enterprise. Establishments in this sector perform essential activities that are often undertaken, in-house, by establishments in many sectors of the economy. By consolidating the performance of these activities of the enterprise at one establishment, economies of scale are achieved.

Administrative and support services, and waste management
Administrative and support services, and waste management are included in NAICS sector 56. The Administrative and Support Services subsector, NAICS 561, comprises establishments performing routine support activities for the day-to-day operations of other organizations. These essential activities are often undertaken in-house by establishments in many sectors of the economy. The establishments in this sector specialize in one or more of these support activities and provide these services to clients in a variety of industries and, in some cases, to households. Activities performed include: office administration, hiring and placing of personnel, document preparation and similar clerical services, solicitation, collection, security and surveillance services, and cleaning. The administrative and management activities performed by establishments in this sector are typically on a contract or fee basis. These activities may also be performed by establishments that are part of the company or enterprise. Waste Management is included in NAICS subsector 562. It includes establishments primarily engaged in waste management and remediation services. These establishments also collect, treat and dispose of waste materials.[42] The sector excludes employment in federal or state or local government operated utilities and waste management establishments.

[42] The NAICS combines Administration and Waste Management in the same general category, 56, calling it Administrative Services and Waste Management. It seems to us it would have been more consistent with the actual economic activities to combine utilities with waste management. Instead, we need to manually remove Waste Management, Subsector 562, from NAICS 56. Interestingly, Waste Management employment is only about five percent of the share of total NAICS 56 employment so moving it to a classification more akin to what it actually does may have aided users of the data. However, few would argue that the Bureau of Economic Analysis is always logical in assembling and reporting data.

Other services, except public administration
The Other Services (except Public Administration) sector, NAICS 81, comprises establishments engaged in providing services not specifically provided for elsewhere in the classification system. Establishments in this sector are primarily engaged in activities, such as equipment and machinery repairing, promoting or administering religious activities, grant-making, advocacy, and providing dry cleaning and laundry services, personal care services, death care services, pet care services, photofinishing services, temporary parking services, and dating services. Private households that engage in employing workers on or about the premises in activities primarily concerned with the operation of the household are included in this sector.

Public Administration – Federal civilian, state and local
The Public Administration sector, NAICS 92, as used here, consists of establishments of federal, state, and local government agencies that administer, oversee, and manage public programs and have executive, legislative, or judicial authority over other institutions within a given area. These agencies also set policy, create laws, adjudicate civil and criminal legal cases, provide for public safety and for national defense. In general, government establishments in the Public Administration sector oversee governmental programs and activities that are not performed by private establishments. Establishments in this sector typically are engaged in the organization and financing of the production of public goods and services, most of which are provided for free or at prices that are not economically significant. This sector does not include federal military employment.

Retail Trade and Lodging Group
This land-use group includes the entire retail sector plus the accommodation and food service sector. Normally, food service is considered among retail trade land-uses while lodging may be addressed as a different land-use function. The NAICS, however, combines lodging with food service. In any event, food service employment outnumbers lodging employment nationally by six fold.

Retail trade NAICS sector 44 includes establishments engaged in retailing merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. The retailing process is the final step in the distribution of merchandise; retailers are, therefore, organized to sell merchandise in small quantities to the general public. This sector comprises two main types of retailers: store and non-store retailers.

Accommodation and Food service Accommodation and food service are included in the NAICS 72 sector. The Accommodation subsector, NAICS 721, includes hotels, motels, casino hotels, bed and breakfasts, campgrounds and recreational vehicle parks and other lodging places. The other sector, NAICS 722, includes eating and drinking places, including restaurants, bars, and take-out stands. Also included are caterers and food service contractors.

Institutional Group
The institutional land-use group includes public, private, and nonprofit activities in education, health care and social services, and arts, entertainment and recreation.

Educational services
The Educational Services sector, NAICS 61, comprises establishments that provide instruction and training in a wide variety of subjects. This instruction and training is provided by specialized establishments, such as schools, colleges, universities, and training centers. These establishments may be privately owned and operated for profit or not for profit, or they may be publicly owned and operated. They may also offer food and/or accommodation services to their students. Educational services are usually delivered by teachers or instructors that explain, tell,

demonstrate, supervise, and direct learning. Instruction is imparted in diverse settings, such as educational institutions, the workplace, or the home, and through diverse means, such as correspondence, television, the Internet, or other electronic and distance-learning methods. The training provided by these establishments may include the use of simulators and simulation methods. It can be adapted to the particular needs of the students. For example, sign language can replace verbal language for teaching students with hearing impairments. All industries in the sector share this commonality of process, namely, labor inputs of instructors with the requisite subject matter expertise and teaching ability.

Health care and social assistance The Health Care and Social Assistance sector, NAICS 62, comprises establishments providing health care and social assistance for individuals. The sector includes both health care and social assistance because it is sometimes difficult to distinguish between the boundaries of these two activities. The industries in this sector are arranged on a continuum starting with those establishments providing medical care exclusively, continuing with those providing health care and social assistance, and finally finishing with those providing only social assistance. The services provided by establishments in this sector are delivered by trained professionals. All industries in the sector share this commonality of process, namely, labor inputs of health practitioners or social workers with the requisite expertise. Many of the industries in the sector are defined based on the educational degree held by the practitioners included in the industry.

Arts, entertainment, and recreation The Arts, Entertainment, and Recreation sector, NAICS 71, includes a wide range of establishments that operate facilities or provide services to meet varied cultural, entertainment, and recreational interests of their patrons. This sector comprises (1) establishments that are involved in producing, promoting, or participating in live performances, events, or exhibits intended for public viewing; (2) establishments that preserve and exhibit objects and sites of historical, cultural, or educational interest; and (3) establishments that operate facilities or provide services that enable patrons to participate in recreational activities or pursue amusement, hobby, and leisure-time interests.

APPENDIX C
JOBS AND NONRESIDENTIAL DEVELOPMENT TRENDS 2010 TO 2025 AND TO 2040

Table C.1
Total Jobs and Nonresidential Development Trends, 2010-2030 and to 2040
[Jobs in thousands and square feet in millions]

Metric	Greater Nashville	Davidson County	Suburban Nashville
Baseline 2010			
Jobs 2010	994	513	481
Supported space	527	297	230
Jobs and Nonresidential Development 2010-2025			
Jobs 2025	1,348	654	694
Job Change	354	141	213
Job Percent Change	**36%**	**27%**	**44%**
Space Supported 2025	704	358	346
Space Inventory Change	176	60	116
Space Inventory Percent Change	**33%**	**20%**	**50%**
Space Replaced	295	130	164
Total Space Built	471	191	280
Space Built as Share of Space in 2010	**89%**	**64%**	**122%**
Jobs and Nonresidential Development 2010-2040			
Jobs 2040	1,828	827	1,000
Job Change	1,300	530	770
Job Percent Change	**247%**	**178%**	**335%**
Space Supported 2040	925	445	481
Space Inventory Change	398	148	250
Space Inventory Percent Change	**75%**	**50%**	**109%**
Space Replaced	807	310	497
Total Space Built	1,205	458	747
Space Built as Share of Space in 2010	**228%**	**154%**	**325%**

Source: Arthur C. Nelson.

REFERENCES AND SELECTED BIBLIOGRAPHY

AARP Public Policy Institute (1997). *Community Transportation Survey*. Washington, DC: Association of Retired Persons.

Adams, J. T. (1931). *The Epic of America*. New York: Little, Brown, and Co.

Alonso, W. (1964). *Location and Land Use: Toward a General Theory of Land Rent*. Cambridge, MA: Harvard University Press.

ARA National Seniors Housing Group (2011). *2011 Seniors Industry Outlook*. Dallas, TX: Apartment Realty Advisors. http://www.arausa.com/FTP/seniors/ARA%202011%20White%20Paper.pdf.

Arora, A. (2007). *Inventory of Policies Affecting Parking within the NYMTC Region.* New Brunswick, NJ: Bloustein School of Planning and Public Policy, Rutgers University.

Arrington, G. B. and R. Cervero (2011). *Effects of TOD on Housing, Parking, and Travel*. Washington, DC: Transportation Research Board. http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_128.pdf.

Ascierto, J. (2010). Market Movers: How the Emergence of Generation Y, the Aging of Baby Boomers, and Immigration Trends will Impact the Multi-Family Industry in the Next Decade. *Apartment Finance Today*,17-22.

Baldasarre, M. (2001). *PPIC Statewide Survey: Special Survey on Land Use.* San Francisco: Public Policy Institute of California.

Baldasarre, M. (2002). *PPIC Statewide Survey: Special Survey on Land Use.* San Francisco: Public Policy Institute of California.

Baldasarre, M. (2004). *Special Survey on Californians and Their Housing*. San Francisco: Public Policy Institute of California.

Bartholomew, K. (2007). Land Use-Transportation Scenario Planning: Promise and Reality, *Transportation*, 34(4), 397-412.

Bartholomew, K. (2005). *Integrating Land Use Issues into Transportation Planning: Scenario Planning—An Annotated Bibliography.* Salt Lake City, UT: University of Utah.

Bartholomew, K. and R. Ewing (2011). Hedonic Price Effects of Pedestrian- and Transit-Oriented Development. *Journal of Planning Literature* 26(1), 18-34.

Bartsch, K. J. (2009). The Employment Projections for 2008–18. *Monthly Labor Review* 132(11), 3-10.

Baxandall, P., T. Dutzik and J. Hoen (2008) *A Better Way to Go: Meeting America's 21st Century Transportation Challenges with Modern Public Transit*. Washington, D.C.: U.S. PIRG Education Fund and Frontier Group.

Baum-Snow , N. and M. E. Snow (2000). The Effects of New Public Projects to Expand Urban Rail Transit. *Journal of Public Economics,* 77, 241-263.

Belden Russonello and Stewart Research and Communications (2004) *2004 American Community Survey: National Survey on Communities Conducted for Smart Growth America and National Association of Realtors®*. Washington, DC: National Association of Realtors.

Belden Russonello & Stewart (2011). *Community Preference Survey*. Washington, DC: National Association of Realtors.

Ben-Joseph, Eran (2012). *Thinking a Lot: The Design and Culture of Parking*. Cambridge, MA: MIT Press.

Bettencourt, L. M. A.,J. Lobo, D. Helbing, C. Kuhnert and C and G. B. **West** (2007). Growth, Innovation, Scaling, and the Pace of Life in Cities. *Proceedings of the National Academy of Sciences* 104(17), 7301–7306.

Blais, Pamela (2010). *Perverse Cities: Hidden Subsidies, Wonky Policy, and Urban Sprawl*. Vancouver, BC: UBC Press.

Boustan, Leah Platt and Robert A. Margo (2009). Job Decentralization and Residential Location. In *Brookings-Wharton Papers on Urban Affairs: 2009* pp. 1-31. Washington, DC: Brookings Institution.

Bowes, David R. and Keith R. Ihlanfeldt (2001). Identifying the Impacts of Rail Transit Stations on Residential Property Values. *Journal of Urban Economics,* 50, 1-25.

Burchell, Robert W., *et al.* (2002). *The Costs of Sprawl—2000* (TRB Report No. 74). Washington, DC: National Academy Press.

Burchell, Robert W., *et al.* (1998). *The Costs of Sprawl—Revisited* (TRB Report No. 39). Washington, DC: National Academy Press.

Burchell, Robert W., Anthony Downs, Barbara McCann, and Sahan Mukherji (2005). *Sprawl Costs: Economic Impacts of Unchecked Development*. Washington, DC: Island Press.

Business, Transportation and Housing Agency (2002). *Statewide Transit-Oriented Development Study*. Sacramento, CA: California Department of Transportation. http://www.dot.ca.gov/hq/MassTrans/Docs-Pdfs/TOD-Study-Final-Rpt.pdf.

Canepa, Brian (2007). Bursting the Bubble: Determining the Transit-Oriented Development's Walkable Limits*", Transportation Research Record: Journal of the Transportation Research Board, No. 1992,* Washington DC:National Academy of Sciences, 28-34.

Carlino, Gerald, Satyajit Chatterjee, and Robert Hunt (2006). Urban Density and the Rate of Invention. WP 06-14. www.philadelphiafed.org/research-and-data/regional-economy/regional-research/index.cfm?tab=3.

Carruthers, J. I. and G. F. Ulfarsson (2003). Urban Sprawl and the Cost of Public Services. *Environment and Planning B: Planning and Design* 30, 503-522.

Census Bureau (2003). *Statistical Abstract of the United States*, Table HS-12.

Census Bureau (2008). *U.S. Population Projections*. Washington, DC: U.S. Department of Commerce. http://www.census.gov/population/www/projections/summarytables.html.

Census Bureau (2010a). *Current Population Survey, Annual Social and Economic and Social Supplements*. Washington, DC: U.S. Department of Commerce.

Census Bureau (2010b). *American Housing Survey for 2009*. Washington, DC: Department of Commerce.

Center for Transit-Oriented Development (2010*). Acquisition Fund Framework Study Final Report / San Francisco Bay Area Property Acquisition Fund for Equitable TOD*. Chicago: Center for Neighborhood Technology.

Center for Transit Oriented Development (2011). National TOD Database. Chicago: Center for Neighborhood Technology. http://toddata.cnt.org/.

Cervero, Robert, Steven Murphy, Christopher Ferrell, Natasha Goguts, Tu-Hsin Tsai, G.B. Arrington, John Boroski, Janet Smith-Heimer, Ron Golem, Pail Peninger, Eric Nakajima, Ener Chui, Robert Dunphy, Mel Myers, Shannon McKay, and Nicole Witenstein (2004). *Transit-Oriented Development in the United States: Experiences, Challenges, and Prospects*. TCRP Report 102. Washington, DC: National Academy Press.

Cervero, Robert and Michael Duncan (2002). Transit's Value-Added Effects: Light and Commuter Rail Services and Commercial Land Values. *Transportation Research Record,* 1805, 8-15.

Cervero, Robert *and* Samuel Seskin (1995). *An Evaluation of the Relationships between Transit and Urban Form. Research Results Digest 7*, Transit Cooperative Research Program, Transportation Research Board, National Research Council.

Ciccone, Antonio and Robert E. Hall (1996). Productivity and the Density of Economic Activity. American Economic Review, 86(1), 54-70.

Cisneros, Henry (2011). *Communities in Place Book Project*. http://longevity.stanford.edu/communities-in-place/book-project-in-collaboration-with-henry-cisneros-planning-to-stay-new-visions-of-aging-in-place.

Cobb, Rodney J. and Scott Dvorak (2000). *Accessory Dwelling Units: Model State Act and Local Ordinance.* Washington, DC: American Association of Retired Persons.

Cortright, Joe (2008). *Driven to the Brink: How the Gas Price Spike Popped the Housing Bubble and Devalued theSsuburbs*, Washington, DC: CEOs for Cities. www.ceosforcities.org/newsroom/pr/files/Driven%20to%20the%20Brink%20FINAL.pdf.

Cortright, Joe (2009). *Walking the Walk: How Walkability Raises Home Values in U.S Cities.* Washington, DC: CEOs for Cities. http://blog.walkscore.com/wp-content/uploads/2009/08/WalkingTheWalk_CEOsforCities.pdf.

Cowan, Tyler (2001). What is the Correct Intergenerational Discount Rate? Fairfax, VA: George Mason University, Department of Economics. http://www.gmu.edu/centers/publicchoice/faculty%20pages/Tyler/DISCOUNT.pdf.

Cudahy, Brian J. (1990) *Cash, Tokens, and Transfers: A History of Urban Mass Transit in North America*. New York: Fordham University Press.

Cunningham, Gail (2009). *Survey Reveals Long-Term Implications of Mortgage Meltdown. Washington, DC: National Foundation for Credit Counseling.* http://www.nfcc.org/newsroom/newsreleases/files09/HomeownershipSurvey.pdf.

Dalaker, Joseph (2001). *Poverty in the United States: 2000,* U.S. Census Bureau, Current Population Reports, Series P60-214, Washington, DC: U.S. Government Printing Office.

Day, Jennifer Cheeseman (1996). *Projections of the Number of Households and Families in the United States: 1995 to 2010,* U.S. Bureau of the Census, Current Population Reports, P25-1129, Washington, DC: U.S. Government Printing Office.

Debrezion , Ghebreegziabiher, Eric Pels, and Piet Rietveld (2007a). The Impact of Railway Stations on Residential and Commercial Property Value: A Meta-Analysis. *Journal of Real Estate Finance and Economics*, 35, 161-180.

Debrezion, Ghebreegziabiher, Eric Pels, and Piet Rietveld (2007b). The Effects of Railway Investments in a Policentric City: A Comparison of Competitive and Segmented Land Markets. *Environment and Planning A,* 39, 2048-2067.

DeNavas-Walt, Carmen, Bernadette D. Proctor, and Jessica C. Smith (2011), U.S. Census Bureau, Current Population Reports, P60-239, *Income, Poverty, and Health Insurance Coverage in the United States: 2010,* Washington, DC: U.S. Government Printing Office.

Diamond, Rick and Mithra Moezzi (1994). *Changing Trends: A Brief History of the U.S. Household Consumption of Energy, Water, Food, Beverages and Tobacco*. Berkeley, CA: University of California, Lawrence Berkeley National Laboratory.

Dittmar, H., and G. Ohland, eds. (2004). *The New Transit Town: Best Practices in Transit-Oriented Development,* Washington, DC: Island Press.

Downs, Barbara (2003). *Fertility of American Women: June 2002*. Current Population Reports, P20- 548. Washington, DC: U.S. Census Bureau.

Duany, A., E. Plater-Zyberk, and J. Speck, (2000). *Suburban Nation: The Rise of Sprawl and the Decline of the American Dream*. New York: North Point Press.

Dunham-Jones, Ellen and June Williamson (2008). *Retrofitting Suburbia: Urban Design Solutions for Redesigning Suburbs*. New York, NY: Wiley.

Economic Policy Institute (2011). Various tables. http://www.epi.org/.

Eggers, Frederick J. and Fouad Moumen. (2011). *Housing Units that Serve Both the Renter and Owner Markets*. Washington, DC: U.S. Department of Housing & Urban Development, Office of Policy Development & Research.

Energy Information Administration (2011). *EIA Weekly Petroleum Status Report* . (April 12, 2011) Washington, DC: U.S. Department of Energy.

http://www.eia.doe.gov/emeu/steo/pub/cf_query/steoNotes.cfm?formula=MGEIAUS&periodType=Annual&startYear=2000&startMonth=1&startQuarter=1&endYear=2012&endMonth=12&endQuarter=4.

Eno Transportation Foundation, Inc. (1996). Economic Returns from Transportation Investment. www.fhwa.dot.gov/policy/otps/060320a/index.htm.

Environmental Protection Agency (2001). *Our Built and Natural Environments*. EPA 123-R-01-002. Washington, D.C.:EPA.

Environmental Protection Agency (2006). *Parking Spaces / Community Places: Finding the Balance through Smart Growth Solution*. Washington, DC: EPA. http://www.epa.gov/smartgrowth/pdf/EPAParkingSpaces06.pdf.

Environmental Protection Agency (2007). *Measuring the Air Quality and Transportation Impacts of Infill Development*. Washington, DC.: EPA. www.epa.gov/dced/pdf/transp_impacts_infill.pdf.

Environmental Protection Agency (2009). *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2007*. Washington, DC: EPA. http://epa.gov/climatechange/emissions/usinventoryreport09.html.

Ewing, Reid (1997), Is Los Angeles-Style Sprawl Desirable? *Journal of the American Planning Association*, 63(1), 95-126.

Ewing, Reid (2009). Highway Induced Development: What Research in Metropolitan Areas Tells Us. Forthcoming in Transportation Research Record.

Ewing, Reid, Keith Bartholomew, Steve Winkelman, Jerry Walters and Don Chen (2008). *Growing Cooler: The Evidence on Urban Development and Climate Change*. Washington, DC: The Urban Land Institute.

Ewing, Reid, Rolf Pendall, and Don Chen (2002). Measuring Sprawl and its Impact. Washington, DC: Smart Growth America. http://www.smartgrowthamerica.org/resources/measuring-sprawl-and-its-impact/.

Ewing, Reid and Fang Rong (2008). The Impact of Urban Form on U.S. Residential Energy Use. *Housing Policy Debate* 19(1), 1-30.

Ewing, Reid, Tom Schmid, Richard Killingsworth, Amy Zlot, and Stephen Raudenbush (2003). Relationship Between Urban Sprawl and Physical Activity, Obesity, and Morbidity. *American Journal of Health Promotion.* 18(1),47–57.

Ewing, Reid & Robert Cervero (2010). Travel and the Built Environment, *Journal of the American Planning Association*, 76:3, 265-294.

Faiola, Anthony, Ellen Nakashima and Jill Drew (2008). "What Went Wrong?" *Washington Post*. http://www.washingtonpost.com/wp-dyn/content/article/2008/10/14/AR2008101403343.html?hpid=topnews&sid=ST2008101403344&s_pos=.

Fairfax County Dept. of Planning and Zoning (2005). Land Use and Development along the Rosslyn-Ballston Metro Corridor. www.fairfaxcounty.gov/dpz/tysonscorner/nofind/arlingdoc.pdf.

Farber, Nicholas and Douglas Shinkle (2011). *Aging in Place: A State Survey of Livability Policies and Practices*, Washington DC: AARP: Public Policy Institute and National Conference of State Legislatures.

Federal Highway Administration (2011). *2009 National Household Travel Survey*. Washington, DC: U.S. Department of Transportation.

Federal Reserve Board (2012). *Changes in U.S. Family Finances from 2007 to 2010: Evidence from the Survey of Consumer Finances*, Washington, DC: Federal Reserve Board. http://www.federalreserve.gov/pubs/bulletin/2012/pdf/scf12.pdf.

Federal Transit Administration (2000). *Transit Benefits 2000 Working Papers*: *A Public Choice Policy Analysis.* Washington, DC: Federal Transit Administration.

Fejarang, R.A. (1994). *Impact on Property Values: A Study of the Los Angeles Metro Rail*. Washington, DC: Transportation Research Board.

Fergsuson, Ronald F. and William T. Dickens, eds. (1999), *Urban Problems and Community Development.* Washington, DC: Brookings Institution.

Frank, James E. (1989). *The Costs of Alternative Development patterns: A Review of the Literature*. Washington, DC: Urban Land Institute.

Frumkin, Howard, Lawrence D. Frank, and Richard Jackson (2004). *Urban Sprawl and Public Health: Designing, Planning, and Building for Healthy Communities.* Washington, DC: Island Press.

Glaeser, Edward (2011). *Triumph of the City: How Our Greatest Invention Makes Us Richer, Smarter, Greener, Healthier, and Happier.* New York: Macmillan.

Glaeser, Edward L. (2011) "Goodbye, Golden Years". New York Times. http://www.nytimes.com/2011/11/20/opinion/sunday/retirement-goodbye-golden-years.html?pagewanted=all.

Glaeser, Edward L. and Matthew E. Kahn (2003). *Sprawl and Urban Growth, Discussion Paper Number 2004*. Cambridge, MA: Harvard University, Harvard Institute of Economic Research. http://www.economics.harvard.edu/pub/hier/2003/HIER2004.pdf.

Glaeser, Edward L and David C. Mare (2001) Cities and Skills. *Journal of Labor Economics*, 19(2), 316-342.

Goldin, Claudia (2004). The Long Road to the Fast Track: Career and Family, Mommies and Daddies on the Fast Track: Success of Parents in Demanding Professions, Special Issue of *The Annals of the Amer. Acad. of Political and Social Science*, 596, 246-47.

Hamilton B. E., J. A. Martin and S .J. Ventura (2009). Births: Preliminary data for 2007. *National vital statistics reports*, (57)12, Hyattsville, MD: National Center for Health Statistics.

Handy, S.L., M. G. Boarnet, R. Ewing, and R. E. Killingsworth (2002). How the Built Environment Affects Physical Activity: Views from Urban Planning. *American Journal of Preventative Medicine* 23(2 Suppl):64-73.

Handy, S., J. Sallis, D. Weber, E. Maibach, and M. Hollander (2008). Is Support for Traditionally Designed Communities Growing? Evidence from Two National Surveys. *Journal of the American Planning Association*, (74)2, 209-221.

Harris, Timothy F. and Yannis M. Ioannides (2002). *Productivity and Metropolitan Density*, Medford, MA: Tufts University, Department of Economics.

Harvard Joint Center for Housing (2011). *State of the Nation's Housing*. Cambridge, MA: Harvard University.

Hernandez, D., M. Lister and C. Suarez (2011). *Location Efficiency and Housing Type: Boiling it Down to BTUs*. Washington, DC: Environmental Protection Agency. http//.epa.gov/smartgrowth/location_efficiency_BTU.htm.

Hertsgaard, M. (2011). *Hot: Living Through the Next Fifty Years on Earth.* Boston: Houghton Mifflin Harcourt Publishing Co.

Holtzclaw, John, Robert Clear, Hank Dittmar, David Goldstein, David and Peter Haas (2002). Location Efficiency: Neighborhood and Socio-Economic Characteristics Determine Auto Ownership and Use - Studies in Chicago, Los Angeles and San Francisco. *Transportation Planning and Technology.* 25(1), 1-27.

Homeless Research Institute (2008), *Data Snapshot: Doubled Up in the United States.* www.endhomelessness.org.

Hu, Hsi-Hwa, Frank Wen, Simon Choi, SeongHee Min; and Jung H. Seo (2011). *Residential Land Use, Travel Characteristics, and Demography of Southern California*. Los Angeles, CA: Southern California Association of Governments.

ICF Consulting (2011). *Potential Changes in Emissions Due to Improvements in Travel Efficiency*, Contract No. EP-C-06-094, Transportation and Regional Programs Division, U.S. Washington, DC: Environmental Protection Agency. http://www.epa.gov/oms/stateresources/policy/420r11003.pdf.

Immergluck, Dan. (2011) *Foreclosed: High-Risk Lending, Deregulation, and the Undermining of America's Mortgage Market***.** Ithaca, NY: Cornell University Press.

Jackson, Kenneth (1985) *Crabgrass Frontier: The Suburbanization of the United States.* New York: Oxford University Press.

Jacobs, Harvey M. (1998). *Who Owns America?: Social Conflict over Property Rights* Madison, WI: University of Wisconsin Press.

Jaffe, Adam B, Manuel Trajtenberg and Rebecca Henderson (1993). Geographic Localization of Knowledge Spillovers as Evidenced by Patent Citations. *Quarterly Journal of Economics*, 108(3), 577-598.

Joint Center for Housing Studies (2011). *The State of the Nation's Housing 2010*. Cambridge, MA: Harvard University.

Jonathan Rose Companies. (2011) *Location Efficiency and Housing Type—Boiling it Down to BTUs.* http://epa.gov/smartgrowth/location_efficiency_BTU.htm.

Juergensmeyer, Julian and Conrad Juergensmeyer (1988). The Development of Regulatory Impact Fees: The Legal Issues, in *Development Impact Fees: Policy Rationale, Practice, Theory, and Issues*, Arthur C. Nelson ed., Chicago: American Planning Association.

Kamp, David (2009). "Rethinking the American Dream," *Vanity Fair*. http://www.vanityfair.com/culture/features/2009/04/american-dream200904.

Keenan, Teresa A. (2010). *Home and Community Preferences of the 45+ Population*. Washington, D.C.: American Association of Retired Persons.

Kim, Sukkoo (2007). Changes in the Nature of Urban Spatial Structure in the United States, 1890-2000, *Journal of Regional Science*, 47(2), 273-287.

Klosterman, Richard E. 1990. Community Analysis and Planning Techniques. New York: Rowman and Littlefield.

Kneebone, Elizabeth and Emily Garr (2010). *The Suburbanization of Poverty: Trends in Metropolitan America, 2000 to 2008*. Washington, DC: Brookings Institution.

Kneebone, Elizabeth and Alan Berube (2013). *Confronting Suburban Poverty*. Washington, DC: Brookings Institution.

Kuzmyak, J. Richard, Rachel Weinberger, Richard H. Pratt, and Herbert S. Levinson (2003). *Parking Management and Supply Traveler Response to Transportation System Changes*. TCRP Report 95. Washington, DC: Transportation Research Board.

Leinberger, C. (2007a) *Option of Urbanism*. Washington, DC: Island Press.

Leinberger, Christopher (2007b). *Back to the Future: the Need for Patient Equity in Real Estate Development Finance*. Washington, DC: Brookings Institution.

Leinberger, C. (2010). Here Comes the Neighborhood, *Atlantic.* http://www.theatlantic.com/magazine/archive/2010/06/here-comes-the-neighborhood/8093/.

Lennertz, Bill and Aarin Lutzenhiser (2006). *The Charrette Handbook*. Chicago: American Planning Association.

Levy, Stephen (2010). *Regional Employment, Population, and Households Projections in the SACOG Region, 2008-2035*, Sacramento: Sacramento Area Council of Governments.

Li F., P. Harmer, B. J. Cardinal, M. Bosworth, D. Johnson-Shelton, J. M. Moore, A. Acock, and N. Vongjaturapat (2009). Built Environment and 1-year change in Weight and Waist Circumference in Middle-aged and Older Adults: Portland Neighborhood Environment and Health Study. *American Journal of Epidemiology* 169(4), 409-12, discussion 413-4.

Lipman, Barbara (2006). *A Heavy Load: The Combined Housing and Transportation Burdens of Working Families*, Center for Housing Policy. http://www.nhc.org/pdf/pub_heavy_load_10_06.pdf.

Litman, Todd (2009) *Evaluating Transportation Economic Development Impacts: Understanding How Transportation Policies and Planning Decisions Affect Productivity, Employment, Business Activity, Property Values and Tax Revenues*, Victoria Transport Policy Institute.

Litman, Todd (20010a). *Land Use Impacts On Transportation*. Victoria, BC: Victoria Transport Policy Institute. http://www.vtpi.org/landtravel.pdf.

Litman, Todd (2010b). *Affordable-Accessible Housing In A Dynamic City: Why and How To Support Development of More Affordable Housing In Accessible Locations*. Victoria, BC: Victoria Transport Policy Institute. http://www.vtpi.org/aff_acc_hou.pdf.

Litman, Todd (2012). *Evaluating Criticism of Smart Growth*. Victoria, BC: Victoria Transport Policy Institute. http://www.vtpi.org/sgcritics.pdf.

Lodl, Kathleen Ann, Betsy S. Gabb and E. Raedene Combs (2005). The Importance of Selected Housing Features at Various Stages of the Life Cycle. *Journal of Family and Economic Issues* 11(4), 383-395.

Los Angeles County, CA (2009). *Los Angeles County Small Lot Subdivision Program Feasibility Study*. http://planning.lacounty.gov/assets/upl/official/official_20091001_small-lot-subdivision-response.pdf.

Lucas, Robert E, Jr. and Esteban Rossi-Hansberg (2002). On the Internal Structure of Cities. *Econometrica* 70(4), 1445-1476.

Mallach, Alan (2009), *Stabilizing communities: A Federal Response to the Secondary Impacts of Foreclosure*, Washington DC: Brookings Institution. //http:www.brookings.edu/reports/2009/02_foreclosure_crisis_mallach.aspx.

Malizia, E. and S. Exline (2000). *Consumer Preferences for Residential Development Alternatives*, Working Paper 2000-02, Chapel Hill, NC: Center for Urban and Regional Studies, University of North Carolina.

Malloy, Robin Paul (2008). *Private Property, Community Development, and Eminent Domain*. Aldershott, UK: Ashgate.

Marks, Stephen Gary (2011). *Valuing the Future:* Intergenerational *Discounting, its Problems, and a Modest Proposal* . Boston Univ. School of Law Working Paper No. 11-12. http://ssrn.com/abstract=1783729 or http://dx.doi.org/10.2139/ssrn.1783729.

Martin J. A., B. E. Hamilton, P. D. Sutton, S. J. Ventura (2009). *Final Data for 2006: National Vital Statistics Reports*,(57):7, Hyattsville, MD: National Center for Health Statistics.

Mathur, Shishir and Christopher E. Ferrell (2009). *Effect of Suburban Transit Oriented Developments on Residential Property Values*. San José, CA: Mineta Transportation Institute, San José State University. //http:www.transweb.sjsu.edu/MTIportal/research/publications/documents/Effects%20of%20Sub-Urban%20Transit%20%28with%20Cover%29.pdf.

McCann, Barbara A. and Reid Ewing (2003). *Measuring the Health Effects of Sprawl*. Washington, DC: Smart Growth America. http://www.smartgrowthamerica.org/report/HealthSprawl8.03.pdf.

McIlwain, John (2009). *Housing in America: The Next Decade.* Washington, D.C.: Urban Land Institute.

McKeever, Mike (2011). *White Paper on Changing National Demographics and Demand for Housing Types*, Sacramento, CA: Sacramento Area Council of Governments.

McKinsey and Company (2008). *IT3 Scenario Results and Implications*, Atlanta:State of Georgia General Assembly.

Mertens, Jean-Francois and Anna Rubinchick (2006). *Intergenerational Equity and the Discount Rate for Cost-Benefit Analysis*. Philadelphia, PA: University of Pennsylvania, Department of Economics. http://economics.sas.upenn.edu/events/intergenerational-equity-and-discount-rate-cost-benefit-analsis.

Metropolitan Transportation Commission (2007). *Station Area Planning Manual*. MTC: San Francisco, CA. http://www.bayareavision.org/.../Station_Area_Planning_Manual_Nov07.pdf.

Michael Y.L., E. M. Keast, H. Chaudhury, K. Day, A. Mahmood, A. F. Sarte (2009). Revising the Senior Walking Environmental Assessment Tool. *Preventive Medicine* 48(3), 247-9.

Minadeo, Dominic F. (2009). *Price Premiums and Mixed-Use Development*. Washington, DC: NAIOP Research Foundation. http://www.naiop.org/foundation/CTMTMixedUseResearch.pdf.

Molloy, Raven and Hui Shan (2011). *The Effect of Gasoline Prices on Household Location.* Washington, DC: Federal Reserve Board. https://federalreserve.gov/pubs/feds/2010/201036/201036pap.pdf.

Myers, Dowell. (2008). Immigrants and Boomers: Forging a New Social Contract for the Future of America. Russell Sage Foundation (New York).

Myers, Dowell. (2011). *The New Homegrown Majority in California: Now Seeking Generational Replacements*. Los Angeles, CA: Population Dynamics Research Group, University of Southern California. http://www.usc.edu/schools/sppd/research/popdynamics/pdf/2011_Myers_California-Homeownership.pdf.

Myers, Dowell, Elizabeth Gearin (2001). Current Preferences and Future Demand for Denser Residential Environments. *Housing Policy Debate.* 12(4), 633–659.

Myers, D. and S. H. Ryu.(2008). Aging of the Baby Boomers and the Generational Housing Bubble: Foresight and Mitigation of an Epic Transition. *Journal of the American Planning Association.* 74(1), 17-33.

National Alliance of Public Transportation Advocates. 2008. *Mobility for the Aging Population*. Washington, DC.

National Center for Public Policy and Higher Education (2007). *Per Capita Income of U.S. Workforce Projected to Decline IF Education Doesn't Improve*. Washington, DC: The Secretary of Education's Commission on the Future of Higher Education, U.S. Department of Education. http://www2.ed.gov/about/bdscomm/list/hiedfuture/reports/equity.pdf.

Nelson Arthur C. (1995). *System Development Charges for Water, Wastewater and Stormwater Systems*, Los Angeles: Los Angeles Times Publishing.

Nelson, Arthur C. (2006) Leadership in a New Era. *Journal of the American Planning Association*. 72(4), 393–407.

Nelson, Arthur C. (2009a) The New Urbanity: The Rise of a New America. *Annals of the Academy of Political and Social Science*.

Nelson, Arthur C. (2009b) Demographic Outlook for Multi-Family Housing. *Multifamily Trends*. Nov/Dec.

Nelson, Arthur C. (2010). Catching the Next Wave. *Generations: Journal of Aging and Society*. 33(4).

Nelson, Arthur C. (2013). *Reshaping Metropolitan America*. Washington, DC: Island Press.

Nelson, Arthur C. (2004). *Planners' Estimating Guide: Estimating Land-Use and Facility Needs*. Chicago: American Planning Association.

Nelson, Arthur C. and Mitchell Moody (2000). Effect of Beltways on Metropolitan Economic Activity. Journal of Urban Planning and Development 126(4), 189-196.

Nelson, Arthur C. Liza K. Bowles, Julian C. Juergensmeyer, and James C. Nicholas (2008). A Guide to Impact Fees and Housing Affordability. Washington, DC: Island Press.

Nelson, Arthur C. James C. Nicholas, and Julian C. Juergensmeyer (2009). *Impact Fees: Proportionate-Share Development Fees*, Chicago: American Planning Association.

Nicholas, James C., Arthur C. Nelson and Julian C. Juergensmeyer (1992). *A Practitioner's Guide to Development Impact Fees*, Chicago: American Planning Association.

Nicholls, R.J., P. P. Wong, V. R. Burkett, J. O. Codignotto, J. E. Hay, R. F. McLean, S. Ragoonaden and C. D. Woodroffe (2007). Coastal Systems and Low-Lying Areas. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden andC.E. Hanson, Eds., Cambridge, UK:Cambridge University Press, 315-356.

Norman, Jonathan, Heather L. MacLean, and Christopher A. Kennedy (2006). Comparing High and Low Residential Density: Life-Cycle Analysis of Energy Use and Greenhouse Gas Emissions. *Journal of Urban Planning and Development* 132(1), 10-21.

Norris, Nathan (2012). Why Gen Y is Causing the Great Migration of the 21st Century. *Better! Cities & Towns*, http://bettercities.net/news-opinion/blogs/nathan-norris/17803/why-gen-y-causing-great-migration-21st-century**.**

Parsons Brinkerhoff Quade and Douglas (1996). *Transit and Urban Form*. Washington, DC: National Academy Press.

Peiser, Richard (2001). Decomposing Urban Sprawl, *Town Planning Review* 76(3), 275-298.

Perk, Victoria A. and Martin Catalá (2009). *Land Use Impacts of Bus Rapid Transit: Effects of BRT Station Proximity on Property Values along the Pittsburgh Martin Luther King, Jr. East Busway*. Tampa, FL: National Bus Rapid Transit Institute, Center for Urban Transportation Research, University of South Florida. http://www.nbrti.org/docs/pdf/Property%20Value%20Impacts%20of%20BRT_NBRTI.pdf.

Pitkin, John, and Dowell Myers (2008). U.S. Housing Trends – Generational Changes and the Outlook to 2050. *Transportation Research Board Special Report 298*. Washington, DC: National Academy of Sciences.

Pollakowski, Henry O. et al. (2005). *Effects of Mixed-Income, Multi- Family Rental Housing Developments on Single Family Housing Values.* Cambridge, MA: MIT Center for Real Estate. http://web.mit.edu/cre/research/hai/pdf/40B_report_HAI_0405.pdf

Portland, City of (2008). *Portland Streetcar Development Oriented Transit.* http://www.portlandstreetcar.org/pdf/development_200804_report.pdf.

Rabianski, Joseph S. and J. Sherwood Clements (2007). *Mixed-Use Development: A Review of Professional Literature*. Washington, DC: National Association of Office and Industrial Parks. http://www.naiop.org/foundation/rabianski.pdf.

Raftelis, George A. (2005). *Water and Wastewater Finance and Pricing*, third ed. Los Angeles: CA: CRC Press.

Rampey, B.D., Dion, G.S., and Donahue, P.L. (2009). *NAEP 2008 Trends in Academic Progress* (NCES 2009–479). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. http://nces.ed.gov/nationsreportcard/pdf/main2008/2009479.pdf.

Rauch, James E (1993). Productivity Gains from Geographic Concentration of Human Capital: Evidence from the Cities. *Journal of Urban Economics* 34(3), 380-400.

RCLCO (2011). *Smart Growth Survey Analysis,* Bethesda, MD: RCLCO.

Real Estate Research Corporation. (1974). The Costs of Sprawl: Environmental and Economic Costs of Alternative Residential Development Patterns at the Urban Fringe. Washington D.C.: U.S. Government Printing Office.

Riche, M. F. (2003) "How Changes in the Nation's Age and Household Structure will Reshape Housing Demand in the 21st Century" in Office of Policy Development and Research (Ed.), *Issue Papers on Demographic Trends Important to Housing*. Washington, DC: Department of Housing and Urban Development, 125-147.

Rohe, William M. and Harry L. Watson (eds) (2007). *Chasing the American Dream: New Perspectives on Affordable Homeownership*. Ithaca, NY: Cornell University Press.

Sanchez, Thomas W. and Marc Brennan (2007). *The Right to Transportation: Moving to Equity*. Chicago: American Planning Association.

Sanchez, Thomas W. (1999). The Connection Between Public Transit and Employment: The Cases of Portland and Atlanta. *Journal of the American Planning Association*, 65(3), 284 – 296.

Schwartz, Alex (2007) *Housing Policy in the United States*. New York, NY: Routledge.

Shoup, Donald C. (2005). *The High Cost of Free Parking*. Chicago: American Planning Association.

Shoup, Donald C. (2010). Putting Cities Back on Their Feet. *Journal of Urban Planning and Development*, 136(3), 225-233.

Shrestha, Laura B. and Elayne J. Heisler (2009). *The Changing Demographic Profile of the United States.* RL32701. Washington, DC: Congressional Research Service, U.S. Congress. http://aging.senate.gov/crs/aging4.pdf.

Skufca, Laura (2008). *Is the Cost of Gas Leading Americans to Use Alternative Transportation?* Washington, DC: AARP Knowledge Management.

Steiner, Christopher. 2009. *$20 Per Gallon: How the Inevitable Rise in the Price of Gasoline Will Change Our Lives for the Better*. New York: Grand Central.

Sunshine, R. A (2009). *The Budget and Economic Outlook: Fiscal Years 2009 to 2019*. Washington, DC: Congressional Budget Office.

Surface Transportation Planning Process (2005). *Driven to Spend: Pumping Dollars out of Our Households and Communities*, http://www.transact.org/library/reports_pdfs/driven_to_spend/Driven_to_Spend_Report.pdf.

Sutton, Paul C. and Robert Costanza (2002). Global Estimates of Market and Non-Market Values Derived from Nighttime Satellite Imagery, Land Cover, and Ecosystem Service Valuation. *Ecological Economics*, 41, 509–527.

Swanstrom, Todd (2008). *The Road to Good Jobs: Patterns of Employment in the Construction Industry*, Transportation Equity Network and Public Policy Research Center, University of Missouri, St. Louis.

Tabors, Richard D. (1976). *Land Use and the Pipe*. Lexington, MA: Lexington Books.

Taylor, Paul, Jeffrey Passel, Richard Fry, Richard Morin, Wendy Wang, Gabriel Velasco, Daniel Dockterman (2010). *The Return of the Multi-generational Family Household*. Washington, DC: Pew Foundation.

Transportation for America (2011). *Aging in Place, Stuck without Options: Fixing the Mobility Crisis Threatening the Baby Boom Generation*. Washington, DC: Transportation for America.

Transportation Research Board (2009). *Driving and the Built Environment: The Effects of Compact Development on Motorized Travel, Energy Use, and CO2 Emissions*. Special Report 298. Washingtonm DC: Transportation Research Board, http://onlinepubs.trb.org/Onlinepubs/sr/sr298prepub.pdf.

Tu, Charles C. and Mark J. Eppli (1999). *Valuing New Urbanism: The Case of Kentlands.* Real Estate Economics, 23(3): 425–451.

Urban Land Institute (2010b). *Place Making through Infill and Corridor Redevelopment.* Washington, DC: Urban Land Institute.

Urban Land Institute (2011). *What's Next? Real Estate in the New Economy*. Washington, DC: Urban Land Institute.

Urban Land Institute and PricewaterhouseCoopers, *Emerging Trends in Real Estate* (2005, 2006, 2007, 2008, 2009, 2010, 2011). Washington, DC: Urban Land Institute.

U.S. Department of Housing and Urban Development (2008), *American Housing Survey for the United States: 2007*. Washington, DC: U.S. Government Printing Office.

U.S. Department of Housing and Urban Development (2010). *American Housing Survey for 2009.* Washington, DC: U.S. Government Printing Office.

U.S. Department of the Treasury. (2011). *Reforming America's Housing Finance Market: A Report to Congress*. Washington, DC: U.S. Government Printing Office.

Virginia Center for Housing Research (1995) *Retirement Relocation Among College Graduates: A Survey of Virginia Tech Alumni*. College of Architecture and Urban Studies, Virginia Tech (Blacksburg).

Voith, Richard (1998). Parking, Transit, and Employment in a Central Business District. Journal of Urban Economics 44(1), 43-48.

von Thünen, Johann Heinrich (1863). *Der Isolierte Staat in Beziehung auf Landwirschaft und Nationaloekonomie*. Munich: Pflaum.

Wheeler, Christopher H. (2005). *Cities and the Growth of Wages Among Young Workers*. St. Louis, MO: Federal Research Board of St. Louis. Working Paper 2005-055A http://research.stlouisfed.org/wp/2005/2005-055.pdf.

Williamson, June (2013). *Designing Suburban Futures*. Wasington, DC: Island Press.

Wilson, A. and R. Navaro (2007). Driving to Green Buildings: The Transportation Energy Intensity of Buildings. *Environmental Building News*, 16(9). http://www.buildinggreen.com/auth/article.cfm?fileName=160901a.xml.

Woods & Poole Economics (2011). *The Complete Economic and Demographic Data Source*, Washington, DC.