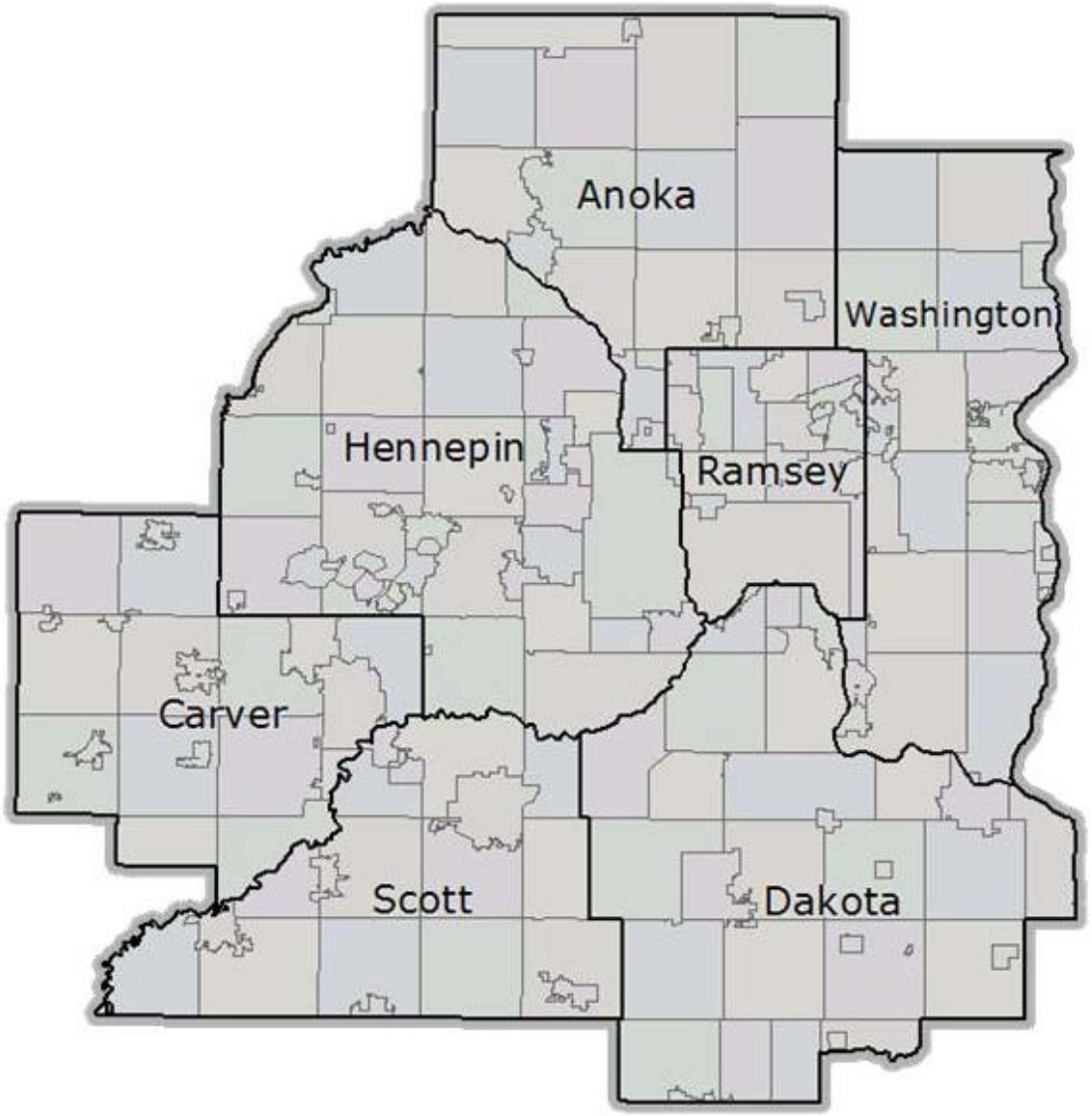
TWIN CITIES

Metropolitan Council Area Trends, Preferences, and Opportunities: 2010 to 2020, 2030 and 2040



Arthur C. Nelson, Ph.D., FAICP
June 10, 2014

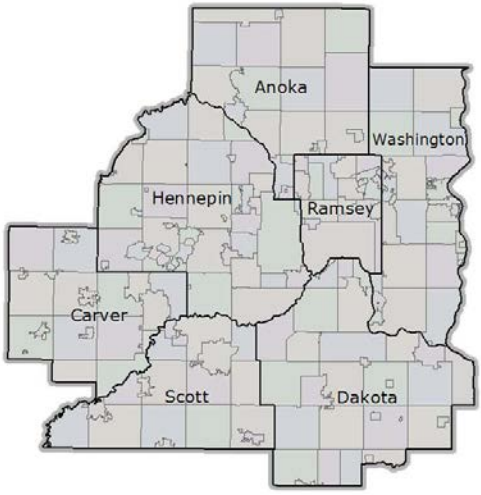
Prepared for Metropolitan Council, Community Development Committee

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Over the next three decades, the Twin Cities metro area will grow from 2.85 million to 3.67 million residents, or by about 29 percent. This is competitive with the nation's projected growth of 31 percent over the same period, and above average among major metros in the Midwest. Put differently, the Twin Cities metro area will account for 70 percent of Minnesota's growth to 2040. In all, nearly 400,000 households will be added. More than 700,000 space-occupying jobs will also be added, requiring more than 300 million square feet of net new enclosed space. With about 1.2 billion square feet of space requiring replacement, there will be about 1.5 billion square feet of nonresidential development during this period or about 1.5 times the total enclosed nonresidential space supported in 2010.

Figure A
Counties making up the Twin Cities Metro Area



For the metro area as a whole and the central and non-central counties, there will be important changes from 2010 to 2040:

- For the Twin Cities Metro area as a whole, senior citizens (65+) will account for 58 percent of the share of the population change between 2010 and 2040. In the central counties of Hennepin and Ramsey, seniors will account for 70 percent of the population change while for all other counties their share will be 47 percent. The aging of existing residents will be a dominant demographic change.

- The "new majority" demographic, comprising all racial and ethnic minorities, will account for nearly all net growth in the Metro area, all the growth in the central counties, and 77 percent of the growth in the non-central counties.

- Between 2010 and 2040, for the Metro area as a whole, households with children will account for 23 percent of the total household change while households without children will account for 77 percent. For the central counties the figures are to 21 percent and 79 percent respectively, while for the non-central counties the figures are 24 percent and 76 percent respectively. One-person households will account for 38 percent of the total change for the Metro area, 47 percent for the central counties, and 31 percent for the non-central counties.

As seen in Figure B:

- Between 1990 and 2010, households in their peak housing demand years (with residents between 35 and 64) accounted for about 80 percent of the growth in housing demand. But over a comparable 20-year period, from 2010 to 2030, that same group will account for just 9 percent of the growth in housing demand.

- From 1990 to 2010, downsizing households (with residents 65 and older) made up 20 percent of new housing demand. But over the next 20 years they will account for 85 percent of the demand share. Market research shows this segment prefers smaller homes on smaller lots or attached options.

The bottom line is that demographic shifts have been and remain influential drivers of the form, location, and nature of the region's development. Understanding these drivers and their implications for the built environment, and appropriately planning for and shaping the region's growth in recognition of these new drivers, are key to assessing the region's future needs. Consider:

- The number of households in the peak housing demand period of their life cycle (householders 35–64) grew by about 220,000 between 1990 and 2010. These are the households with families, peak incomes, and the desire for more space on larger lots.

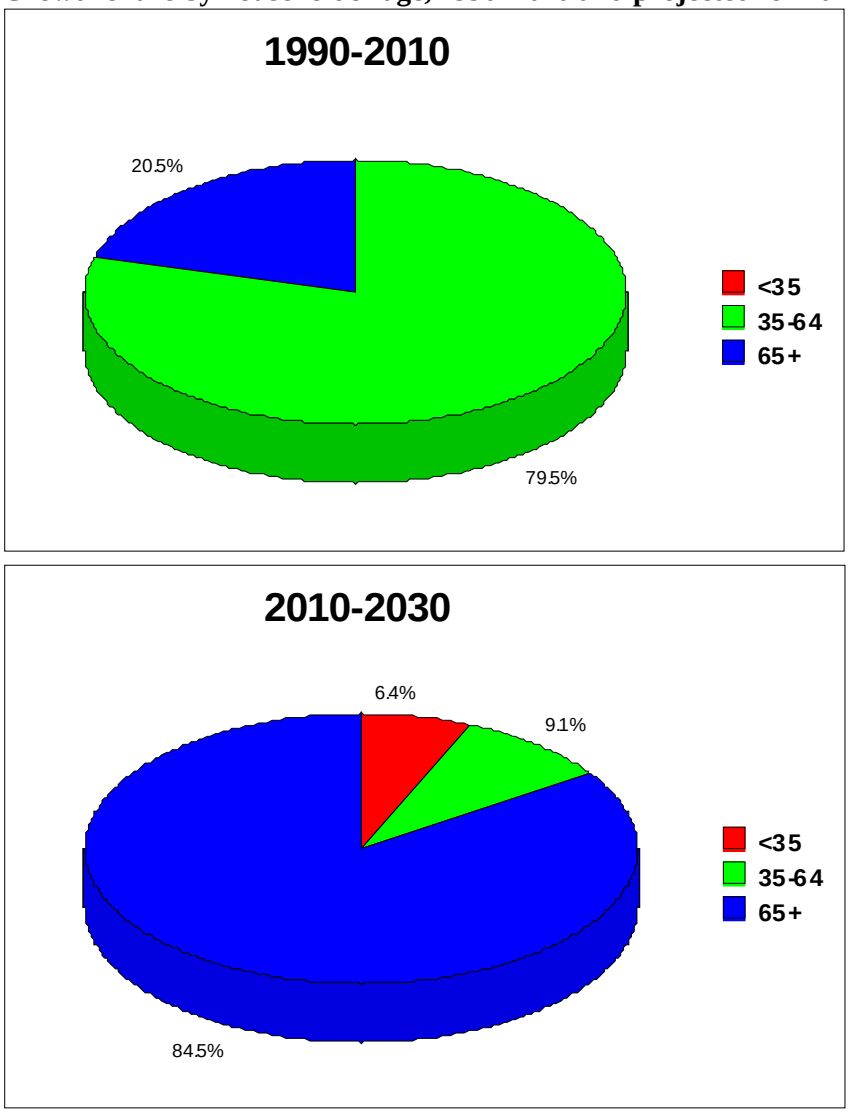
- That same peak housing demand group will grow by only 25,000 households between 2010 and 2030, about one-ninth as many as seen in the previous 20 years.

- The next wave of demand will be households with residents 65 and older. These empty-nest householders are in the downsizing phase of their life cycle. Between 2010 and 2030, their number will grow by 230,000 households.

- About half of seniors who own homes become renters after they sell. Between 2010 and 2030, there may be tens of thousands more seniors trying to sell their homes than there are buyers for them.

For the past half-century, housing demand in the Twin Cities was driven by baby boomers' parents who wanted to raise their children in suburban, single-family, detached homes on larger lots, and then by boomers themselves as they became parents. Planning throughout the Metro area continues to be based on the baby boom "time warp."

Figure B
Growth share by householder age, 1990–2010 and projected for 2010–2030



Source: Arthur C. Nelson.

The next generation of demand for homes may be driven by different and emerging preferences. Analysis of the National Association of Realtors' 2011 and 2013 stated-preference survey indicates that:

- More than half of Minnesota respondents would prefer to live in a mixed-use neighborhood offering a variety of housing choices, walkable destinations, and other features. No more than one in five households has this option now.

- About 40 percent of Minnesota respondents would choose to own or rent an apartment or townhouse if it had an easy walk to shops and restaurants and offered a shorter commute to work.

- About 60 percent of those preferring detached options would choose smaller lots over larger if, again, these were in walkable, amenity-rich neighborhoods.

- Given these parameters, this report estimates a shifting mix of housing products demand for the next 30 years:

    - 41 percent attached homes (townhouses, condominiums, and apartments);
    - 33 percent detached homes on smaller lots; and
    - 26 percent detached homes on medium- and large-lots.

- Compared to this new demand, detached homes on medium- and large-lots are presently over-supplied. The reason is the dramatic shift in demographics illustrated in Figure B. Put differently, to meet housing demand by type in 2040 all new residential units will need to be attached options (apartment, townhouse, condominium) or small-lot detached homes.

Moreover, the future of nonresidential development (in which jobs are housed) will be the redevelopment of existing structures and the parking lots on which they sit. The amount of nonresidential development may be nothing less than staggering.

- Nonresidential floor-space will grow by more than 300 million square feet between 2010 and 2040.

- Nearly 1.2 billion square feet of nonresidential space will be repurposed, redeveloped, and otherwise recycled between 2010 and 2040.

- Altogether, nearly 1.5 billion square feet will be constructed between 2010 and 2040, nearly equivalent to 1.5 times the volume of floor-space supported in 2010.

- Nearly all the nonresidential recycling will occur on sites with low floor-area ratios – sites that are mostly parking lots.

In many respects the future of the Twin Cities will be shaped by how policymakers guide the redevelopment of existing nonresidential spaces.

The built environment of the Twin Cities will be reshaped through a combination of new drivers of housing demand and recycling of existing nonresidential spaces. To accommodate emerging market needs efficiently, effectively, and equitably, a series of actions are needed at the local, regional, and state levels. In summary, they include:

- Updating land use plans and codes to get ahead of the curve, mostly by getting beyond the baby boom time warp.

- Expanding housing choices.

- Rethinking infrastructure investments.

- Using existing public sector tools and inventing new ones to leverage private redevelopment.

- Engaging and educating local decision makers and citizens on the implications of the sweeping nature of demographic changes.

- Investing in modern regional transit systems that connect key centers and other nodes along existing commercial corridors.

- Adjusting state policies to address sweeping demographic changes.

- Enabling all communities in the metro area to plan for and implement policies that broaden housing choices responsive to sweeping demographic changes.

The challenge for the Twin Cities is to create public-private-civil partnerships that can facilitate approaches to meet future housing needs and simultaneously reshape the massive commercial redevelopment that will occur. If such an effort is successful, perhaps redevelopment and new development to 2040 will support changing demographics along with other regional goals around transportation, public health, and the environment. These partnerships are needed to leverage private resources that can unlock these opportunities. If successful, the future Twin Cities will be more walkable, bikable, vital, and responsive to change than is currently the case.

INTRODUCTION

The Twin Cities Metropolitan Council serves a 3,000 square-mile region comprised of Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington counties. The Metro area's population is projected to grow from 2.85 million in 2010 to about 3.7 million by 2040. To aid local planning and decision-making processes, this report reviews market trends, emerging housing preferences, and opportunities for the redevelopment of commercial corridors and nodes to meet future development needs to 2020, 2030 and then to 2040. The report is made up of four parts.

> **Part 1** explores how sweeping demographic trends and changing home ownership influences will reshape choices to 2040. This part will show that the Twin Cities will follow national trends in becoming more diverse, somewhat older, and dominated by households without children and households that are downsizing. It will also show how the home ownership rate will fall.
>
> **Part 2** synthesizes preference survey data from the National Association of Realtors to show that, all other factors being equal, the future demand for housing will be for more attached (apartment, condominium and townhouse) and small-lot options. These emerging preferences are consistent with demographic trends. This part then projects the broad distribution of future housing needs in terms of attached, small-lot detached, and conventional-lot options.
>
> **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 in 2010, 2030, and 2040. This part also estimates the volume of work space existing in 2010 that will be replaced and/or repurposed or "recycled" to 2030 and then to 2040. As will be seen, the future of development in the Twin Cities is redevelopment.
>
> **Part 4** synthesizes analysis and findings of the first three parts to show that much of the demand for new attached residential and nonresidential development to 2040 could be largely accommodated through the redevelopment of nonresidential spaces, especially along transit-supportive commercial corridors and at nodes.

For purposes of this report, the Twin Cities metro area is comprised of Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington counties. I also differentiate between what the Census Bureau calls the "central counties" comprised of Hennepin and Ramsey (in which "central cities" of Minneapolis and St. Paul are situated). Between St. Paul and inner-ring suburban communities, Ramsey County is substantially built out. On the other hand, because of its very large size, Hennepin County includes the full range of suburban communities from inner-ring to exurban, and also agricultural areas. The balance of the Twin Cities metro area is comprised of relatively newer suburbs and exurbs as well as substantial agricultural areas.

The report includes county-level detailed tables corresponding to selected tables in text.

PART 1: DEMOGRAPHIC AND HOUSING TENURE TRENDS

This part examines two trends: **sweeping demographic changes** that will fundamentally alter the nature of housing demand in the nation, in Minnesota, and in the Twin Cities; and **changing home ownership influences** that will reduce home ownership rates. Combined, these trends will affect tenure patterns in terms of home ownership and renter rates. Addressing the challenges presented by these trends, and meeting emerging needs, will require approaches that are different from those relied on in the past.

Sweeping Demographic Changes

Demographic changes will reshape the overall population, racial and ethnic composition, senior share of population, households by type (with children, without children, and people living alone), and households by age (starter, peak housing demand, and downsizing). The section ends with some observations for the future of the Twin Cities. This section includes numerous [1]projections. I use Metro Council projections where possible. For other projections, I use the Woods & Poole projections published for 2012.

Overall Population Changes

The Twin Cities Metro area is a bright spot in the Midwest. From 2010 to 2040, Metropolitan Council forecasts that the state population will grow by 22 percent while the Metro area will grow by 29 percent. Within the Metro area, the central counties will grow by 396,000 or 24 percent and account for about 48 percent of the area's growth. The remaining five non-central counties will grow by 423,000 or 36 percent and comprise 52 percent of the area's growth. These figures are reported in Table 1.1.

The Rise of the New Majority

The U.S. Census projects that by the early 2040s, most Americans will be people of color. Minorities will become America's "New Majority." Key findings based on Table 1.2, which reports population change for white non-Latinos and New Majority Americans, include the following:

- Nationally, New Majority population will account for 91 percent of the growth between 2010 and 2040.
- Like the nation, New Majority population in Minnesota will account for 91 percent of the growth between 2010 and 2040.
- In the Metro area as a whole, the New Majority will account for 99 percent of the growth, including all of the growth in the central counties, and 77 percent of the growth in the non-central counties.

These changes, combined with others, will have profound effects on future housing markets. For one, a higher share of the New Majority population lives in multigenerational households than does the white non-Latino population. The rise of the New Majority may thus temper overall new housing demand. For another, New Majority–headed households own homes at a far lower rate than do households headed by white non-Latinos, about 41 percent in Minnesota compared with about 72 percent, respectively. By itself, the rise of the New Majority may reduce overall home ownership rates.

[1] This report does not produce projections of urbanized and rural landscapes.

Table 1.1
Twin Cities Metro Area Projections to 2020, 2030 and 2040
[Figures in thousands]

Metric	United States	Minnesota	Metro Council	Central Counties	Non-Central Counties	Rest of Minnesota
Population 2010	309,350	5,311	2,855	1,661	1,194	2,456
Population 2010-2020						
Population 2020	341,070	5,628	3,102	1,772	1,330	2,526
Population Change	31,720	317	247	111	136	70
Percent Change	10%	6%	9%	7%	11%	3%
Share of State			78%	35%	43%	22%
Share of Metro Area				45%	55%	
Population 2010-2030						
Population 2030	373,924	6,071	3,380	1,908	1,472	2,691
Population Change	64,575	760	525	247	278	235
Percent Change	21%	14%	18%	15%	23%	10%
Share of State			69%	32%	37%	31%
Share of Metro Area				47%	53%	
Population 2010-2040						
Population 2040	406,417	6,481	3,674	2,057	1,617	2,806
Population Change	97,067	1,170	820	396	423	350
Percent Change	31%	22%	29%	24%	36%	14%
Share of State			70%	34%	36%	30%
Share of Metro Area				48%	52%	

Source: Compiled from Twin Cities Metropolitan Council.

Table 1.2
Racial/Ethnic Population, 2010 to 2020, 2030 and 2040
[Figures in thousands]

Metric	United States	Minnesota	Metro Council	Central Counties	Non-Central Counties	Rest of Minnesota
Baseline						
Change, 2010-20	31,720	317	247	111	137	70
Change, 2010-30	64,575	760	525	247	278	235
Change, 2010-40	97,067	1,170	819	396	423	351
White Non-Latino						
Population 2010	201,912	4,413	2,180	1,159	1,021	2,233
Population 2020	207,535	4,445	2,210	1,152	1,058	2,236
Change 2010-20	5,623	32	30	(7)	37	2
Share of Change	18%	10%	12%	0%	27%	4%
Population 2030	210,837	4,521	2,211	1,118	1,093	2,310
Change 2010-30	8,925	108	31	(41)	72	77
Share of Change	14%	14%	6%	0%	26%	33%
Population 2040	210,932	4,517	2,187	1,067	1,120	2,330
Change 2010-2040	9,020	104	7	(92)	99	97
Share of Change	9%	9%	1%	0%	23%	28%
New Majority						
Population 2010	107,438	897	675	502	173	222
Population 2020	133,535	1,183	892	620	273	291
Change 2010-20	26,097	286	217	118	100	69
Share of Change	82%	90%	88%	100%	73%	98%
Population 2030	163,087	1,550	1,169	790	379	381
Change 2010-30	55,649	653	494	288	206	159
Share of Change	86%	86%	94%	100%	74%	68%
Population 2040	195,485	1,963	1,487	990	497	476
Change 2010-2040	88,047	1,066	812	488	324	254
Share of Change	91%	91%	99%	100%	77%	72%

Source: Compiled from Twin Cities Metropolitan Council.

The Rise of Seniors

Another key change is the aging of America's population, headlined by baby boomers (born between 1946 and 1964) that began to turn 65 in 2011 and will continue to do so until 2029. The baby boomers are the largest generation yet to enjoy the public health improvements and longer life expectancies achieved in the past century. This will drive the rapid growth of the senior citizens population.

Table 1.3 shows that for the nation, the share of population age 65+ will rise from 13 percent in 2010 to 19 percent in 2030 and then to 20 percent in 2040. For Minnesota the senior share of the population will grow from 13 percent in 2010 to 20 percent in 2030 and then to 22 percent 2040. For the Metro area as whole, seniors will increase their share of population from 11 percent in 2010 to 20 percent in 2030 to 21 percent in 2040. Shares for the central counties are 12 percent (2010), 22 percent (2030) and 23 percent (2040). Shares for non-central counties are 10 percent, 18 percent, and 19 percent, respectively. The growth rate of seniors will be higher in the non-central counties to 2040 than any other geographical unit reported in Table 1.3.

Another way to look at how the rise of seniors will reshape housing choices is to consider their share of population growth. Table 1.3 shows that for the United States as a whole, the change in population of those over 65 will be half of the overall growth to 2030, and 42 percent of the overall growth to 2040. The figures are higher for Minnesota: To 2030, seniors will comprise 69 percent of the state's growth though falling to 63 percent between 2010 and 2040.

In the Metro area, seniors will comprise 71 percent of the share of growth between 2010 and 2030, and 58 percent between 2010 and 2040. The situation will differ between the central and non-central counties. Seniors as an equivalent share of central counties' growth will be 89 percent (2010 to 2030) falling to 70 percent (2010 to 2040). For non-central counties the shares will be 56 percent (2010 to 2030) falling to 47 percent (2010 to 2040).

Household Change Dominated by Childless Households and Singles

Change from 2010 to 2040 will be unprecedented on two other fronts: the growth in the number of households without children (and especially people living alone), and the growth in the number of downsizing households. In this section I address the change in households by type: households with and without children, and people living alone.

Prior to 1970, the United States was a nation mostly of households with children. In 2000, however, only one-third of American households had children in them. By 2040, slightly more than a quarter will. This can be derived from figures reported in Table 1.4.

Even more remarkable is this: *Between 2010 and 2040, households with children will account for only 19 percent of the change in households nationally; households without children will drive 81 percent of the change*. Moreover, between 2010 and 2030, people living alone will account for more than half of all household change, falling to about 44 percent between 2010 and 2040. Indeed, nationally, the growth in one-person households will be about 2.5 times the growth of households with children to 2040.

Trends in Minnesota will follow those of the nation. Between 2010 and 2030, households with children will comprise 10 percent of the growth in households with childless households comprising the other 90 percent. The millennials generation is roughly equivalent in numbers to the baby boom generation – it is not larger. Their entry into the family-age market will substantially replace the baby boomers, but leaving the family-age market only slightly larger.

Over the period 2010-2040, these trends extend further: the growth-shares will be 18 percent (households with children), 82 percent (households without children), and 48 percent (people living alone).

Table 1.3
Senior Population 2010 to 2020, 2030 and 2040
[Figures in thousands]

Metric	United States	Minnesota	Metro Council	Central Counties	Non-Central Counties	Rest of Minnesota
Baseline						
Population 65+ 2010	40,331	684	307	192	115	378
Share of Population	13%	13%	11%	12%	10%	15%
65+, 2010-2020						
Population 2020	55,031	968	475	292	182	494
Share of Population	16%	17%	15%	17%	14%	20%
Population Change	14,700	284	168	100	67	116
Percent Change	36%	41%	55%	52%	59%	31%
Share of Net Growth	46%	89%	68%	91%	49%	100%
65+, 2010-2030						
Population 2030	72,337	1,211	681	411	270	530
Share of Population	19%	20%	20%	22%	18%	20%
Population Change	32,006	526	374	219	155	152
Percent Change	79%	77%	122%	114%	135%	40%
Share of Net Growth	50%	69%	71%	89%	56%	65%
65+, 2010-2040						
Population 2040	81,250	1,424	780	467	313	644
Share of Population	20%	22%	21%	23%	19%	23%
Population Change	40,919	740	473	275	198	267
Percent Change	101%	108%	154%	143%	173%	71%
Share of Net Growth	42%	63%	58%	70%	47%	76%

Source: Compiled from Twin Cities Metropolitan Council.

In the Metro area, from 2010 to 2030, households with children will account for 20 percent of households growth, with 80 percent of growth being households without children. People living alone will account for about 40 percent of the change, far less than the nation. Trends for central and non-central counties will be comparable in terms of share of change attributable to households with children (16 percent and 23 percent) and without (84 percent and 77 percent). They vary considerably in terms of the share of household growth attributable to people living alone (49 percent and 32 percent respectively).

Over the period 2010 to 2040, the share of growth in households with children for the Metro area as a whole will be 23 percent, somewhat higher than national trends, while households without children will account for 77 percent of the change. People living alone will comprise 38 percent of the change. Shares for the central counties are 21 percent (households with children), 79 percent (households without children) and 47 percent (people living alone) while those of non-central counties are 24 percent, 76 percent, and 31 percent respectively.

Table 1.4
Change in Households by Type, 2010-2020, 2030 and 2040
[Figures in thousands]

Metric	United States	Minnesota	Metro Council	Central Counties	Non-Central Counties	Rest of Minnesota
Baseline, 2010						
Households	116,945	2,090	1,118	679	439	972
HHs with Children	34,814	617	361	195	166	256
HHs without Children	82,131	1,473	757	484	273	717
People living alone	31,264	585	330	230	101	255
Change in Households by Type, 2010-2020						
Households 2020	130,556	2,335	1,257	739	518	1078
Household Growth	13,611	245	139	60	78	106
HHs with Children	36,657	643	390	205	185	253
HHs with Children Change	1,843	27	29	10	19	-2
HHs with Children Share	14%	11%	21%	17%	24%	0%
HHs without Children	93,899	1,691	867	534	333	825
HHs w/o Children Change	11,768	218	110	50	60	108
HHs w/o Children Share	86%	89%	79%	83%	76%	100%
People living alone	37,773	705	377	255	122	328
People living alone Change	6,509	120	47	25	21	73
People living alone Share	48%	49%	34%	42%	27%	69%
Change in Households by Type, 2010-2030						
Households 2030	143,232	2,566	1,388	798	590	1178
Household Growth	26,287	476	270	119	151	206
HHs with Children	38,358	666	414	214	201	252
HHs with Children Change	3,544	50	53	19	34	-4
HHs with Children Share	13%	11%	20%	16%	23%	0%
HHs without Children	104,874	1,899	973	584	389	926
HHs w/o Children Change	22,743	426	217	100	116	209
HHs w/o Children Share	87%	89%	80%	84%	77%	100%
People living alone	45,299	870	438	289	149	433
People living alone Growth	14,035	286	107	59	48	178
People living alone Share	53%	60%	40%	50%	32%	86%

Table 1.4--continued
Change in Households by Type, 2010-2020, 2030 and 2040 – Continued
[Figures in thousands]

Metric	United States	Minnesota	Metro Council	Central Counties	Non-Central Counties	Rest of Minnesota
Change in Households by Type, 2010-2040						
Households 2040	152,171	2,728	1,509	851	658	1218
Household Growth	35,226	638	392	172	219	246
HHs with Children	41,486	731	450	230	220	281
HHs with Children Change	6,672	115	89	36	53	28
HHs with Children Share	19%	18%	23%	21%	24%	11%
HHs without Children	110,685	1,997	1,060	621	439	937
HHs w/o Children Change	28,554	523	303	137	166	220
HHs w/o Children Share	81%	82%	77%	79%	76%	89%
People living alone	46,902	893	480	311	169	413
People living alone Growth	15,638	308	150	82	68	158
People living alone Share	44%	48%	38%	48%	31%	64%

Source: Compiled from Twin Cities Metropolitan Council (metro counties) and Woods & Poole (US and MN).

A Population Dominated by Downsizing Households

Now consider the change based on life cycle progress and demand for housing. I divide households into three broad groups:

- **Starter-home** households, with residents under 35. These householders are young people, many with young families, and are starting out in their careers; they tend to rent or buy smaller homes, townhomes, or condominiums.

- **Peak-housing-demand** households, with residents age 35 to 64. These householders are at the peak of their space demands in their 40s and at the peak of their income. Dual-income families make up about half of these households.

- **Downsizing** households, with residents 65+. For the most part these householders have finished raising their families, are retiring, and no longer wish to care for larger homes, especially on large lots and far from services, shopping, and medical assistance.

Table 1.5 shows the number of households by age category, and changes between 1990–2010, 2010–2030, and 2010–2040. For the nation, peak-housing-demand households accounted for 78 percent of all the growth in households between 1990 and 2010, followed by empty-nesting and downsizing households at 22 percent; there were actually fewer starter home households in 2010 than in 1990. Trends were similar for both Minnesota and the Metro area: The net change in demand for homes serving the needs of households during their peak space needs was 80 percent for the state and 81 percent for the Metro area, and 87 percent and 76 percent for the central and non-central counties respectively. The nation had never seen such a confluence of demand for detached homes. This was driven explosive growth in child-rearing households, with historic levels of wealth, and unprecedented opportunities to buy homes at attractive prices in new suburbs. But those days are largely over.

Trends will be very different for the period 2010 to 2030. Nationally, peak-housing-demand households will account for only 14 percent of the growth, with starter households increasing to an 11 percent share while downsizing households will dominate the market with 75 percent share of growth. While trends for the state will be comparable, they will be very different for the central and non-central counties of the Metro area, as shown in Table 1.5. Indeed, in central counties there will be no net new demand for homes meeting the needs of peak-space demand households. Nearly all (99 percent) of the net new demand in central counties will be from downsizing households (with householders over 65).

In non-central counties, about a quarter of the new demand for housing from 2010 to 2040 will be attributable to peak-space demand households (down from three-quarters during 1990-2010) while downsizing households will account for about two-thirds of the demand (up from a quarter during 1990-2010).

I will next discuss the implications of other influences on home ownership rates.

Table 1.5
Households by Age Group, 1990–2010, 2010–2030, and 2010–2040
[Figures in thousands]

Metric	United States	Minnesota	Metro Council	Central Counties	Non-Central Counties	Rest of Minnesota
Baseline						
HH Change	24,629	436	241	68	173	195
HH Change <35	(1,285)	-38	-33	-28	-5	-5
HH Change 35-64	20,457	388	220	85	135	168
HH Change 65+	5,779	91	57	13	44	35
HH <35 Share	0%	0%	0%	0%	0%	0%
HH 35-64 Share	78%	81%	80%	87%	76%	83%
HH 65+ Share	22%	19%	20%	13%	24%	17%
HH Change by Age, 2010-2020						
HH Change	13,611	245	139	60	78	106
HH Change <35	1,511	16	-5	-8	3	21
HH Change 35-64	3,116	62	46	11	35	15
HH Change 65+	8,984	167	98	57	41	69
HH <35 Share	11%	7%	0%	0%	3%	20%
HH 35-64 Share	23%	25%	32%	16%	45%	15%
HH 65+ Share	66%	68%	68%	84%	45%	65%
HH Change by Age, 2010-2030						
HH Change	26,287	476	270	119	151	206
HH Change <35	2,863	46	17	1	16	29
HH Change 35-64	3,759	41	25	-12	36	16
HH Change 65+	19,665	389	228	130	98	160
HH <35 Share	11%	10%	6%	1%	11%	14%
HH 35-64 Share	14%	9%	9%	0%	24%	8%
HH 65+ Share	75%	82%	85%	99%	65%	78%
HH Change by Age, 2010-2040						
HH Change	35,226	638	392	172	219	246
HH Change <35	5,885	111	36	9	27	75
HH Change 35-64	10,041	169	65	1	64	104
HH Change 65+	19,300	358	291	163	128	68
HH <35 Share	17%	17%	9%	5%	12%	30%
HH 35-64 Share	29%	27%	17%	1%	29%	42%
HH 65+ Share	55%	56%	74%	94%	58%	27%

Note: Figures reflect only share of net growth (negative growth is zero).
Source: Compiled from Twin Cities Metropolitan Council (metro counties).

Changing Home Ownership Influences

While home ownership may be a key symbol of the American Dream, it will probably become less attainable and perhaps even less desirable by 2040 than it has been in the past. From an economic perspective, there are four main reasons for this: rising energy costs, falling incomes, shifting wealth, and tighter home finance. The overall effect may be substantially lower home ownership rates in the future.

Rising Energy Costs

Following World War II, home ownership in the United States rose steadily, rising from 55 percent in 1950 to a peak of 69 percent in 2004.[2] One key reason was the opening of a vast supply of inexpensive land available for home building outside cities, enabled by highway-building in major metros. Another was cheap gasoline: The cost of driving to work and other destinations from a suburban home was low.

Since the early 1970s, energy prices have been rising steadily. Living far from work, shopping, and other destinations has become 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 percent per year, compounded, three to four times faster than inflation.[3]

Steadily increasing gasoline prices may dampen the attractiveness of suburban fringe and exurban areas for home buying. On the other hand, homes closer to urban areas are usually more expensive to purchase. The overall effect of rising gasoline prices may be fewer households able to both buy homes and pay for gasoline. For the nation as a whole, housing costs average about 32 percent of after-tax household income, while transportation costs account for 18 percent for total housing plus transportation (H+T) costs of 50 percent. The Twin Cities metro area is 32 percent and 17 percent respectively for total H+T costs of 49 percent.[4]

Falling Incomes

Not only are fuel costs rising, but incomes are falling in real terms. Median household incomes for all age groups in each income category were lower in the beginning of the 2010s than at the end of the 1990s.[5] Moreover, the national poverty rate increased from 11.3 percent in 2000 (Dalaker 2001) to 15.1 percent in 2010 (DeNavas-Walt et al. 2011). The rate of this increase appears greatest in the suburbs. Between 2000 and 2008, suburban areas accounted for nearly half the increase in the population in poverty (Kneebone and Garr 2010). In contrast, primary cities accounted for just over 10 percent 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). Median household incomes may rise in real terms in the future but there appears no certainty. Combined, those effects may further alter the demand for owner-occupied homes over the next several decades (McKeever 2011).

Shifting Wealth

There is another trend: The nation's wealth has been shifting steadily to more affluent households. In the 1980s, about 80 percent of the nation's wealth was held by the wealthiest fifth of America's households.

---

[2] See www.census.gov/housing/hvs/.

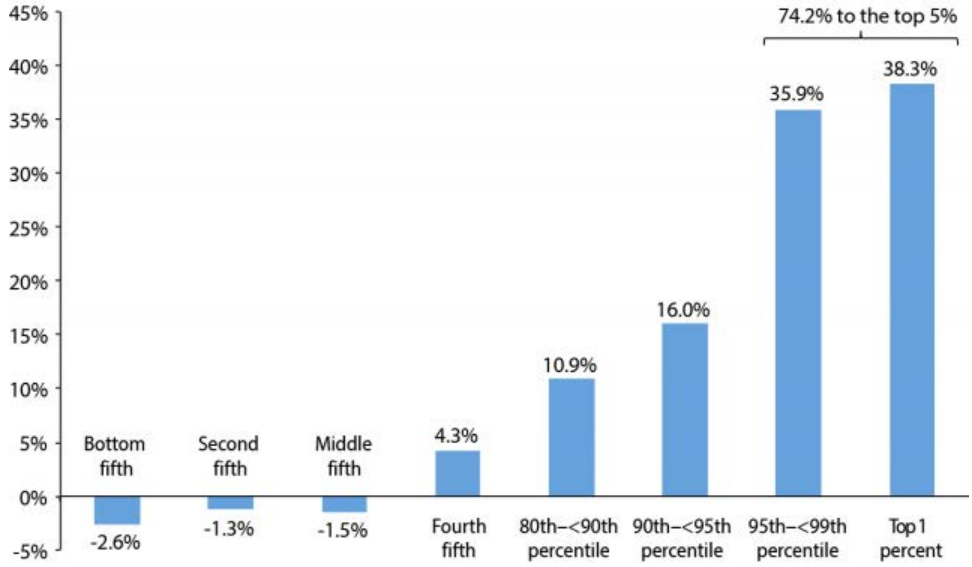
[3] The coefficient of determination (R2) is 0.70, the t-ratio is 35.86, and $p > 0.01$.

[4] Adapted from the Consumer Expenditure Survey accessed April 27, 2014 from http://www.bls.gov/cex/csxgeography.htm#national for the data.

[5] This assessment is based on analysis of median household income from 1998 through 2012 published by the Census, accessed May 11, 2014 from https://www.census.gov/hhes/www/income/data/historical/household/ for Table H-1.

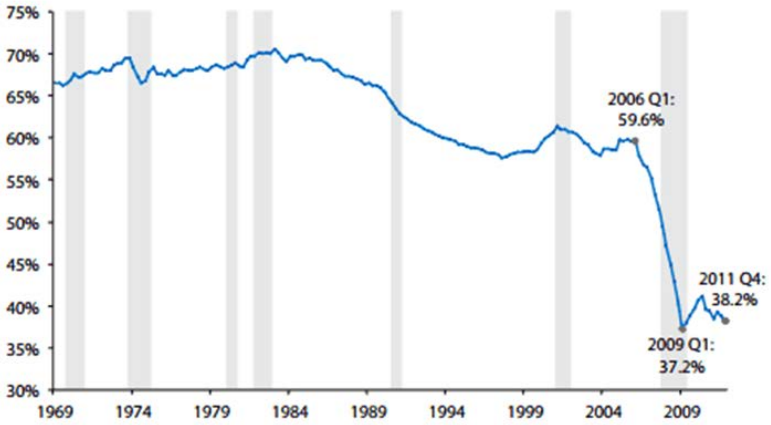
By 2010, nearly *all* of America's wealth was held by the top quintile, as illustrated in Figure 1.1. The Great Recession of 2008–09 and its aftermath can be partly blamed for reducing the wealth of the middle and lower classes. Historically, a large share of American households' wealth has been the equity in their homes. This wealth was impacted as homeowners lost one-third of their equity during the recent recession. As seen in Figure 1.2, *homeowner equity has fallen steadily from the early 1980s, from about 70 percent to about 40 percent* (Mishel et al. (2012: 397). New, highly leveraged home purchase opportunities that became widely available during the past generation have contributed to the loss of equity.

Figure 1.1
Share of wealth held by household wealth categories, 2010



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.
Source: Economic Policy Institute; Federal Reserve Board, Survey of Consumer Finances and Flow of Funds, stateofworkingamerica.org/chart/swa-wealth-figure-6b-share-total-household/.

Figure 1.2
Homeowner equity as share of home value, 1969–2011



Source: Mishel et al (2012: 397).

Shifting wealth and loss of home equity have contributed to changing market dynamics: Fewer people are able to buy homes. Because of eroded equity, those who do own homes may not be able to refinance to improve their cash flow or to assemble a downpayment on a new home. And reduced demand further reduces prices and erodes equity.

Tighter Home Financing

The rate of home ownership is largely a function of household income and the ability to make a down payment. Home ownership was pushed to its limits in the mid-2000s, reaching an all-time high of about 69 percent in 2004. Contributors included "subprime" loans with easy qualifying, "Alternative A" loans for people meeting marginal qualification standards, and "jumbo" loans for those wishing to borrow beyond the Federal Housing Administration limits. Those modes of financing are now either gone or highly restricted. Conventional home financing, reminiscent of the period from the 1960s to the middle 1990s, is now just 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 home ownership rates and increase demand for rental housing. Demographic changes will likely add to lessening home ownership rates.

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 for a loan 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 larger down payments as banks return to the traditional 20 percent down payment standard for conventional mortgages. This move among lending institutions regulated by the federal government has drawn concern from the National Association of Home Builders. [6] Its concern is that requiring higher downpayments such as 20 percent would disproportionately harm first-time home buyers

[6] See "NAHB Credit Risk Retention Letter to Joint Regulators", August 1, 2011, accessed at http://www.nahb.org/fileUpload_details.aspx?contentID=163463&fromGSA=1

who account for about 40 percent of home-buying activity. It estimates that such a change would disqualify about 5 million potential home buyers.[7]

As seen in Figure 1.3, about 60 percent of all American homeowners in 2009 put less than 20 percent down for their home.[8] Clearly, higher down payment requirements will reduce the number of households that can afford to buy a home.

Figure 1.3
Down payment as share of house purchase

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

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

Overall Home Ownership Outcomes

These emerging trends seem poised to push home ownership rates down, but by how much and by when are subject to speculation. One estimate, from the Urban Land Institute (McIlwain 2009), projects that the home ownership rate in 2020 will range between 62 percent and 64 percent, as shown in Figure 1.6.

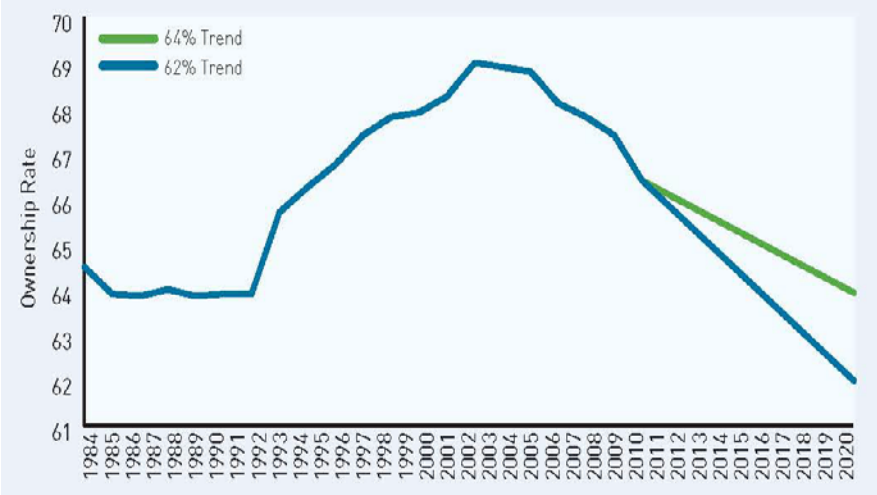
Between 1965 and 1995, the median home ownership rate was about 64 percent. This figure reflected housing demand from a society composed mostly of white non-Latino households. Between 2000 and 2010, easy credit masked the effects of a shift in demographics and the home ownership rate did not change much: Overall, the figure stood at 65 percent in 2010, and the rate among white non-Latinos was 72 percent. African-American home ownership dropped from 47 percent to 45 percent during that period, and Latino home ownership rose slightly, from 46 percent to 47 percent.[9] It is unrealistic to assume that home ownership rates will remain constant from 2010 to 2040. If the home ownership rate for each racial and ethnic group is just 5 percent lower in 2040 than in 2010—moving from 72 percent to about 68 percent for white non-Latinos, for instance—the nation's overall home ownership rate will fall to about 60 percent, the same as it was in the 1960s. Rental housing would accommodate two-thirds or more of the new housing demand, with owner housing accounting for the balance.

[7] Considering there were about 75 million homeowners in 2010, I estimate that losing 5 million would reduce the home ownership rate from above 66 percent to about 60 percent, a rate not seen since 1960.

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

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

Figure 1.6
Actual and projected home ownership rates, 1984–2020



Source: John McIlwain (2009).

Ownership trends to 2030 and 2040 are reported in Table 1.6 for the nation, Minnesota, and the Metro area. The method for estimating tenure change is as follows: The ownership rate for each major racial and ethnic group by age in 2010 is assumed to be the same for 2030 and 2040. Indeed, the 2010 rate for these groups (white non-Latino and New Majority) by age category (under 35, 35-64, and 65 or over) was about the average of the annual rates over the period 1994 through 2011. Those rates are applied to my estimate of households based on householder race/ethnicity to 2030 and 2040.

With the constant, cohort-specific tenure assumption, the national home ownership rate is projected to fall from about 65 percent in 2010 to 63 percent in 2030 and then perhaps to less than 62 percent in 2040. The figures for Minnesota are 73 percent, 70 percent and 69 percent, respectively while for the Metro area they are respectively 70 percent, 68 percent and 67 percent. There is a substantial contrast between, respectively, 2010, 2030 and 2040 ownership rates for central counties of 64 percent, 61 percent and 59 percent and those of non-central counties of 81 percent, 79 percent and 78 percent.

Though these reductions in ownership rate may seem small, they lead to important shifts in the demand for new owner and rental housing development:

- For the United States, the changing tenure rates mean that between 2010 and 2030, 48 percent of the net new demand for housing will be for rentals, and to 2040 it will be 49 percent.

- For Minnesota the figures are 43 percent and 45 percent, respectively.

- The net rental demand share figures for the Metro area are less than for the nation and the state, at 39 percent and 42 percent, respectively. The share of rental demand for central counties will be higher at 56 percent and 61 percent while figures for non-central counties will be lower at 26 percent and 27 percent, respectively.

There was a time when owning a home was seen as a low-risk way to accumulate wealth and eventually enjoy a modest retirement. This has changed. Demographic trends and the recent weak performance of home ownership as an investment are altering attitudes about owning homes, especially among younger generations. Between 2007 and 2013, America's residential real estate lost about $7 trillion in value in

2013 dollars or more than 20 percent.[10] While home ownership remains an important element of the nation's economy, there is also a new cautiousness among prospective home buyers. The National Foundation for Credit Counseling summarized results of a 2009 survey it commissioned as follows:

> *The lack of confidence in consumers' ability to buy a home, improve their current housing situation, or trust home ownership 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 home ownership have shifted.* (Cunningham 2009, 1)

The survey also found that:

- 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.

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

- Of those who still own a home, 31 percent do not think they'll ever be able to buy another one (upgrade an existing home, buy a vacation home, etc.).

Residential real estate values may rebound nationally but my impression is that the rebound will be limited to a third to perhaps half of the nation's metropolitan areas, and will be slower in the suburbs and exurbs than locations closer-in, or in/near suburban centers.

I will discuss the implications of sweeping demographic changes and changing home ownership influences next.

[10] This calculation is based on data from http://www.zillow.com/blog/value-us-homes-to-top-25-trillion-141142/.

Table 1.6
Tenure Change to 2020, 2030 and 2040
[Figures in thousands]

Metric	United States	Minnesota	Metro Council	Central Counties	Non-Central Counties
Baseline 2010					
Owner Units	76,133	1,526	775	433	342
Renter Units	40,812	564	327	246	81
Ownership Rate 2010	65%	73%	70%	64%	81%
White N-H Rate	72%	77%	76%	71%	83%
New Majority Rate	48%	41%	39%	33%	59%
Tenure 2010-2020					
Owner Units 2020	82,907	1,658	863	463	400
Renter Units 2020	47,648	677	375	276	99
Ownership Rate 2020	64%	71%	70%	63%	80%
Owner Change 2010-20	6,774	132	88	30	58
Renter Change 2010-20	6,837	113	49	30	18
Owner Share	50%	54%	64%	50%	76%
Renter Share	50%	46%	36%	50%	24%
Tenure 2010-2030					
Owner Units 2030	89,691	1,796	938	485	452
Renter Units 2030	53,540	770	432	312	119
Ownership Rate 2030	63%	70%	68%	61%	79%
Owner Change 2010-30	13,558	270	163	53	110
Renter Change 2010-30	12,728	205	105	67	39
Owner Share	52%	57%	61%	44%	74%
Renter Share	48%	43%	39%	56%	26%
Tenure 2010-2040					
Owner Units 2040	94,013	1,878	999	500	499
Renter Units 2040	58,158	850	490	351	140
Ownership Rate 2040	62%	69%	67%	59%	78%
Owner Change 2010-40	17,880	353	224	67	157
Renter Change 2010-40	17,346	285	163	105	59
Owner Share	51%	55%	58%	39%	73%
Renter Share	49%	45%	42%	61%	27%

Source: Analysis adapted from U.S. Census, Woods & Poole, and Metro Council based on tenure rates by householder age for White Non-Hispanic (White N-H in table) and New Majority householders (see text)

What Sweeping Demographic Changes and Changing Home Ownership Influences Mean

America became a "suburban nation" between 1950 and 2000. During that time, the share of Americans living in suburban areas increased from 27 percent to 52 percent. Suburbia grew by 100 million people, absorbing three-quarters of the nation's population growth.

In 1950 more than half of America's households included children; people living alone accounted for slightly more than 10 percent of all households; the average household size was 3.4 persons. By 2040 only slightly more than one-fourth of all households will have children living in them, more than one-third of all households will be people living alone, and the average household size will be at about 2.58 persons, the same as in 2010. The needs of a society dominated by childless households, a growing share of which have only one person, will be different from the needs seen in the middle of the 20th century, when households with children were in the majority.

Over the next several decades, the Metro area will grow at a pace roughly comparable to the nation. It will do so in ways very different from those of the recent past. As reported in Table 1.5, between 1990 and 2010, households in the peak-housing-demand period of their life cycle accounted for 80 percent of new housing needs. However, between 2010 and 2030, they will account for just 9 percent of new housing needs, rising to just 17 percent of new housing needs to 2040.

Changing demographics suggest a regime change in housing demand. Baby boomers will shift from larger homes, usually on larger lots, to downsized options such as smaller homes on smaller lots, townhouses, condominiums, apartments, and independent and assisted-living facilities. For the Metro area as a whole, between 2010 and 2040, 74 percent of households' growth will be the ballooning of senior citizens numbers. For the central and non-central counties those figures are 94 percent and 58 percent, respectively (see Table 1.5.).

There is more to this trend, however. *Nationally, about 82 percent of householders over 65 own their homes, the highest of any age cohort.* But in their 70s, people shift from owner to renter, with most moving into apartments as opposed to independent or assisted living facilities. Using national data from the American Housing Survey, Table 1.7 shows the propensity of people over age 70, in five-year increments, to sell and then rent.

Among households over 70, more than half of sellers become renters. The renter rate increases with age. Fewer than 80 percent 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. 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 1.7
Propensity of Senior Owners by 5-Year Age Group to Move and Rent

Householder Age	Owners Who Sell Annually	Share of Owners who Sell who Become Renters
All Householders 65+	4.5%*	45%
All Householders 70+	4.0%	52%
All Householders 75+	3.9%	60%
All Householders 80+	4.1%	68%
All Householders 85+	4.5%	79%

Note: About 82% of householders 65+ own their homes in the U.S.
* This figure is 4.8% in the Minneapolis-St. Paul Metropolitan Area according to the 2007 American Housing Survey which is the most recent available.
Source: Estimated from 2011 American Housing Survey raw data.

Older people living alone want housing options that are different from those favored by younger households with children. This will have important implications for the Metro area housing market. I have estimated the potential for senior home sellers to buy as well as to rent. I assume they will not sell their homes to each other, and that senior sellers want something different. To mitigate survey sample limitations, I use national figures for all householders 65+. That is, I assume that 4.5 percent of seniors who own will want to sell their homes any given year and that 45 percent of them will want to become renters. (The 45 percent figure was chosen as a conservative estimate because it is the lowest end of the 45 percent to79 percent range.) I further assume the local housing market will generate buyers of those homes and also that the market will generate new homes for seniors reflecting their downsizing needs.

I report 65+ seller potential and renter demand figures for the Metro area as a whole as well as central and non-central counties in Table 1.8. I report cumulative 65+ sales potential from 2010 to 2020, 2030 and 2040. That is, in any given year, 4.5 percent of 65+ owners will want to sell so I sum the annual estimates over each period. I also estimate the annual number of buyers the same way. I also estimate the annual demand for 65+ sellers to rent homes after they sell. Finally, I calculate the difference between 65+ sellers and all buyers (including 65+ sellers who then become buyers) and the number of 65+ sellers able to sell and move into a rental unit.

Findings from this analysis include:

- ***Between 2010 and 2020***, for the Metro area as a whole, there may be just about the same number of 65+ households who wish to sell their homes as there may be buyers. This assumes all home buyers will want to buy all the homes 65+ households want to sell. For central and non-central counties the situation is at the extreme. For central counties, there may be as many as 54,000 65+ households who want to sell their homes (cumulated annually from 2010 to 2020) but only 30,000 buyers. There may be about 24,000 65+ households unable to sell their homes, and about 11,000 of them who want to become renters who cannot. In contrast, cumulatively, there will be about 60,000 buyers of homes in non-central counties compared to about 37,000 65+ sellers. Assuming buyers want to buy all homes 65+ sellers want to sell, seniors in the non-central counties will be able to buy or rent homes better meeting their needs.

- The imbalance between 65+ sellers and buyers begins to broadly affect the Metro area ***between 2010 and 2030***. For the Metro area as a whole there may be potential for about 57,000 more 65+ sellers than buyers while for the central counties the difference may be as high as 76,000 with as many as 34,000 65+ households being unable to become renters. The non-central counties may

see somewhat more buyers than 65+ sellers but this again assumes all 65+ sellers are able to sell their homes to buyers, including other 65+ households.

- Senior sellers hit their peak between 2030 and 2040 – some years after the retirement boom. Thus, in the long-term, ***between 2010 and 2040,*** there may be more 65+ sellers than buyers in both central and non-central counties. Cumulatively over this 30 year period there may be 156,000 more 65+ sellers than buyers, with more than 150,000 of them in central counties. Nearly 70,000 65+ households in central counties may be unable to sell their homes to become renters. The non-central counties are also affected though to a lesser degree.

Table 1.8
Potential Excess Senior Home Sellers, 2010–2040
[Figures in thousands]

Analysis Period	Metro Region	Central Counties	Non-Central Counties
2010-2020			
Cumulative Senior Seller Demand	91	54	37
Cumulative Buyer Supply	90	30	60
Difference	(1)	(24)	23
Unmet Senior Renter Demand		(11)	
2010-2030			
Cumulative Senior Seller Demand	223	129	94
Cumulative Buyer Supply	166	53	113
Difference	(57)	(76)	19
Unmet Senior Renter Demand		(34)	
2010-2040			
Cumulative Senior Seller Demand	385	218	167
Cumulative Buyer Supply	229	67	162
Difference	(156)	(151)	(5)
Unmet Senior Renter Demand	(70)	(68)	(2)

Source: Arthur C. Nelson.

By 2040, for the Metro area as a whole, and mostly in the central counties, even if all the growth of under-65 home owners bought seniors' homes, about 156,000 65+ households still may not be able to sell their homes to downsize. Their choices would seem to include:

- staying in their home longer than they expected;
- renting out their home instead of selling, and then incurring management responsibilities and expenses;
- converting part of their home into an accessory dwelling unit for either a caregiver or a renter, thus allowing the senior to remain in his or her home;
- selling their home at a deep discount to a real estate investment group that buys such homes for rental purposes; or
- walking away from their home.

Past behavior is, understandably, a significant influence on public policy. However, in many respects, future housing needs and desires are going to be dramatically different from the past 50 years. We will

doubtlessly see creative solutions to the mismatch in the supply and demand for existing housing stock that we cannot anticipate now, but policies that encourage such creative thinking and direct new housing to address the mismatch will be most effective.

These changes will not appear instantly. In the near-term, 2020, demand for more homes on larger lots may still seem robust. The overall demand for such lots will increase by about 25,000 between 2010 and 2030—nearly 1,000 units annually. But demographic changes will occur subtly year over year. These shifts will become widely apparent well before 2030 as boomers begin trying to sell their larger homes, many on larger lots, to a shrinking pool of buyers. Housing prices would seem poised to fall as the supply of such homes exceeds demand. Homes will sell, of course, but perhaps at lower prices than hoped, and many thousands of owner-occupied homes will become rentals.

I turn next to estimating the number of households and change in households based on their income levels.

Changes in Households based on their Income relative to Area Median Income

In this section, I estimate the number of households and change in households earning less than 30 percent of the area median income (based on the Metro Council jurisdiction), between 30 and 60 percent, between 60 and 80 percent, and more than 80 percent for 2010 to 2040. These projections come from the Metro Council staff. There are interesting trends. Results are reported in Table 1.9.

> In 2010, central counties have a far higher share of households earning less than 80 percent of the area median income (AMI) than non-central counties. One reason is central counties are gateways to the rest of the metropolitan area for immigrants, and are attractive to households needing access to lower-skill jobs which are more abundant there than non-central counties.
>
> Between 2010 and 2040, central counties' share of the Metro area's lower income households will increase. During this period, central counties will account for nearly 60 percent of the growth in households earning less than 80 percent of the AMI. Considering these counties will dominate the region in growth among seniors, the large share of the change may be attributable to the rise of retired, fixed-income senior households.
>
> Non-central counties will account for 56 percent of total household growth and more than 70 percent of the households earning more than 80 percent of AMI. Yet, growth in lower income households between 2010 and 2040 will not be trivial. Non-central counties' share of households earning less than 80 percent of AMI will increase from 33 percent in 2010 to 36 percent in 2040. Overall, these counties will account for more than 40 percent in the change of such lower income households.

In Part 2, I review recent stated-preference surveys and their implications for estimating future housing demand for the Metro area.

Table 1.9
Share of Households by Income Category Relative to Metro area Median Income, 2010 to 2040
[Figures in thousands]

Area	Total	0-30%	30-60%	60-80%	<80%	80+%
Baseline 2010						
Metro Area	1,117	187	182	133	502	615
Central Counties	679	133	121	83	336	342
Share	*61%*	*71%*	*67%*	*62%*	*67%*	*56%*
Non-Central Counties	439	55	61	50	165	273
Share	*39%*	*29%*	*33%*	*38%*	*33%*	*44%*
Planning Year 2040						
Metro Area	1,509	233	267	220	720	789
Central Counties	852	160	172	130	462	390
Share	*56%*	*69%*	*64%*	*59%*	*64%*	*49%*
Non-Central Counties	657	72	95	90	257	400
Share	*44%*	*31%*	*36%*	*41%*	*36%*	*51%*
Change 2010-2040						
Metro Area	392	46	85	87	218	174
Central Counties	174	28	51	47	126	48
Share of Change	*44%*	*61%*	*60%*	*54%*	*58%*	*27%*
Non-Central Counties	218	18	34	40	92	126
Share of Change	*56%*	*39%*	*40%*	*46%*	*42%*	*73%*

Source: Compiled from Twin Cities Metropolitan Council data.

PART 2: MARKET PREFERENCES WITH DEMAND TO 2040

Major corporations, political campaigns, and development interests use *stated preference* or *forced-choice* surveys to help them understand what people want and how they can best meet those desires. These surveys are more sophisticated than a simple preference survey. For instance, a simple preference survey might ask whether someone would prefer to be a billionaire or a member of the middle class; one would expect nearly 100 percent of the respondents to choose to be a billionaire. The stated preference or forced-choice survey poses tradeoffs, for instance, whether being a billionaire for just one day (with death somehow certain afterward) would be preferable to being a member of the middle class for several decades; this forces respondents to consider a wider range of their own values. Certainly fewer than 100 percent would choose being a billionaire for a day over being a member of the middle class for the rest of their lives.

So when newspapers report surveys saying that a very large percentage of people would prefer to own homes or live in spacious houses on large lots or have granite kitchen countertops with top-of-the-line appliances, we should question whether respondents were simply endorsing obvious, tradeoff-free benefits or actually considering the pluses and minuses of various options. Could they afford those options? Would they be giving up other options, such as a home that would have a better chance of retaining its value over time even if it had fewer attributes? The National Association of Realtors (NAR) fielded a *stated preference* survey in 2011 and again in 2013.

In this part, I analyze the NAR survey to get a sense of what Minnesotans want for their neighborhoods, communities, and homes. Because the 2011 and 2013 surveys were large (2,071 and 1,500 respondents across the nation, respectively), I can use respondents from Minnesota to get a general sense of Minnesotan's preferences based on a key indicator. Unfortunately, the surveys are not large enough to generate a statistically reliable subsample representing the Metro area. However, I assume the subsample for Minnesota reasonably represents the Metro area.

U.S. and Minnesota respondents are similar in most respects. I thus use the full set of 2013 NAR survey responses for the nation to estimate demand for broad housing preferences for attached units, small-lot detached homes, and conventional-lot detached homes by major household type (households with and without children, and people living alone). I can then compare overall demand with current supply.

National Association of Realtors Stated Preference Survey

According to the NAR 2013 survey, 76 percent of respondents would prefer to live in a single-family detached home right now, if they had the option, with 52 percent wanting a large lot, and 24 percent wanting a small lot (American Strategies 2013). Yet when forced to consider the combined bundle of neighborhood and housing attributes, people's decisions shift. Although nearly everyone wants to live in a single-family detached home, the NAR survey found that nearly 60 percent also wanted access to transit and walkable access to schools. Also nearly half wanted a neighborhood with a mix of housing opportunities. These are features usually associated with smaller lots and attached options.

A key element of the NAR survey was having respondents weigh the attributes of two prototype communities. For instance, both the 2011 and 2013 surveys asked the following question with percentage responses for the nation and Minnesota. Respondents were also told that both communities were identical in every other way, leaving the respondent to assume crime, school quality, and other characteristics were the same between them. Those community options and responses were:[11]

[11] Percentages exclude non-respondents.

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.*

U.S.	=	*47 percent*
Minnesota	=	*46 percent*

***Community B** – There is 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.*

U.S.	=	*53 percent*
Minnesota	=	*54 percent*

Responses are similar for the nation and Minnesota, with 53 percent and 54 percent, respectively, favoring Community B. Though the survey did not attach labels to them, Community B is the walkable, amenity-rich, "smart growth" option. A majority of Minnesotans would seem to want walkable, amenity-rich neighborhoods. Analysis of both American Housing Survey data and Metropolitan Council housing stock data reveals that less than a fifth of them presently have this option today.[12]

Given the similarity in preferences between the national and Minnesota respondents, I assume that Minnesotan's responses in other respects will also be similar. Accordingly, Table 2.1 reports preferences for attached residential options if certain features are present and for small- and large-lots (as defined by the respondent) with respect to driving or walking to places and commuting to work.

Americans clearly prefer single-family detached homes over attached homes. Generally, 35 percent of households with children, 39 percent of multi-person households without children and 49 percent of people living alone prefer attached housing options (which include apartments, townhouses, condominiums, and multiplex units) if they had an easy walk to shops and restaurants and have a shorter commute to work. The remaining 51 to 65 percent would choose the detached home.

In choosing between small-lot and larger-lot single family detached products, nearly 60 percent of Americans would choose the small lot option if it included as easy to walk to schools, stores and restaurants, and a shorter commute to work (as defined by the respondent). There is remarkable

[12] This is based on analysis of the most recent *American Housing Survey* publications for the Minneapolis-St. Paul MSA for 2007. (See http://www2.census.gov/library/publications/2009/demo/h170-07-9.pdf.) It is calculated as the percent of total housing stock that is not within 300 feet of a single family detached home, which was 17 percent. For its part, Metro Council staff consider "walkable, urban neighborhoods" as those Census units with urban intersection density, medium or high net housing density, and medium or high land use diversity. Using these criteria, Met Council staff find 15 percent of all block groups, containing 15 percent of existing housing, are "walkable, urban neighborhoods."

consistency across household types as well, ranging from 56 percent to 62 percent. To estimate the share of households preferring detached homes on large and small lots, I need to account for differences in choice motivations. For instance, many households will choose a home based mostly on neighborhood features such as schools, parks, and proximity to shopping. For some households, the distance to work is secondary. There is not literature weighting the housing location tradeoff between neighborhood features and job accessibility. To estimate this, I weight survey responses by three-quarters for walking or driving to places (schools, stores and restaurants) and one quarter for commute distance (see Boustan and Margo 2009). The result is a more refined estimate overall preference for homes on small or large lots based on certain features. The weighted estimates are in the italicized portion of Table 2.1.

"Small" lot is not defined in most national surveys because what is considered "small" in some places may be considered "large" elsewhere. Consistent with Metro Council analysis, I assume small lots in the Metro area to be those of one-quarter acre in size or less.

Table 2.1
Lot Size and House Type Preferences under different Choice Options

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	**All House-holds**	**House-holds with Children**	**Multi-Person HHs without Children**	**People living alone**
Own or rent an apartment or townhouse, and have an easy walk to shops and restaurants and have a shorter commute to work. *OR*	40%	35%	39%	49%
Own or rent a detached, single-family house, and have to drive to shops and restaurants and have a longer commute to work.	60%	65%	61%	51%
Houses with large yards and you have to drive to get to schools, stores and restaurants. *OR*	42%	44%	44%	42%
Houses with small yards and it is easy to walk to schools, stores and restaurants	58%	56%	56%	58%
Houses with larger yards and you would have a longer commute to work. *OR*	39%	44%	44%	38%
Houses with smaller yards and you would have a shorter commute to work.	61%	56%	56%	62%
Large yard weighted 75% drive to places + 25% commute to work.	*42%*	*44%*	*44%*	*41%*
Small yard weighted 75% drive to places + 25% commute to work.	*58%*	*56%*	*56%*	*59%*

Source: Adapted from NAR (2013). Italicized analysis is derived from survey data (see text for explanation).

Demand for Housing by Type to 2040

The NAR survey can be used to create a typology of demand for residential units by type of unit for the Metro area. I estimate this as follows. I start first with the stated preference for attached homes by household type. The remaining demand will be for small-lot and all other lot detached homes which are apportioned using the italicized figures in Table 2.1. Table 2.2 shows these distributions to 2040. It also shows the net change in units by major housing unit type and the share of change they represent between 2010 and 2040.

Table 2.2
Stated Preference Shares for Major Housing Unit Types by Major Household Types

Household Type	Attached	Small Lot	All Other Lot
Households with Children	35%	36%	29%
Multi-Person Households Without Children	39%	34%	27%
People living alone	49%	30%	21%

Source: Arthur C. Nelson.

In Table 2.3, I compare estimated preferences for 2010 and 2040 with Metropolitan Council estimates of 2010 housing stock. The table shows and Figure 2.1 illustrates that the estimated 2010 supply of detached homes on medium- and large-lots nearly equals preferences to 2040. The demand for attached units will account for 47 percent of the overall change in housing demand while 53 percent of the new unit demand will be for small lots. However, this does not necessarily mean there is no need for new homes on larger lots. Many existing homes on larger lots will be destroyed by fire or natural hazard; the land on which others sit may be redeveloped; and there will always be niche markets for homes on these lots.

The bottom line is that that sweeping demographic changes reported in Part 1 will require more housing choices throughout the Metro area, with future demand favoring attached and small lot options.

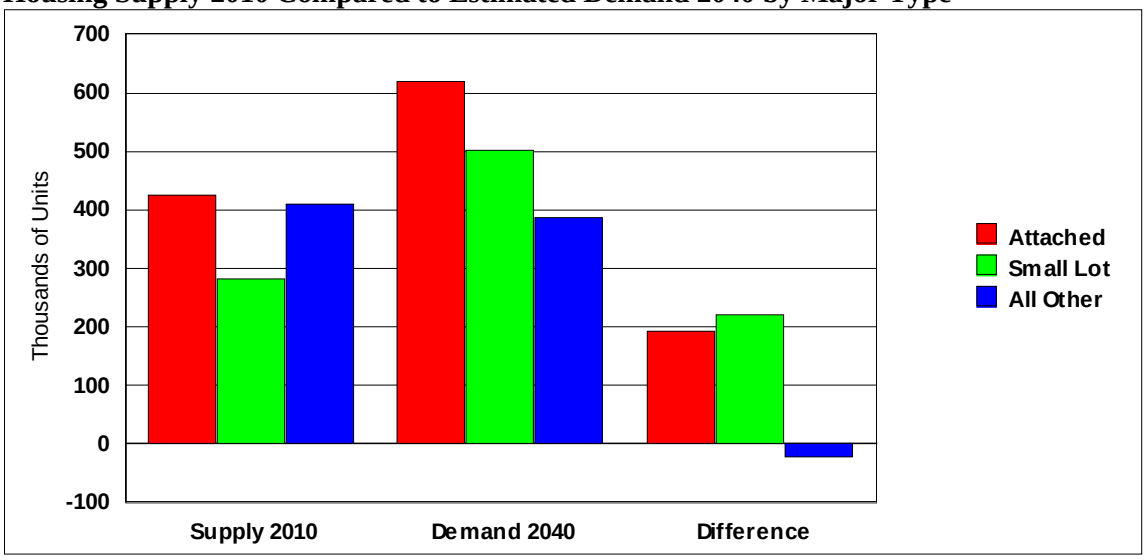
In Part 3, I will discuss nonresidential development trends.

Table 2.3
Distribution of Major Housing Unit Types by Major Household Types to 2040
[Figures in thousands]

Household Type	Households	Attached	Small Lot	All Other
2010 Occupied Housing Supply				
Total	1,118	426	281	410
Share		38%	25%	37%
2010 Households and Demand				
Households with Children	361	126	130	105
Multi-Person Households Without Children	427	166	145	115
People living alone	330	162	99	69
Total	1,118	455	374	289
Share of demand		41%	33%	26%
Surplus (Deficit) Supply and Demand		(29)	(93)	121
2040 Households and Demand				
Households with Children	450	157	162	130
Multi Person Households Without Children	580	226	197	156
People living alone	480	235	144	101
Total	1,510	619	503	388
Share of demand		41%	33%	26%
Change in Supply Needed	392	193	222	(22)
Share of Change		47%	53%	0%

Source: Arthur C. Nelson.

Figure 2.2
Housing Supply 2010 Compared to Estimated Demand 2040 by Major Type



Source: Arthur C. Nelson.

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 growth of space-consuming employment. Third, it estimates the space supported by workers in 2010 and projects space needs to 2020, 2030 and 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. 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 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 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/lodging/food, and institutional. For the most part, local planning and zoning includes a wide range of uses within each of these four nonresidential categories. In the office group, for instance, local zoning codes usually do not differentiate between such activities as real estate and technical services, but they would restrict industrial and some institutional activities. The Appendix reports in detail how I group space-occupying employment into the four abovementioned groups for analysis.

The job estimates use Bureau of Economic Analysis definitions. That is, they include all part- and full-time jobs including multiple jobs held by the same person, jobs held by self-employed persons, and other jobs that are not otherwise included wage and salary employment statistics. Generally, there are about a fifth more BEA-defined jobs than wage and salary employment.

Space-Occupying Employment Projections

Since the 1980s, no federal agency has projected employment over the long term, and few commercial services do. Fortunately, the Metro Council has generated needed projections. Table 3.1 reports employment for the major land use categories for the Metro area as well as the central and non-central counties.[13] These projections are recast into the BEA definitions and were generated by the Metro Council for this report. Employment figures reported elsewhere by Metropolitan Council are based on the narrower BLS concept of wage and salary employment.

The Metro area will see substantial expansion of jobs to 2040. For the area as a whole, I estimate more than 710,000 new jobs will be created with about 560,000 in the central counties and the remaining 150,000 in the non-central counties.

[13] The Metro Council assembles jobs by NAICS sector for its purposes differently from mine. My principal purpose is to estimate the volume of building area to be built and recycled. This provides planners and decision-makers with a general sense of the opportunity to reshape metropolitan areas through the redevelopment of existing space and the vacant land or parking lots in which they sit. I thus combine these NAICS sectors into the following land use categories: Industrial = NAICS 22, 31-33, 42; 48-49; Office = NAICS 23, 51-56, 71, 721, 81 (excluding 814), 92; Retail = NAICS 44-45, 722; and Institutional = NAICS 61, 62.

Table 3.1
Metro area Space-Occupying Employment, 2010–2040
[Figures in thousands]

Time Period, Sector & Area	2010	Forecast Year	Change	Percent Change	Change Share
2010-2020					
Metro Council					
Industrial	321	374	53	16%	16%
Office/Services	937	1,110	173	18%	53%
Retail/Lodging/Food	308	336	29	9%	9%
Institutional	345	419	74	21%	22%
Total	1,911	2,239	328	17%	
Central Counties					
Industrial	215	250	35	16%	14%
Office/Services	776	919	143	18%	57%
Retail/Lodging/Food	209	228	19	9%	8%
Institutional	259	314	55	21%	22%
Total	1,459	1,712	253	17%	
Non-Central Counties					
Industrial	106	124	17	16%	23%
Office/Services	161	190	30	18%	40%
Retail/Lodging/Food	99	108	9	9%	12%
Institutional	86	104	18	21%	25%
Total	452	527	75	17%	
2010-2030					
Metro Council					
Industrial	321	379	58	18%	11%
Office/Services	937	1,238	301	32%	59%
Retail/Lodging/Food	308	336	28	9%	6%
Institutional	345	469	124	36%	24%
Total	1,911	2,422	512	27%	
Central Counties					
Industrial	215	254	39	18%	10%
Office/Services	776	1,025	249	32%	62%
Retail/Lodging/Food	209	228	19	9%	5%
Institutional	259	352	93	36%	23%
Total	1,459	1,859	401	27%	
Non-Central Counties					
Industrial	106	125	19	18%	17%
Office/Services	161	212	52	32%	47%
Retail/Lodging/Food	99	108	9	9%	8%
Institutional	86	117	31	36%	28%
Total	452	563	111	25%	

Table 3.1
Metro area Space-Occupying Employment, 2010–2040 – Continued
[Figures in thousands]

Time Period, Sector & Area	2010	Forecast Year	Change	Percent Change	Change Share
2010-2040					
Metro Council					
Industrial	321	367	46	14%	6%
Office/Services	937	1,367	430	46%	60%
Retail/Lodging/Food	308	348	41	13%	6%
Institutional	345	543	198	57%	28%
Total	1,911	2,625	714	37%	
Central Counties					
Industrial	215	246	31	14%	5%
Office/Services	776	1,132	356	46%	63%
Retail/Lodging/Food	209	236	28	13%	5%
Institutional	259	407	148	57%	26%
Total	1,459	2,022	563	39%	
Non-Central Counties					
Industrial	106	121	15	14%	10%
Office/Services	161	234	74	46%	49%
Retail/Lodging/Food	99	112	13	13%	9%
Institutional	86	135	49	57%	33%
Total	452	603	151	33%	

Source: Employment forecast adapted from Metro Council.

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. In most urbanized areas, nonresidential space accounts for one-third or more of the built environment (excluding rights-of-way and other public spaces), and half of the taxable value.

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 "hotelling," a practice wherein workers have no full-time work area but use space when needed, according to the task.

It is uncertain whether these factors will result in less space needed in the future. For example, working at home involves a very small share of workers despite its growing prevalence. In 1990, people working at home made up 3 percent of the workforce; in 2000 it was just 3.3 percent. Moreover, 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. Internet retailing is growing but may plateau because people tend to prefer the tactile and social aspects of shopping.

In fact, a decade of advances in telecommuting, office use, and retailing technologies has not reduced overall nonresidential space needs. In fact, the trend seems to be an increase in square feet per person. Total nonindustrial space in the United States averaged 233 square feet per person (based on total population) in 1992 and 246 square feet per person in 2003.[14]

While the nonresidential space needs per capita may be increasing over time, the actual need per worker has not changed much (see Nelson 2004). There seems to be a debate on how small office worker stations will become, principally because of electronic file keeping 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, I do not see much reduction in office space per worker, though we assume it may go down to some degree, as discussed next.

To estimate space needs per worker, 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) 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. These figures include vacant space and other space used for ancillary purposes such as building lobbies, restrooms, staircases, exercise rooms, day care facilities, and so forth. I adapt and apply these figures to the Metro Council's employment projections for each major category.

The Future Is Redevelopment

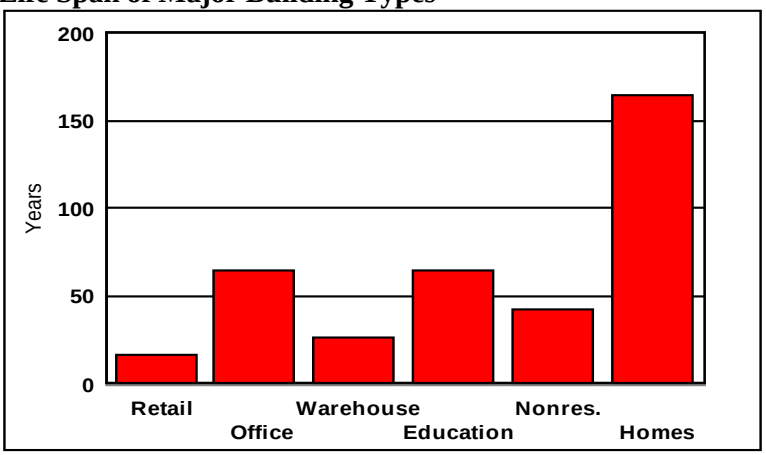
There is another consideration: Nonresidential space is not as durable as residential space. My research indicates that on average a residential unit built after 1940 may last about 170 years. That is, during any given year about 0.58 percent of the nation's housing stock disappears (see Nelson 2013). In contrast, in any given year about 2.0 percent to 2.5 percent of the nation's nonresidential stock disappears, indicating an average life span of 40 to 50 years as illustrated in Figure 3.1. (The concept of life span differs from depreciation; a building may be fully depreciated for tax and/or accounting purposes but remain used while life span means the structure is removed after a certain number of years.) Of course not all buildings disappear during this time period; high-rise towers, institutional structures, historically significant buildings and others will last hundreds of years. On the other hand, other structures last only 10 to 20 years. Over time, nonresidential spaces will need to be recycled through demolition, rebuilding, or renovations that renew structures for kinds of uses different from those for which they were 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 (adapted from Marshall & Swift 2010). 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 original purpose through the life of the building. The reason is that as the structure depreciates, land value

[14] 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. Unfortunately, the DoE contractor for the 2007 survey did not produce statistically reliable information. The next survey, for 2012, will become available later in 2014.

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.

Figure 3.1
Life Span of Major Building Types

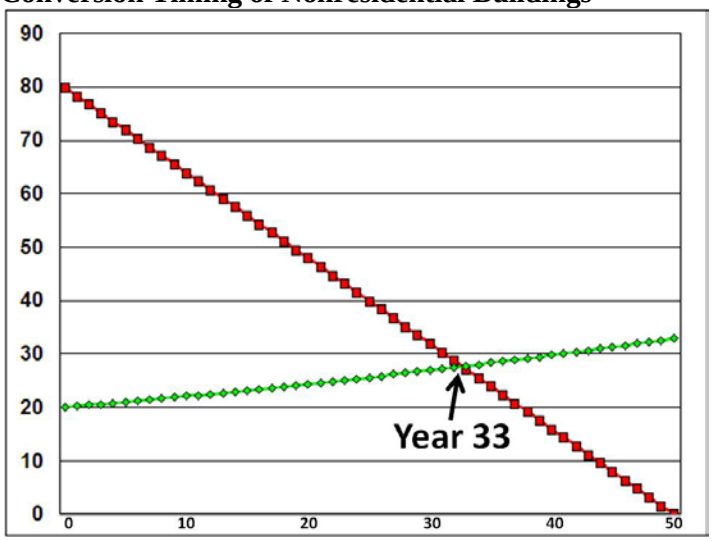


Source: Arthur C. Nelson based on Commercial Buildings Energy Consumption Survey (2006).

Consider how the recycling 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 percent of the total property value is in the structure itself and 20 percent is in the land. Suppose also that the annual appreciation of land (after inflation) is 1 percent, which is a rough average. A 50-year structure depreciating at 2 percent annually with land appreciating at 1 percent annually (compounded) 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 typical property owner begins to consider recycling: demolishing and building a new structure, or renovating the existing structure (perhaps adding to it) to serve a higher and better use. However, the actual moment of recycling is often deferred until market forces justify the cost of demolition and reinvestment. Thus, assuming all nonresidential stock is built for a 50-year useful life, *the equivalent of the entire nonresidential stock in the United States recycles about every 40 years* (Nelson 2013).

For this analysis, I assume that the average life span of all nonresidential structures will be as shown 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 on the basis of land value appreciation. In addition, I start the depreciation "clock" in 2010; that is, I 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. Land value growth is largely a function of location combined with metropolitan area growth. To account for this, 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 percent. Suppose further that the structure being depreciated has a depreciable life of 50 years. I therefore adjust the effective rate from 50 years to 40 years.

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 3.2 reports the net change to the inventory of all nonresidential groups; the estimated volume of space to be recycled; and the total space that is estimated to be built, rebuilt, or renovated for the Metro area and the central and non-central counties for the period 2010 to 2020, 2030 and then to 2040.

Table 3.4
Metro Council, Central and Non-Central Counties Nonresidential Space Development 2010–2040
[Figures in millions]

Time Period, Development and Area	2010	Forecast Year	Change	Percent Change	Change Share
2010-2020					
Metro Council					
Square Feet Supported	997	1,159	162	16%	38%
Square Feet Recycled			265		62%
Total New Construction			427		
New Construction as Share of Square Feet Supported 2010					43%
Central Counties					
Square Feet Supported	723	842	119	16%	40%
Square Feet Recycled			175		60%
Total New Construction			294		
New Construction as Share of Square Feet Supported 2010					41%
Non-Central Counties					
Square Feet Supported	274	317	43	16%	32%
Square Feet Recycled			90		68%
Total New Construction			133		
New Construction as Share of Square Feet Supported 2010					48%

Table 3.4
Metro Council, Central and Non-Central Counties Nonresidential Space Development 2010–2040 – Continued
[Figures in millions]

Time Period, Development and Area	2010	Forecast Year	Change	Percent Change	Change Share
Metro Council					
Square Feet Supported	997	1,227	230	23%	26%
Square Feet Recycled			651		74%
Total New Construction			880		
New Construction as Share of Square Feet Supported 2010					88%
Central Counties					
Square Feet Supported	723	895	172	24%	30%
Square Feet Recycled			397		70%
Total New Construction			569		
New Construction as Share of Square Feet Supported 2010					79%
Non-Central Counties					
Square Feet Supported	274	332	58	21%	19%
Square Feet Recycled			254		81%
Total New Construction			312		
New Construction as Share of Square Feet Supported 2010					114%
2010-2040					
Metro Council					
Square Feet Supported	997	1,303	306	31%	21%
Square Feet Recycled			1,164		79%
Total New Construction			1,471		
New Construction as Share of Square Feet Supported 2010					147%
Central Counties					
Square Feet Supported	723	955	232	32%	26%
Square Feet Recycled			659		74%
Total New Construction			891		
New Construction as Share of Square Feet Supported 2010					123%
Non-Central Counties					
Square Feet Supported	274	348	74	27%	13%
Square Feet Recycled			506		87%
Total New Construction			580		
New Construction as Share of Square Feet Supported 2010					212%

Source: Arthur C. Nelson.

The amount of development and especially redevelopment of nonresidential space in the Metro area will be continuous and substantial.

- The inventory of nonresidential space will grow by more than 300 million square feet between 2010 and 2040. Of this, about 230 million square feet will be in the central counties and more than 74 million will be in the non-central counties.

- Nearly 1.2 billion square feet of space will be recycled from 2010 to 2040 with some coming from the recycling of space built after 2010. Of this, about 660 million square feet will be in the central counties and more than 500 million square feet will be in the non-central counties, where the greatest percentage rate of value appreciation may occur as development advances outward.

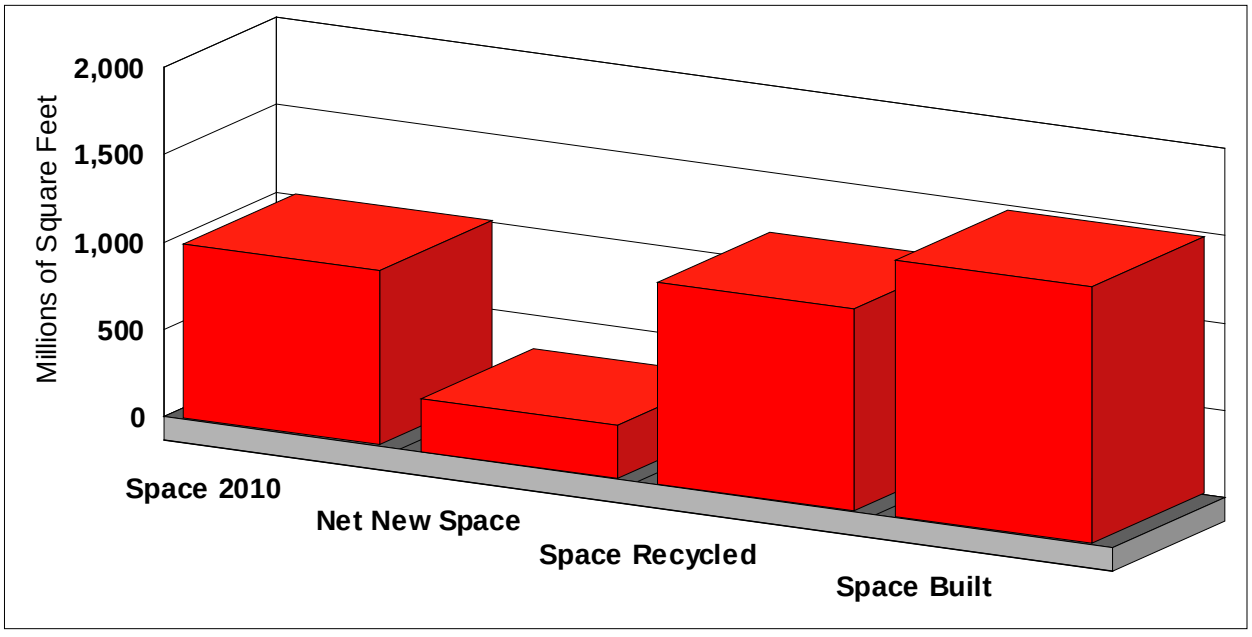
- Combining the line items above, nearly 1.5 billion square feet of nonresidential space will be built or recycled between 2010 and 2040 throughout the Metro area of which nearly 900 million will be in the central counties and the remaining nearly 600 million occurring in the non-central counties. The overall trend for the Metro area is illustrated in Figure 3.3.

- For the Metro area as a whole, the volume of nonresidential construction between 2010 and 2040 will be 1.5 times the amount of space that was supported in 2010. The figures for the central and non-central counties are 1.2 times and 2.1 times, respectively. The ratio in the non-central counties is so large because the 2010 base on structures is relatively small.

In many respects the future of the Metro area will be shaped by how it guides the redevelopment of existing nonresidential spaces. Indeed, there is another consideration: if the redevelopment of aging nonresidential stock does not occur roughly concurrent with the opportunity to do so, adjacent and nearby property may lose value with the long-term potential for blight to emerge (Nelson 2014).

In Part 4, I outline a strategy to leverage the opportunity to redevelop commercial corridors to meet the emerging demand for walkable neighborhoods, mixed residential and mixed-use development, and transit accessibility. The role of redevelopment is the key to taking advantage of emerging opportunities.

Figure 3.3
Space Supported 2010, Net Additions to Inventory Needed Between 2010 and 2040, Space Recycled by 2040, and Total Construction Needed 2010–2040



PART 4: A STRATEGY TO MEET EMERGING MARKET DEMAND

Market trends (Part 1) and stated-preference surveys (Part 2) allow us to conservatively estimate the built space demands for communities of the future. I estimate that at least one-third of households in 2030 will want the option to live in walkable neighborhoods 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, streetcars, and light rail. Analysis of preference surveys in Part 2 showed that:

- More than half of Minnesotans prefer to live in walkable, amenity-rich neighborhoods. Metropolitan Council estimates that no more than one in five live in such neighborhoods now.

- About 41 percent of Metro area households will want the option to live in attached housing units.

- Also by 2040, about 33 percent of Metro area households will want the option to live in homes on small lots but only a quarter have this option now.

- In contrast, 37 percent of all occupied homes in the Metro area sit on medium-sized and larger lots which is sufficient to meet the demand for such lots by 2040.

In Part 3, I showed that the equivalent of more than all nonresidential space existing in 2010 will become a candidate for redevelopment by 2040. Many spaces built between now and 2040 will be included in this churn. I further estimate that half of these are one-floor structures and another one-quarter are two-floor structures.[15] 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 500,000 square feet has an FAR of 0.20. For the Metro area, Metro Council staff estimate that about 38,000 acres of existing commercial and industrial land – half of the land in such use – has an FAR of less than 0.20, which means 80 percent of the land area is unbuilt or used for parking, loading, storage, and other nonstructural purposes.[16] The sheer volume of nonresidential space to be recycled and the land it sits on that can substantially reshape the Metro area. My reasoning follows.

The Redevelopment Opportunity

Research indicates 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 allow for more efficient shared-use of parking spaces for different activities, or tuck-under parking options that avoid the need to build parking structures (see Dunham-Jones and Williamson 2009; Williamson 2013). FAR above 1.0 can be achieved where there are reasonable transit options such as light rail, bus rapid transit, and streetcar. One of the key design opportunities possible in achieving FARs of more than 0.50 is mixed uses, which can reduce vehicle trips. At FARs above 1.0, mixed uses can generate one-quarter to one-third fewer trips (see Ewing and Cervero 2010). For an in-depth review of planning FARs appropriate for different transit options and development policies, I recommend a report prepared by Reconnecting America for Tampa, Florida.[17]

---

[15] Estimated on the basis of the *Commercial Buildings Energy Consumption Survey*, www.eia.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/detailed_tables_2003.html.

[16] Unfortunately, there is no detail on precisely how the 80 percent of land area is used.. While most of it is likely used for parking, ingress/egress, and loading/unloading, data do now indicate the extent to which there may be other uses such as natural cover, drainage, sensitive lands, or stormwater management, Nonetheless, it is my experience that along built-out urban/suburban corridors centers these alternative uses are negligible,

[17] See http://www.reconnectingamerica.org/assets/Uploads/20090729TampaStationTypesPresentation.pdf

In my view, the redevelopment opportunities presented by commercial corridors are largely under-estimated by both the public and the private sectors. Public-private partnerships can be formed to leverage resources of both to meet emerging market demand. After all, many of the sites along these corridors have attributes making them ideal candidates for redevelopment:

1. Almost all of these sites sit along major highways with four lanes, often with wide rights-of-way for easements. Because they are along multilane corridors that connect urban and suburban nodes, in my view these sites are "transit-supportive." For insights on retrofitting streets and corridors, I recommend an extensive video presentation offered by the American Planning Association.[18]

2. 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, and this reality is faced by both fully developed communities and those that still have a significant stock of raw land. The conundrum facing local governments that do possess raw land is the choice between 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.

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

4. These sites have owners motivated to 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. For an overview, I recommend a presentation developed by HDR Consulting on the business case for encouraging investing in transit in existing commercial corridors.[19]

5. As these sites age—Part 3 shows that most of them age rapidly—aging structures may compromise the value of nearby residential property.

6. 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.

First, tearing down the old to replace it with something more contemporary or at higher land-use intensity can be inappropriate or even damaging if an existing structure is important to the character and/or residents of a place. 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

[18] Available at http://www.planning.org/store/product/?ProductCode=STR_TSCRSC.

[19] See http://www.aarp.org/content/dam/aarp/livable-communities/act/transportation/transit-oriented-development-aarp.pdf.

historical and architectural character. My purpose here is to offer the broad perspective that most nonresidential properties existing in urban and suburban areas are not worth preserving but instead have potential to serve future development needs in the Metro area.

Second, will low-intensity parcels be redeveloped at a density to support walkable, mixed-use, mixed-income, 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 roadblock to timely redevelopment is uncertainty by property owners about when to redevelop; they usually err on the side of caution so that redevelopment is deferred. Public officials and planners need to be proactive in identifying those parcels that may become ripe for redevelopment within various time frames, such as between 2010 and 2030, to 2040, and beyond. These parcels should also be vetted to prioritize locations that support walkable, mixed use, mixed-income, and transit-oriented neighborhoods.

There is a third reason why property—both residential and nonresidential—may not be efficiently redeveloped: local land use policies (Arora 2007). A study for 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 overall needs (Kuzmyak et al. 2003). Devoting more land for parking reduces the potential for more construction to occur and with it the ability to support more jobs and add more value to the local fiscal base. Unfortunately, local zoning codes, especially those in suburban areas, require 50 percent more parking space than is really needed. These excessive parking requirements sap economic development potential. For another, land use policies that reduce residential density below what the market supports have the effects of increasing public facility costs per unit, reducing overall value per acre of land, and increasing the cost of housing, which can disproportionately impact choice and opportunity, particularly for those of low-income

The suburbs will be where much of this redevelopment can occur. This is where most Metro area residents live and where most jobs are found. Suburban commercial areas are mostly composed of low-rise structures along corridors with occasional activity nodes, also at low-intensity use. *Retrofitting Suburbia*, by Ellen Dunham-Jones and June Williamson (2008), and Williamson's *Designing Suburban Futures* (2013) show how communities can turn transit-supportive corridors into transit corridors, and developers, perhaps through public-private partnerships, 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 new greenfield community development, most of the Metro area's development needs between 2010 and 2040 can be accommodated by retrofitting suburbs, and this can be done without invading established residential neighborhoods.* The challenge is creating public-private-civic collaborations that can accomplish this.

An Agenda for Reshaping the Metro area

What can be done now to meet emerging market demands and be responsive to emerging preferences? Several ideas emerge that may be addressed at the local, regional, and state levels. Before proceeding, I caution that my outline does not directly include such broadly important issues as housing affordability, environmental quality, economic development, fiscal resilience, and quality of life. I rather focus on more narrow objectives of seizing emerging housing preference patterns and nonresidential redevelopment opportunities. Doing so may facilitate co-benefits in many other areas of regional concern.

Local

- Planners must update land-use plans and land-use codes to get ahead of the curve by adequately, realistically addressing housing needs to 2040. The parents of the boomers and the boomers as parents remade the built landscape to serve their needs. Those needs have largely been met, but the very land-use tools used to achieve this are ill suited to meeting the needs of a much more culturally, socially, economically, and household-structurally diverse society. New land-use plans and implementing ordinances need to get beyond the baby boom time warp.

- Housing choices will need to be expanded to include more attached and small-lot options in neighborhoods that are or have the potential to be walkable, with a mix of uses and access to transit, and that include affordable options for a range of diverse households, including those with special needs. As shown in parts 1 and 2, the share of households with traditional mother-father-children compositions who want larger homes on larger lots in the suburbs is declining. The future of the Metro area is in meeting the very different needs of people living alone—most of whom will be boomers who lose their partners between now and 2040—and younger households who will mostly rent until they decide to buy. When they buy, a large share of next-generation households will want neighborhoods different from those where they were raised. Yet, most of the demand for these housing options will be in the suburbs and will need to provide the benefits of mixed-use and mixed-income,walkable, transit-served communities.

- Those options should include expanded local consideration of accessory dwelling unit options. When of sufficient quality and designed in a way that provides architectural continuity, and where local governments have capacity for regulation and enforcements, accessory dwelling units can help make homeownership more sustainable for lower-income households, help the elderly age in place through a steady income supplement, or can provide the opportunity for multi-generational family co-location.

- Water, sewer, and drainage infrastructure planners and engineers, especially in suburban fringe areas, may need to rethink their investment-return assumptions before jurisdictions become financially stressed, especially if those assumptions are based on extrapolation of past trends.

- Economic competitiveness cannot be viewed as opening the next distant office or industrial park but should focus on the redevelopment of existing commercial corridors and nodes. Existing and new public sector tools should be used to leverage private redevelopment of these opportunities.

Regional

- Regional agencies can use their information and education tools to elevate regional knowledge of the sweeping nature of demographic changes that will occur.

- Regional agencies should show the effects of different land use and transportation scenarios.

- A regional land inventory should be considered so that priority sites and redevelopment opportunities can be discussed and planned for in a wider regional context.

- Regional education efforts can be used to show the benefits of improved housing choices, jobs-housing balance affordable and workforce housing.

- Fortunately, the Metro Council area has a modern regional transit system that connects key centers and other nodes along existing commercial corridors. It should continue to be improved and expanded in a way that maximizes the integration of higher-density redevelopment with transit options.The Metro Council is one of the few metropolitan areas that targets special funds to improve housing opportunities. The Livable Communities Act (LCA) created the Livable Communities Fund, consisting of three current funds: (1) the Local Housing program Account helps expand and preserve lifecycle and affordable rental and ownership housing; (2) The Tax Base Revitalization Account helps revitalize declining areas; and (3) The Livable Communities Demonstration Account funds development and redevelopment projects that link housing, jobs and services and that use infrastructure and regional facilities efficiently. [20]

- The Metro Council might also consider using some of its U.S. DOT-provided planning funds to help local governments engage in land-use and transportation planning that improves the regional distribution of growth and development. In particular, it should consider using a portion of its federal transportation investment revenue to help implement those plans. I recommend the Atlanta Regional Commission's Livable Centers Initiative as a model to adapt to the Metro Council area.[21]

- Metro Council is preparing a new regional housing policy. The plan should support community planning and implementation policies that broaden housing choices.

State

- While the Metro Council is a national leader in regional coordination of land use, some leapfrog growth is locating new exurbs and suburbs beyond the 7-counties Metro Council jurisdiction. Many of these suburban fringe and exurban communities do not have the resources to make and implement plans that facilitate change efficiently, effectively, and equitably. State and regional agencies need to partner with those suburban communities to help them get ahead of the curve.

The challenge for the Metro Council region is to be assertive in creating public-private-civil partnerships to meet future housing needs and reshape the massive commercial redevelopment that will occur. If this can be done, perhaps new attached housing and nonresidential development can occur in mixed-use configurations on existing built spaces—which today are mostly parking lots. Doing so will make modern transit options such as light rail and bus rapid transit even more feasible and responsive to markets.

[20] For details, see http://www.metrocouncil.org/Communities/Services/Livable-Communities-Grants/Maps,-forms-misc/2014-LCA-Fund-Distribution-Plan.aspx.
[21] I recommend that all MPOs adapt the Atlanta Regional Commission's "Livable Centers Initiative". For details, seewww.atlantaregional.com/land-use/livable-centers-initiative.

REFERENCES AND SELECTED BIBLIOGRAPHY

AARP Public Policy Institute. *Community Transportation Survey*. Washington, DC: AARP, 1997.

Adams, James Truslow. *The Epic of America*. New York: Little, Brown, and Co., 1931.

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

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

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

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

Ascierto, Jerry. "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*, November-December 2010: 17-22.

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

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

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

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

Baum-Snow, Nathaniel, and Mathew E. Snow. "The Effects of New Public Projects to Expand Urban Rail Transit." *Journal of Public Economics* 77, 2000: 241-263.

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

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

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

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

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

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

Baxandall, Phineas, Tony Dutzik, and Joshua Hoen. *A Better Way to Go: Meeting America's 21st Century Transportation Challenges with Modern Public Transit*. Washington, DC: U.S. PIRG Education Fund and Frontier Group, 2008.

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

Blais, Pamela. *Perverse Cities: Hidden Subsidies, Wonky Policy, and Urban Sprawl*. Vancouver, B.C.: UBC Press, 2010.

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

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

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

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

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

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

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

Carlino, Gerald, Satyajit Chatterjee, and Robert Hunt. *Urban Density and the Rate of Invention.* Philadelphia: Federal Reserve Bank of Philadelphia, Working Paper 06-14, 2006. www.philadelphiafed.org/research-and-data/regional-economy/regional-research/index.cfm?tab=3.

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

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

Center for Transit Oriented Development. *National TOD Database*. Chicago: Center for Neighborhood Technology, 2011. 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. *Transit-Oriented Development in the United States: Experiences, Challenges, and Prospects*. TCRP Report 102. Washington, DC: National Academy Press, 2004.

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

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

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

Cisneros, Henry. Independent for Life: Homes and Neighborhoods for an Aging America. Austin, TX: University of Texas Press, 2012.

Cobb, Rodney J., and Scott Dvorak. *Accessory Dwelling Units: Model State Act and Local Ordinance.* Washington, DC: AARP, 2000.

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

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

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

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

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

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

Day, Jennifer Cheeseman. *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, 1996.

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, 2007: 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, 2007: 2048-2067.

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

Diamond, Rick, and Mithra Moezzi. *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, 1994.

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

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

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

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

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

Energy Information Administration. *EIA Weekly Petroleum Status Report*, April 12, 2011. Washington, DC: U.S. Department of Energy, 2011. 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. *Economic Returns from Transportation Investment*, 1996. www.fhwa.dot.gov/policy/otps/060320a/index.htm.

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

Ewing, Reid (2009). "Highway Induced Development: What Research in Metropolitan Areas Tells Us." In M. Boarnet (ed.), Transportation Infrastructure: The Challenges of Rebuilding America, American Planning Association, Chicago, IL, 2009, pp. 27-40, 2009.

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

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

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

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

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

Faiola, Anthony, Ellen Nakashima, and Jill Drew. "What Went Wrong?" *Washington Post*, October 15, 2008. 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. *Land Use and Development Along the Rosslyn-Ballston Metro Corridor*. 2005. www.fairfaxcounty.gov/dpz/tysonscorner/nofind/arlingdoc.pdf.

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

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

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

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

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

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

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

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

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

Glaeser, Edward L. "Goodbye, Golden Years." *New York Times*, November 19, 2011. www.nytimes.com/2011/11/20/opinion/sunday/retirement-goodbye-golden-years.html?pagewanted=all.

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

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

Goldin, Claudia (2004). "The Long Road to the Fast Track: Career and Family," *Annals of the Amer. Acad. of Political and Social Science*, May 2004 (596): 20-35.

Hamilton, B.E., J.A. Martin, and S.J. Ventura. "Births: Preliminary Data for 2007." *National Vital Statistics Reports* (57): 12. Hyattsville, MD: National Center for Health Statistics, 2009.

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

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

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

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

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

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

Holtzclaw, John, Robert Clear, Hank Dittmar, David Goldstein, and Peter Haas. "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), 2002: 1-27.

National Alliance to End Homelessness. *Data Snapshot: Doubled Up in the United States*. Washington, DC National Alliance to End Homelessness, 2007. http://www.endhomelessness.org/library/entry/data-snapshot-doubled-up-in-the-united-states

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

ICF Consulting. *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, 2011. www.epa.gov/oms/stateresources/policy/420r11003.pdf.

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

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

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

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

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

Jonathan Rose Companies. *Location Efficiency and Housing Type—Boiling It Down to BTUs.* Washington, DC: Environmental Protection Agency, 2011. epa.gov/smartgrowth/location_efficiency_BTU.htm.

Juergensmeyer, Julian, and Conrad Juergensmeyer. "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, 1988.

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

Keenan, Teresa A. *Home and Community Preferences of the 45+ Population*. Washington, DC: AARP, 2010.

Kim, Sukkoo. "Changes in the Nature of Urban Spatial Structure in the United States, 1890–2000." *Journal of Regional Science* 47(2), 207: 273-287.

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

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

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

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

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

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

Leinberger, Christopher. “Here Comes the Neighborhood.” *The Atlantic*, June 2010. www.theatlantic.com/magazine/archive/2010/06/here-comes-the-neighborhood/8093/.

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

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

Li, F., P. Harmer, B.J. Cardinal, M. Bosworth, D. Johnson-Shelton, J.M. Moore, A. Acock, and N. Vongjaturapat. “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), 2009: 409-12, discussion 413-4.

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

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

Litman, Todd(2010a). *Land Use Impacts on Transportation*. Victoria, BC: Victoria Transport Policy Institute, 2010. 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, 2010. www.vtpi.org/aff_acc_hou.pdf.

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

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

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

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

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

McIlwain, John. *Housing in America: The Next Decade*. Washington, DC: Urban Land Institute, 2009.

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

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

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, 2011. ssrn.com/abstract=1783729 or dx.doi.org/10.2139/ssrn.1783729.

Mathur, Shishir, and Christopher E. Ferrell. *Effect of Suburban Transit Oriented Developments on Residential Property Values*. San Jose, CA: Mineta Transportation Institute, San Jose State University, 209. www.transweb.sjsu.edu/MTIportal/research/publications/documents/Effects%20of%20Sub-Urban%20Transit%20%28with%20Cover%29.pdf.

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

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

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

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

Marshall & Swift. *Marshall Valuation Service.* Los Angeles, CA: Marshall & Swift.

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

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

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

Mishel, Lawrence, Josh Bivens, Elise Gould and Heidi Shierholz, *The State of Working America*, Washington, DC: Economic Policy Institute. http://www.stateofworkingamerica.org/, 2012.

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

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

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

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

Myers, D., and S.H. Ryu. "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), 2008: 17-33.

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

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

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

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

Nelson, Arthur C. (2009a) "The New Urbanity: The Rise of a New America." *Annals of the Academy of Political and Social Science* 626(1), 2009:192-208.

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

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

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

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

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

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

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

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." In *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, and C.E. Hanson, eds.. Cambridge, UK: Cambridge University Press, 2007, 315-356.

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

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

Norris, Nathan. "Why Gen Y Is Causing the Great Migration of the 21st Century." *Better! Cities & Towns*, blog post, April 9, 2012. bettercities.net/news-opinion/blogs/nathan-norris/17803/why-gen-y-causing-great-migration-21st-century**.**

Parsons Brinckerhoff Quade & Douglas. *Transit and Urban Form*. Washington, DC: National Academy Press, 1996.

Peiser, Richard. "Decomposing Urban Sprawl." *Town Planning Review* 76(3), 2001: 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, 2009. www.nbrti.org/docs/pdf/Property%20Value%20Impacts%20of%20BRT_NBRTI.pdf.

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

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

Portland, City of. *Portland Streetcar Development Oriented Transit.* Portland Office of Transportation and Portland Streetcar, Inc., 2008. www.portlandstreetcar.org/pdf/development_200804_report.pdf.

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

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

Rampey, B.D., G.S. Dion, and P.L. Donahue. *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, 2009. nces.ed.gov/nationsreportcard/pdf/main2008/2009479.pdf.

Rauch, James E. "Productivity Gains from Geographic Concentration of Human Capital: Evidence from the Cities." *Journal of Urban Economics* 34(3), 193: 380-400.

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

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

Reconnecting America: Center for Transit-Oriented Development. *Station Area Planning Manual*. San Francisco, CA: Metropolitan Transportation Commission, 2007. www.bayareavision.org/.../Station_Area_Planning_Manual_Nov07.pdf.

Riche, M.F. “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, 2003, 125-147.

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

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

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

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

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

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

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

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

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

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

Bernstein, Scott, Carrie Makarewicz and Kevin McCarty. *Driven to Spend: Pumping Dollars Out of Our Households and Communities*. Washington, DC: Surface Transportation Policy Project, 2005. www.transact.org/library/reports_pdfs/driven_to_spend/Driven_to_Spend_Report.pdf.

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

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

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

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

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

Transportation Research Board. *Driving and the Built Environment: The Effects of Compact Development on Motorized Travel, Energy Use, and CO_2 Emissions*. Special Report 298. Washington, DC: Transportation Research Board, 2009. onlinepubs.trb.org/Onlinepubs/sr/sr298prepub.pdf.

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

Urban Land Institute. *Place Making Through Infill and Corridor Redevelopment.* Washington, DC: Urban Land Institute, 2010.

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

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

U.S. Census Bureau. *Statistical Abstract of the United States*, Washington, DC: U.S. Department of Commerce, 2003. Table HS-12.

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

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

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

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

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

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

U.S. Environmental Protection Agency. *Our Built and Natural Environments*. EPA 123-R-01-002. Washington, DC: EPA, 2001.

U.S. Environmental Protection Agency. *Parking Spaces/Community Places: Finding the Balance Through Smart Growth Solutions*. Washington, DC: EPA, 2006. www.epa.gov/smartgrowth/pdf/EPAParkingSpaces06.pdf.

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

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

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

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

Von Thünen, Johann Heinrich. *Der Isolierte Staat in Beziehung auf Landwirtschaft und Nationaloekonomie*. Munich: Pflaum, 1863.

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

Williamson, June. *Designing Suburban Futures*. Washington, DC: Island Press, 2013.

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

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

APPENDIX
County-level detailed tables corresponding to selected tables in text

Appendix to Table 1.1
Twin Cities Metro Area Projections to 2020, 2030 and 2040
[Figures in thousands]

Metric	Anoka	Carver	Dakota	Hennepin	Ramsey	Scott	Washington	Metro Area
Population 2010	331	91	399	1,152	509	130	238	2,850
Population 2010-2020								
Population 2020	367	110	432	1,225	546	151	271	3,102
Population Change	36	19	33	73	37	21	33	252
Percent Change	13%	24%	12%	8%	7%	21%	16%	11%
Share of Metro Area	14%	7%	15%	30%	12%	9%	12%	
Population 2010-2030								
Population 2030	404	126	468	1,315	592	172	302	3,380
Population Change	73	35	69	162	83	42	64	530
Percent Change	24%	45%	22%	16%	14%	39%	29%	20%
Share of Metro Area	14%	7%	15%	31%	13%	9%	12%	
Population 2010-2040								
Population 2040	442	142	507	1,414	643	194	333	3,674
Population Change	111	51	109	262	134	64	95	824
Percent Change	34%	62%	32%	23%	20%	55%	39%	29%
Share of Metro Area	14%	7%	16%	32%	13%	9%	11%	

Appendix to Table 1.2
Racial/Ethnic Population, 2010 to 2020, 2030 and 2040
[Figures in thousands]

Metric	Anoka	Carver	Dakota	Hennepin	Ramsey	Scott	Washington	Metro Area
Baseline								
Change, 2010-2020	36	19	33	73	37	21	33	252
Change, 2010-2030	73	35	69	162	83	42	64	530
Change, 2010-2040	111	51	109	262	134	64	95	824
White Non-Hispanic								
Population 2010	289	84	337	852	350	113	209	2,234
Population 2020	295	94	333	815	337	119	217	2,210
Change 2010-2020	5	10	(4)	(37)	(13)	6	8	(25)
Change 2010-2020	12%	48%	-8%	-40%	-35%	22%	23%	-8%
Population 2030	304	104	333	790	327	126	226	2,211
Change 2010-2030	15	20	(4)	(62)	(23)	13	18	(23)
Change Share 2010-30	19%	49%	-4%	-34%	-31%	26%	26%	-4%
Population 2040	312	112	331	756	312	132	233	2,187
Change 2010-2040	23	28	(6)	(97)	(39)	19	24	(47)
Change Share 2010-40	20%	50%	-4%	-37%	-37%	27%	26%	-6%

Appendix to Table 1.2
Racial/Ethnic Population, 2010 to 2020, 2030 and 2040 – (Continued)
[Figures in thousands]

New Majority								
Population 2010	42	7	62	300	158	17	29	615
Population 2020	73	15	99	410	209	32	54	892
Change 2010-2020	37	8	37	110	51	15	25	277
Change 2010-2020	88%	52%	108%	140%	135%	78%	77%	108%
Population 2030	100	22	135	525	265	47	76	1,169
Change 2010-2030	58	15	73	225	107	30	47	554
Change Share 2010-30	81%	51%	104%	134%	131%	74%	74%	104%
Population 2040	130	29	176	659	331	62	100	1,487
Change 2010-2040	88	22	114	359	173	45	71	872
Change Share 2010-40	80%	50%	104%	137%	137%	73%	74%	106%

Appendix to Table 1.3
Senior Population 2010 to 2020, 2030 and 2040
[Figures in thousands]

Metric	Anoka	Carver	Dakota	Hennepin	Ramsey	Scott	Washington	Metro Area
Baseline								
Population 65+ 2010	32	8	40	131	61	10	25	307
Share of Population	10%	8%	10%	11%	12%	8%	10%	11%
65+, 2010-2020								
Population 2020	49	14	61	199	93	18	41	475
Share of Population	13%	12%	14%	16%	17%	11%	15%	15%
Population Change	17	6	21	68	32	8	16	168
Percent Change	53%	80%	52%	52%	52%	76%	64%	55%
Share of Net Growth	38%	29%	44%	74%	85%	29%	43%	54%
65+, 2010-2030								
Population 2030	73	22	87	280	131	27	61	681
Share of Population	18%	17%	18%	21%	22%	15%	20%	20%
Population Change	40	14	47	149	70	17	36	374
Percent Change	125%	184%	119%	114%	114%	171%	145%	122%
Share of Net Growth	50%	35%	53%	82%	95%	34%	53%	64%
65+, 2010-2040								
Population 2040	84	26	99	317	150	32	71	780
Share of Population	19%	18%	19%	22%	24%	16%	21%	21%
Population Change	52	19	60	186	89	22	46	473
Percent Change	160%	240%	150%	142%	145%	224%	184%	154%
Share of Net Growth	46%	33%	46%	71%	86%	32%	49%	57%

Appendix to Table 1.4
Change in Households by Type, 2010-2020, 2030 and 2040
[Figures in thousands]

Metric	Anoka	Carver	Dakota	Hennepin	Ramsey	Scott	Washington	Metro Area
Baseline, 2010								
Households	121	33	152	476	203	45	88	1,118
HHs with Children	45	14	54	136	59	20	34	361
HHs without Children	76	19	98	340	144	25	54	757
People living alone	28	6	39	161	69	8	19	330
Household Growth by Type, 2010-2020								
Households 2020	142	42	173	518	221	56	104	1,257
Household Growth	21	9	21	42	18	11	16	139
HHs with Children	50	16	57	143	62	23	38	390
HHs with Children Change	5	3	4	7	3	3	4	29
HHs with Children Share	25%	28%	18%	17%	19%	26%	27%	21%
HHs without Children	91	26	116	375	159	34	66	867
HHs w/o Children Change	15	7	17	35	15	8	12	110
HHs w/o Children Share	75%	72%	82%	83%	81%	74%	73%	79%
People living alone	34	9	44	178	77	12	23	377
People living alone Growth	6	3	5	18	8	3	4	47
People living alone Share	27%	30%	26%	42%	41%	28%	26%	34%

Appendix to Table 1.4
Change in Households by Type, 2010-2020, 2030 and 2040 – Continued
[Figures in thousands]

Metric	Anoka	Carver	Dakota	Hennepin	Ramsey	Scott	Washington	Metro Area
Household Growth by Type, 2010-2030								
Households 2030	160	51	193	559	239	67	119	1,388
Household Growth	39	18	41	83	36	22	31	270
HHs with Children	54	18	61	149	64	26	42	414
HHs with Children Change	9	5	7	13	6	6	8	53
HHs with Children Share	23%	26%	18%	16%	16%	26%	25%	20%
HHs without Children	106	32	132	410	174	42	78	973
HHs w/o Children Change	30	13	33	70	30	16	23	217
HHs w/o Children Share	77%	74%	82%	84%	84%	74%	75%	80%
People living alone	41	12	52	203	86	15	28	438
People living alone Growth	13	6	13	42	17	7	10	107
People living alone Share	33%	33%	32%	50%	47%	32%	31%	40%
Household Growth by Type, 2010-2040								
Households 2040	178	59	212	596	255	77	133	1,509
Household Growth	56	26	60	120	52	32	45	392
HHs with Children	59	20	66	161	69	29	46	450
HHs with Children Change	14	7	12	25	11	9	12	89
HHs with Children Share	24%	26%	20%	21%	20%	27%	27%	23%
HHs without Children	119	38	146	435	186	49	87	1,060
HHs w/o Children Change	43	19	48	95	41	24	33	303
HHs w/o Children Share	76%	74%	80%	79%	80%	73%	73%	77%
People living alone	46	15	57	219	92	19	32	480
People living alone Growth	18	8	18	58	23	10	13	150
People living alone Share	32%	32%	31%	49%	44%	32%	30%	38%

Appendix to Table 1.5
Households by Age Group, 1990–2010, 2010–2030, and 2010–2040
[Figures in thousands]

Metric	Anoka	Carver	Dakota	Hennepin	Ramsey	Scott	Washington	Metro Area
Change in Household Growth by Age, 1990-2010								
HH Change	39	16	54	56	12	26	39	241
HH Change <35	(5)	1	(4)	(18)	(11)	3	1	(33)
HH Change 35-64	32	13	43	64	21	20	28	220
HH Change 65+	12	3	15	11	2	4	10	57
HH <35 Share	-12%	3%	-8%	-31%	-91%	10%	2%	-14%
HH 35-64 Share	81%	82%	80%	114%	179%	76%	72%	91%
HH 65+ Share	32%	15%	28%	20%	15%	14%	26%	24%
Change in Household Growth by Age, 2010-2020								
HH Change	34	8	37	27	6	11	30	153
HH Change <35	4	2	5	(0)	(2)	3	5	16
HH Change 35-64	15	3	14	(4)	(4)	5	13	43
HH Change 65+	15	3	18	31	12	3	12	94
HH <35 Share	12%	24%	14%	-1%	-27%	23%	15%	11%
HH 35-64 Share	43%	40%	38%	-14%	-67%	49%	43%	28%
HH 65+ Share	45%	36%	49%	116%	194%	28%	41%	62%
Change in Household Growth by Age, 2010-2030								
HH Change	67	16	75	51	11	22	60	303
HH Change <35	8	4	12	4	(3)	6	8	38
HH Change 35-64	20	4	18	(11)	(4)	8	22	57
HH Change 65+	39	8	45	58	19	9	30	207
HH <35 Share	12%	23%	16%	8%	-28%	25%	14%	13%
HH 35-64 Share	30%	27%	24%	-22%	-34%	35%	37%	19%
HH 65+ Share	58%	50%	61%	115%	162%	40%	49%	68%

Appendix to Table 1.5
Households by Age Group, 1990–2010, 2010–2030, and 2010–2040 – Continued
[Figures in thousands]

Metric	Anoka	Carver	Dakota	Hennepin	Ramsey	Scott	Washington	Metro Area
Change in Household Growth by Age, 2010-2040								
HH Change	95	23	105	61	11	32	86	413
HH Change <35	13	4	18	15	0	7	12	69
HH Change 35-64	33	10	33	(2)	(1)	14	38	125
HH Change 65+	49	9	55	48	11	11	36	218
HH <35 Share	14%	18%	17%	25%	5%	22%	13%	17%
HH 35-64 Share	35%	41%	31%	-3%	-8%	44%	45%	30%
HH 65+ Share	51%	40%	52%	78%	104%	34%	42%	53%

Appendix to Table 1.6
Tenure Change to 2020, 2030 and 2040
[Figures in thousands]

Metric	Anoka	Carver	Dakota	Hennepin	Ramsey	Scott	Washington	Metro Area
Baseline 2010								
Owner Units	100	28	118	308	124	38	74	791
Renter Units	21	5	34	168	78	7	14	327
Ownership Rate	83%	84%	78%	65%	61%	85%	84%	71%
White N-H Rate	17%	16%	22%	35%	39%	15%	16%	29%
New Majority Rate	60%	62%	51%	34%	32%	68%	69%	39%
Tenure 2010-2020								
Owner Units 2020	116	35	133	330	133	47	88	881
Renter Units 2020	25	7	40	188	88	9	17	375
Ownership Rate 2020	83%	84%	78%	65%	61%	85%	84%	71%
Owner Change 2010-20	16	7	15	21	9	9	14	90
Renter Change 2010-20	5	2	6	21	9	2	3	48
Owner Share	78%	79%	70%	51%	48%	78%	83%	65%
Renter Share	22%	21%	30%	49%	52%	22%	17%	35%
Tenure 2010-2030								
Owner Units 2030	130	42	145	345	140	55	100	957
Renter Units 2030	30	9	48	214	99	12	19	431
Ownership Rate 2030	83%	84%	78%	65%	61%	85%	84%	71%
Owner Change 2010-30	30	14	27	37	16	17	26	166
Renter Change 2010-30	9	4	14	46	20	5	6	104
Owner Share	76%	78%	66%	45%	43%	77%	82%	61%
Renter Share	24%	22%	34%	55%	57%	23%	18%	39%

Appendix to Table 1.6
Tenure Change to 2020, 2030 and 2040 – Continued
[Figures in thousands]

Metric	Anoka	Carver	Dakota	Hennepin	Ramsey	Scott	Washington	Metro Area
Tenure 2010-2040								
Owner Units 2040	143	48	156	356	144	63	110	1,020
Renter Units 2040	35	11	55	240	111	15	22	489
Ownership Rate 2040	83%	84%	78%	65%	61%	85%	84%	71%
Owner Change 2010-40	42	20	38	48	20	25	36	229
Renter Change 2010-40	14	6	21	73	32	8	9	163
Owner Share	75%	78%	64%	40%	38%	76%	81%	58%
Renter Share	25%	22%	36%	60%	62%	24%	19%	42%

Appendix to Table 1.8
Excess Senior Home Sellers, 2010–2030
[Figures in thousands]

Analysis Period	Anoka	Carver	Dakota	Hennepin	Ramsey	Scott	Washington	Metro Area
2010-2020								
Cumulative Senior Seller Demand	11	3	12	37	17	3	8	91
Cumulative Buyer Supply	16	7	15	21	9	9	14	90
Difference	5	5	2	(16)	(8)	5	5	(1)
Unmet Senior Renter Demand				(7)				(0)
2010-2030								
Cumulative Senior Seller Demand	26	7	31	89	39	9	21	223
Cumulative Buyer Supply	30	14	27	37	16	17	26	166
Difference	3	7	(4)	(52)	(24)	8	5	(57)
Unmet Senior Renter Demand			(2)	(24)	(11)			(26)
2010-2040								
Cumulative Senior Seller Demand	47	13	54	152	67	16	37	385
Cumulative Buyer Supply	42	20	38	48	20	25	36	229
Difference	(4)	7	(15)	(104)	(47)	9	(1)	(156)
Unmet Senior Renter Demand	(2)		(7)	(47)	(21)			(70)

Appendix to Table 1.9
Change in Households by Income Category Relative to Metro area Median Income, 2010 to 2040
[Figures in thousands]

County	Total	0-30%	30-60%	60-80%	<80%	80+%
Baseline 2010						
Anoka	121	16	18	15	50	71
Carver	33	4	4	3	11	22
Dakota	152	20	22	18	60	92
Hennepin	476	88	81	56	225	251
Ramsey	203	45	40	26	111	92
Scott	45	4	5	5	14	31
Washington	88	10	11	9	30	58
Planning Year 2040						
Anoka	178	21	28	26	75	102
Carver	59	6	8	7	21	38
Dakota	211	25	32	30	87	124
Hennepin	597	106	115	88	308	289
Ramsey	255	55	57	42	154	101
Scott	77	7	10	10	27	50
Washington	133	13	18	17	48	85
Change 2010-2040						
Anoka	56	5	9	11	25	31
Carver	26	2	4	4	10	16
Dakota	59	5	10	12	27	32
Hennepin	121	18	34	32	83	38
Ramsey	52	10	18	16	43	9
Scott	32	3	5	5	12	20
Washington	45	4	7	7	18	27

Appendix to Table 1.9
Change in Households by Income Category Relative to Metro area Median Income, 2010 to 2040
[Figures in thousands]

County	Total	0-30%	30-60%	60-80%	<80%	80+%
Percent Change 2010-2040						
Anoka	47%	28%	51%	73%	50%	44%
Carver	79%	54%	97%	145%	95%	71%
Dakota	39%	25%	45%	64%	44%	35%
Hennepin	26%	21%	41%	56%	37%	15%
Ramsey	26%	22%	44%	59%	39%	10%
Scott	71%	60%	87%	114%	87%	64%
Washington	51%	37%	60%	82%	59%	47%

Appendix to Table 3.1
Metro area Space-Occupying Employment, 2010–2020
[Figures in thousands]

Area and Sector	2010	2020	Change	Percent	Share
Anoka					
Industrial	33	39	5	16%	33%
Office/Services	22	26	4	18%	24%
Retail/Lodging/Food	24	26	2	9%	14%
Institutional	23	28	5	21%	30%
Total	102	119	17	16%	
Carver					
Industrial	11	12	2	16%	36%
Office/Services	5	6	1	18%	18%
Retail/Lodging/Food	6	7	1	9%	12%
Institutional	8	9	2	21%	34%
Total	29	34	5	17%	
Dakota					
Industrial	41	48	7	16%	18%
Office/Services	115	136	21	18%	57%
Retail/Lodging/Food	33	36	3	9%	8%
Institutional	30	37	6	21%	17%
Total	220	257	38	17%	
Hennepin					
Industrial	162	189	27	16%	14%
Office/Services	579	686	107	18%	58%
Retail/Lodging/Food	148	162	14	9%	8%
Institutional	171	208	37	21%	20%
Total	1,061	1,245	184	17%	

Appendix to Table 3.1
Metro area Space-Occupying Employment, 2010–2020 – Continued
[Figures in thousands]

Area and Sector	2010	2020	Change	Percent	Share
Ramsey					
Industrial	53	61	9	16%	12%
Office/Services	197	233	36	18%	52%
Retail/Lodging/Food	60	66	6	9%	8%
Institutional	88	106	19	21%	27%
Total	398	467	69	17%	
Scott					
Industrial	9	11	2	16%	31%
Office/Services	2	2	0	18%	7%
Retail/Lodging/Food	14	15	1	9%	25%
Institutional	9	11	2	21%	37%
Total	33	38	5	15%	
Washington					
Industrial	12	14	2	16%	18%
Office/Services	17	20	3	18%	30%
Retail/Lodging/Food	22	24	2	9%	19%
Institutional	16	20	4	21%	33%
Total	67	78	11	16%	

Appendix to Table 3.1
Metro area Space-Occupying Employment, 2010–2030
[Figures in thousands]

Area and Sector	2010	2030	Change	Percent	Share
Anoka					
Industrial	33	39	6	18%	25%
Office/Services	22	29	7	32%	30%
Retail/Lodging/Food	24	26	2	9%	9%
Institutional	23	31	8	36%	35%
Total	102	125	23	23%	
Carver					
Industrial	11	13	2	18%	28%
Office/Services	5	6	2	32%	23%
Retail/Lodging/Food	6	7	1	9%	8%
Institutional	8	10	3	36%	41%
Total	29	36	7	23%	
Dakota					
Industrial	41	49	7	18%	13%
Office/Services	115	152	37	32%	63%
Retail/Lodging/Food	33	36	3	9%	5%
Institutional	30	41	11	36%	19%
Total	220	278	58	27%	
Hennepin					
Industrial	162	191	29	18%	10%
Office/Services	579	765	186	32%	64%
Retail/Lodging/Food	148	162	14	9%	5%
Institutional	171	233	62	36%	21%
Total	1,061	1,351	291	27%	

Appendix to Table 3.1
Metro area Space-Occupying Employment, 2010–2030 – Continued
[Figures in thousands]

Area and Sector	2010	2030	Change	Percent	Share
Ramsey					
Industrial	53	62	9	18%	9%
Office/Services	197	260	63	32%	58%
Retail/Lodging/Food	60	66	6	9%	5%
Institutional	88	119	32	36%	29%
Total	398	508	110	28%	
Scott					
Industrial	9	11	2	18%	25%
Office/Services	2	2	1	32%	9%
Retail/Lodging/Food	14	15	1	9%	19%
Institutional	9	12	3	36%	47%
Total	33	40	7	20%	
Washington					
Industrial	12	14	2	18%	14%
Office/Services	17	23	6	32%	35%
Retail/Lodging/Food	22	24	2	9%	13%
Institutional	16	22	6	36%	38%
Total	67	83	16	23%	

Appendix to Table 3.1
Metro area Space-Occupying Employment, 2010–2040
[Figures in thousands]

Area and Sector	2010	2040	Change	Percent	Share
Anoka					
Industrial	33	38	5	14%	15%
Office/Services	22	32	10	46%	32%
Retail/Lodging/Food	24	27	3	13%	10%
Institutional	23	36	13	57%	42%
Total	102	133	31	30%	
Carver					
Industrial	11	12	2	14%	17%
Office/Services	5	7	2	46%	25%
Retail/Lodging/Food	6	7	1	13%	9%
Institutional	8	12	4	57%	49%
Total	29	38	9	31%	
Dakota					
Industrial	41	47	6	14%	7%
Office/Services	115	168	53	46%	66%
Retail/Lodging/Food	33	37	4	13%	5%
Institutional	30	48	17	57%	22%
Total	220	300	80	37%	
Hennepin					
Industrial	162	185	23	14%	6%
Office/Services	579	845	266	46%	65%
Retail/Lodging/Food	148	168	20	13%	5%
Institutional	171	269	98	57%	24%
Total	1,061	1,467	407	38%	

Appendix to Table 3.1
Metro area Space-Occupying Employment, 2010–2040 – Continued
[Figures in thousands]

Area and Sector	2010	2040	Change	Percent	Share
Ramsey					
Industrial	53	60	8	14%	5%
Office/Services	197	287	90	46%	58%
Retail/Lodging/Food	60	68	8	13%	5%
Institutional	88	138	50	57%	32%
Total	398	554	156	39%	
Scott					
Industrial	9	11	1	14%	15%
Office/Services	2	3	1	46%	9%
Retail/Lodging/Food	14	15	2	13%	20%
Institutional	9	14	5	57%	56%
Total	33	42	9	27%	
Washington					
Industrial	12	14	2	14%	8%
Office/Services	17	25	8	46%	36%
Retail/Lodging/Food	22	25	3	13%	13%
Institutional	16	26	9	57%	43%
Total	67	89	22	33%	

Appendix to Table 3.4
Metro Area Nonresidential Space Development 2010–2020
[Figures in millions]

Area and Development Metric	2010	2020	Change	Percent Change	Change Share
Anoka					
Square Feet Supported	71	82	11	16%	33%
Square Feet Recycled			23		67%
Total New Construction			34		
Percent of Square Feet Supported 2010					48%
Carver					
Square Feet Supported	21	25	3	16%	33%
Square Feet Recycled			7		67%
Total New Construction			10		
Percent of Square Feet Supported 2010					48%
Dakota					
Square Feet Supported	113	131	18	16%	35%
Square Feet Recycled			34		65%
Total New Construction			52		
Percent of Square Feet Supported 2010					47%
Hennepin					
Square Feet Supported	521	607	85	16%	40%
Square Feet Recycled			128		60%
Total New Construction			213		
Percent of Square Feet Supported 2010					41%

Appendix to Table 3.4
Metro Area Nonresidential Space Development 2010–2020 – Continued
[Figures in millions]

Area and Development Metric	2010	2020	Change	Percent Change	Change Share
Ramsey					
Square Feet Supported	202	236	34	17%	41%
Square Feet Recycled			47		59%
Total New Construction			81		
Percent of Square Feet Supported 2010					40%
Scott					
Square Feet Supported	26	30	30	115%	75%
Square Feet Recycled			10		25%
Total New Construction			40		
Percent of Square Feet Supported 2010					153%
Washington					
Square Feet Supported	44	50	7	15%	30%
Square Feet Recycled			15		70%
Total New Construction			22		
Percent of Square Feet Supported 2010					51%

Appendix to Table 3.4
Metro Area Nonresidential Space Development 2010–2030
[Figures in millions]

Area and Development Metric	2010	2030	Change	Percent Change	Change Share
Anoka					
Square Feet Supported	71	85	14	20%	18%
Square Feet Recycled			65		82%
Total New Construction			79		
Percent of Square Feet Supported 2010					112%
Carver					
Square Feet Supported	21	26	4	21%	19%
Square Feet Recycled			19		81%
Total New Construction			24		
Percent of Square Feet Supported 2010					111%
Dakota					
Square Feet Supported	113	138	25	23%	21%
Square Feet Recycled			93		79%
Total New Construction			118		
Percent of Square Feet Supported 2010					105%
Hennepin					
Square Feet Supported	521	644	123	24%	29%
Square Feet Recycled			298		71%
Total New Construction			421		
Percent of Square Feet Supported 2010					81%

Appendix to Table 3.4
Metro Area Nonresidential Space Development 2010–2030 – Continued
[Figures in millions]

Area and Development Metric	2010	2030	Change	Percent Change	Change Share
Ramsey					
Square Feet Supported	202	251	49	24%	33%
Square Feet Recycled			99		67%
Total New Construction			148		
Percent of Square Feet Supported 2010					73%
Scott					
Square Feet Supported	26	31	5	18%	15%
Square Feet Recycled			27		85%
Total New Construction			31		
Percent of Square Feet Supported 2010					122%
Washington					
Square Feet Supported	44	52	9	20%	15%
Square Feet Recycled			51		85%
Total New Construction			59		
Percent of Square Feet Supported 2010					137%

Appendix to Table 3.4
Metro Area Nonresidential Space Development 2010–2040
[Figures in millions]

Area and Development Metric	2010	2040	Change	Percent Change	Change Share
Anoka					
Square Feet Supported	71	89	18	25%	12%
Square Feet Recycled			128		88%
Total New Construction			146		
Percent of Square Feet Supported 2010					206%
Carver					
Square Feet Supported	21	27	5	26%	13%
Square Feet Recycled			37		87%
Total New Construction			42		
Percent of Square Feet Supported 2010					200%
Dakota					
Square Feet Supported	113	145	33	29%	16%
Square Feet Recycled			177		84%
Total New Construction			210		
Percent of Square Feet Supported 2010					187%
Hennepin					
Square Feet Supported	521	685	164	32%	25%
Square Feet Recycled			505		75%
Total New Construction			670		
Percent of Square Feet Supported 2010					129%

Appendix to Table 3.4
Metro Area Nonresidential Space Development 2010–2040 – Continued
[Figures in millions]

Area and Development Metric	2010	2040	Change	Percent Change	Change Share
Ramsey					
Square Feet Supported	202	270	68	33%	31%
Square Feet Recycled			153		69%
Total New Construction			221		
Percent of Square Feet Supported 2010					109%
Scott					
Square Feet Supported	26	32	6	24%	11%
Square Feet Recycled			50		89%
Total New Construction			56		
Percent of Square Feet Supported 2010					218%
Washington					
Square Feet Supported	44	55	12	27%	10%
Square Feet Recycled			113		90%
Total New Construction			125		
Percent of Square Feet Supported 2010					288%