

# The Reconstruction of America



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Director, Metropolitan Institute  
Virginia Tech – Alexandria Center  
April 4, 2008



# Themes

- Growth is coming → and you can't duck it
- America's metropolitan areas are merging
- Demographics are changing needs profoundly
- Most growth will be redevelopment
- Metropolitan areas can accommodate large share of all growth on existing parking lots
  - with room for parking if we are smart
- Sustainability is plausible
- America can manage the next 100 Million sustainably (but what about the first 300 million?)



# Planning Goals 101

- Preserve public goods
- Minimize taxpayer costs
  - Mixed uses, higher density = lower costs
- Minimize adverse land-use interactions
- Maximize positive land-use interactions
  - Houston's beltways cost 100k retail & service jobs
- Prevent disproportionate burden shifting
  - Attractive cell towers even in low income neighborhoods
- Elevate quality of life:
  - Accessibility regardless of health or wealth
  - Neighborhood stability
  - Healthy environment



# America Grows

200 million in 1968

300 million in 2006

400 million in 2032

500 million in 2050

America adds 100 million people faster than any other nation except India and Pakistan – But *faster* than China.

*Source:* Arthur C. Nelson, Metropolitan Institute at Virginia Tech.

# Buildings to go up like never before

## Study: Half needed for 2030 don't exist

By Haya El Nasser  
USA TODAY

Residential and commercial development in the next quarter-century will eclipse anything seen in previous generations as the nation moves to accommodate rapid population growth, according to a Brookings Institution report today.

About half the homes, office buildings, stores and factories that will be needed by 2030 don't exist today, says Arthur C. Nelson, author of the report for the think tank in Washington, D.C.

The U.S. population is expected to increase 33% to 376 million by 2030, according to Nelson's analysis. That's 94 million more people than in 2000.

To serve that population, almost 60 million housing units will have to be built. About 20 million of these units will replace destroyed or aging homes. In addition, half of the largest metropolitan areas will have to add as much or more commercial and industrial space as existed in 2000, the report says.

The projections are startling for a nation already coping with sprawl, traffic congestion and the strains they put on the environment. Phenomenal growth in the South and West has turned deserts and soybean fields into cities. The report projects that these regions, which face water limitations, will experience the greatest surge in construction in the next 25 years.



### New housing needed

■ Your state by 2030, 4A

phenomenal growth in the South and West has turned deserts and soybean fields into cities. The report projects that these regions, which face water limitations, will experience the greatest surge in construction in the next 25 years.

"That kind of statistic is either terrifying or a wonderful opportunity," says David Goldberg, spokesman for Smart Growth America, a national coalition of groups that support managing growth.

If development patterns don't change, subdivisions will continue to sprout on farmland farther from metropolitan areas, requiring more

roads and sewer lines.

"We need to get this message out to planners so that they see the big numbers," says Nelson, director of urban affairs and planning at the Metropolitan Institute at Virginia Tech in Alexandria, Va. "There may be no better time than now to plan the shape of the landscape."

For generations, Americans favored single-family homes on larger lots. Development spread to where land is cheaper but within commuting distance to jobs.

Communities must decide if they "want to develop policies consistent with those preferences or constrain them," says John Kasarda, director of the Kenan Institute of Private Enterprise at the University of North Carolina-Chapel Hill. "Sprawl is a choice."

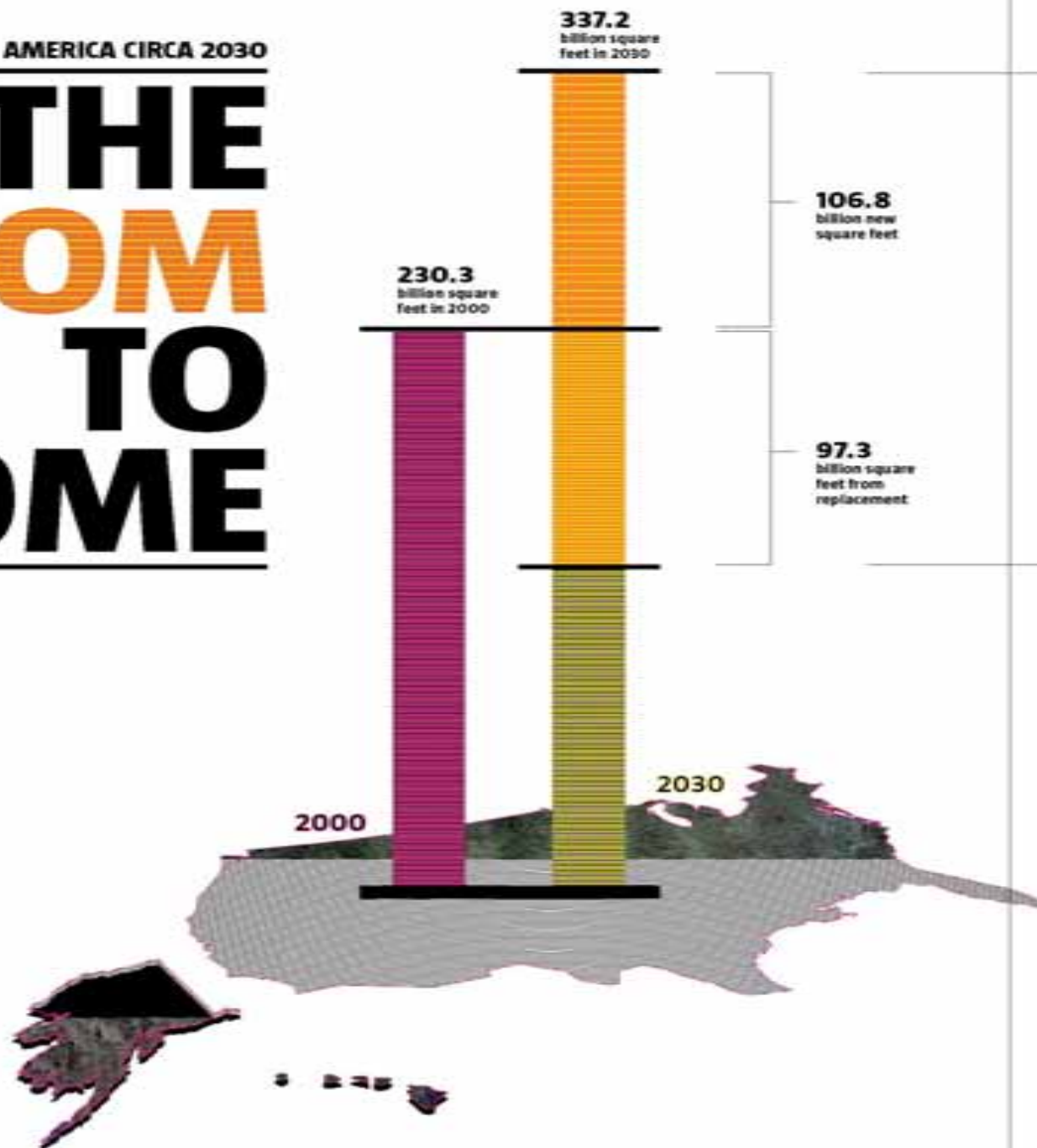
USA  
TODAY  
.com

John McIlwain, senior housing fellow at the Urban Land Institute, a research group that works with developers: "We're going to wind up with an average of 40% and 70% of development occurring where it's always occurred since World War II: on the outer edge."

Front Page  
December 4,  
2004

AMERICA CIRCA 2030

# THE BOOM TO COME



**institutional buildings is 50 years, on average. All too often, reuse seems financially unfeasible, with the result that new demand is met by new construction. This is beginning to change, as driven by three important factors.**

**FIRST**, society is changing dramatically, and along with it, people's preferences. In the 1950s, half of American households had children, and only about one in 10 was a single-person household. In 2030, only about a quarter of all households will have children, and about one in four will be a single-person household. Suburbs built to meet the demands of children no longer serve that purpose, and unless they retool, they will suffer economically. About 85 percent of the demand for housing will come from childless households.

**SECOND**, energy prices and congestion will force millions of households to reconsider whether living in distant suburban and exurban areas makes sense. It will to many, but to many more it may not.

**THIRD**, households are reconsidering what they want out of where they live. Because many professionals are having children later in life, they may not want to give up an urban lifestyle just to move to the suburbs where the "good schools" are,

longer in the next generation than in the last. Many realize that child rearing will consume about a quarter of their adult lives. Moreover, they will choose a different child-rearing lifestyle than that of their parents. Millions—and conceivably most of these Generation Y and Z households—want walkable neighborhoods where coffee pastries can be a principal social experience and as they go through life, they will want to remain in the same neighborhood.

While these patterns may appear to affect mostly residential development, think again. Millions in the next generation, and perhaps a majority, will want to live in communities with shopping, services, restaurants, and places to

### **The Less-Than-World-Wide Web**

Some may think that telecommuting and Internet retailing will have a dampening effect on nonresidential construction. Yet federal data indicate that office and retail space per capita rose nationally between 1992 and 2003—a testament to growing Internet activity. Although these influences may have a moderating effect, they are not considered significant factors. Why?



# Getting Ahead of the Curve

<u>US</u>	<u>2000</u>	<u>2040</u>
Population	281 million	433 million
Housing Units	116 million	178 million
<u>Jobs</u>	<u>166 million</u>	<u>249 million</u>

*Source:* Arthur C. Nelson, Metropolitan Institute at Virginia Tech





# Residential Development

US

2000 to 2040

Growth-Related Units

50 million

Replaced Units

39 million\*

Total Units

89 million

*\*Loss rate = ~ 6% per decade compounded.*

*Source:* Arthur C. Nelson, Metropolitan Institute at Virginia Tech



# Nonresidential Development

US

2000 to 2040

Growth-Related Square Feet

33 billion

Replaced Square Feet

94 billion\*

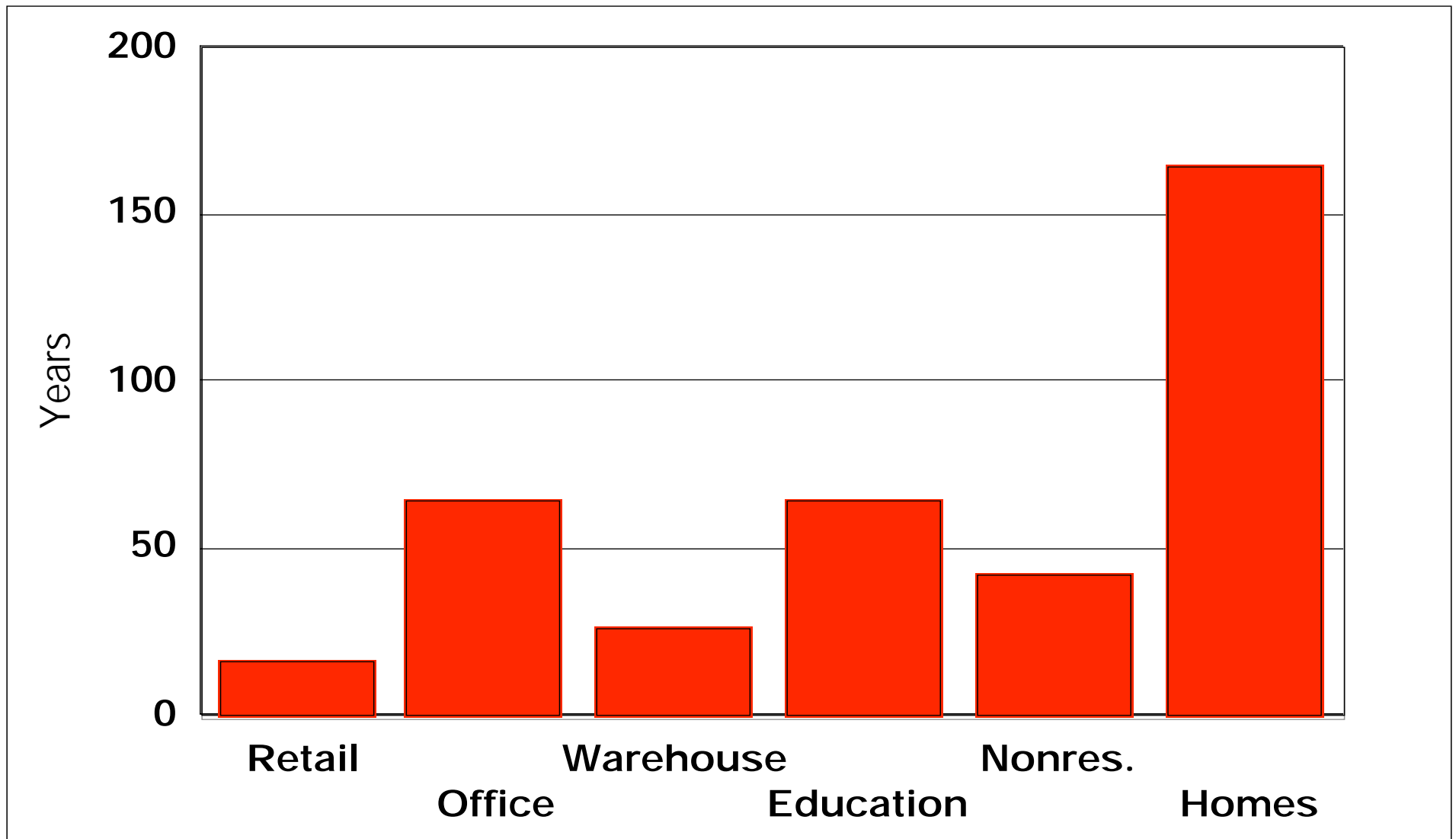
Total Square Feet

127 billion

*\*Loss rate = ~ 24% per decade compounded.*

Source: Arthur C. Nelson, Metropolitan Institute at Virginia Tech

# Life-Span of Building Function



*Source:* Arthur C. Nelson, Metropolitan Institute at Virginia Tech based on DoE Commercial Buildings Energy Consumption Survey.



# What About ....?

- Telecommuting?
- Internet retailing?
- Emerging technologies?

*And their effect on future space needs?*



# Telecommuting Promises

- Higher productivity
- Reduce traffic congestion
- Reduce air pollution



# Telecommuting Reality

- Cabin fever
  - Reduces productivity
  - Increases trips in am, noon, pm.
  - Increases peak emissions with “cold” starts.
- Census “work at home” telecommuting:
  - 1990 = 3.0%*
  - 2000 = 3.3%*

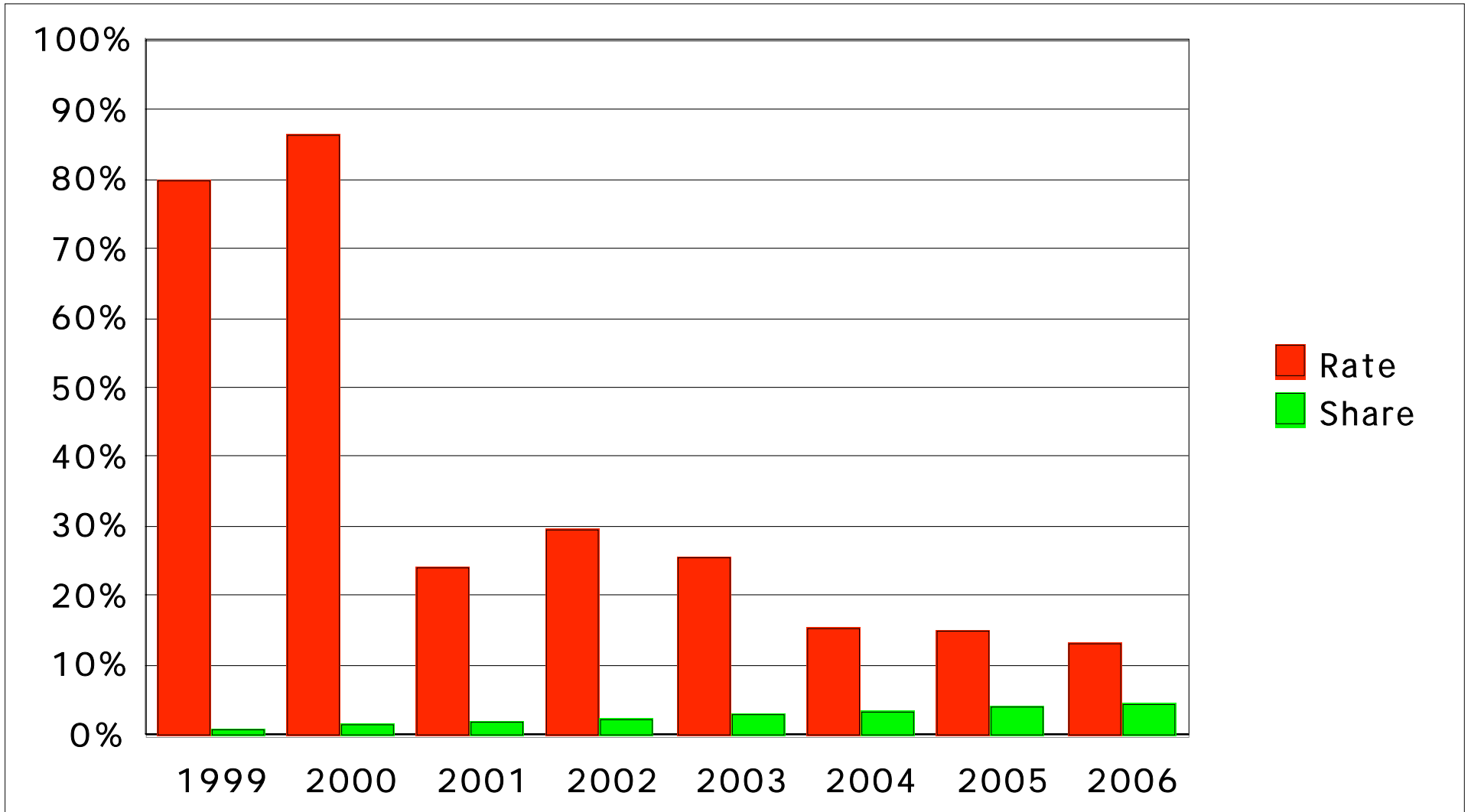


# Internet Retail Sales Growth Rate and Share Figures, 1998-2006

<u>Year</u>	<u>Share</u>
1998	0.46%
1999	0.83%
2000	1.54%
2001	1.92%
2002	2.48%
2003	3.11%
2004	3.59%
2005	4.14%
2006	4.69%

*Source:* Dept. of Commerce; analysis by Arthur C. Nelson

# Internet Retail Sales Growth Rate and Share, 1998-2006







# Retail Center Space Growth

<u>Year</u>	<u>GLA/Cap</u>
1986	14.7
1990	17.6
1995	18.9
2000	20.3
2005	20.5

*Source:* Compiled by Arthur A. Nelson, Metropolitan Institute, from National Research Bureau Shopping Center Database, CoStar Subsidiary.



# Reality Check

<u>Space Class</u>	<u>1992</u>	<u>2003</u>	<u>%Dif</u>
<b>Total <i>Glamour</i> Space</b>	<b>145</b>	<b>149</b>	<b>+3%</b>
Warehouse & Storage	45	35	-23%
All Other	75	63	-16%

Non-percentage figures per capita based on Census estimates.

*Source: Energy Information Administration, Commercial Buildings Energy Consumption Surveys for 1992 and 2003.*



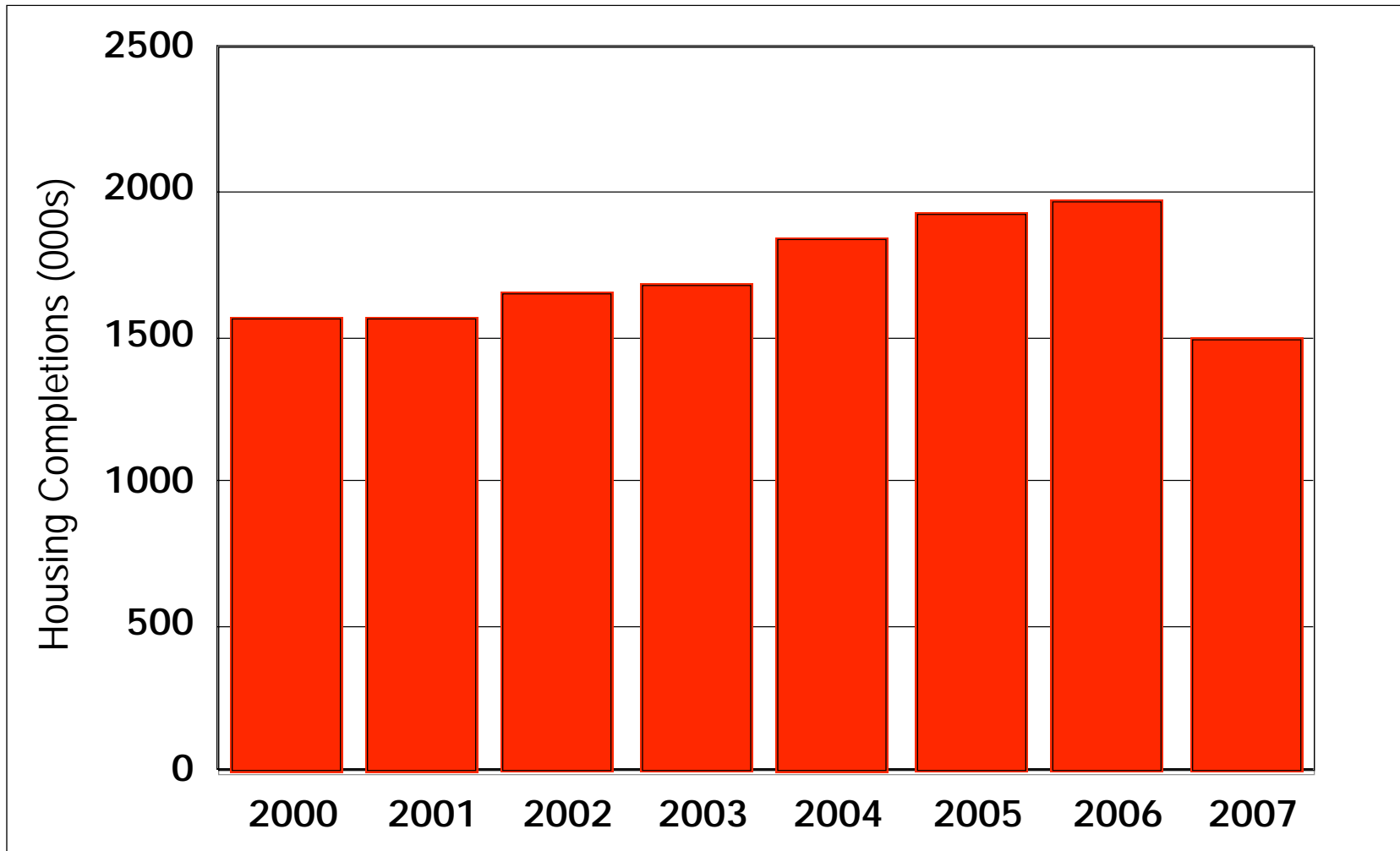
# Bottom Line

## New Construction 2000-2040

### Construction

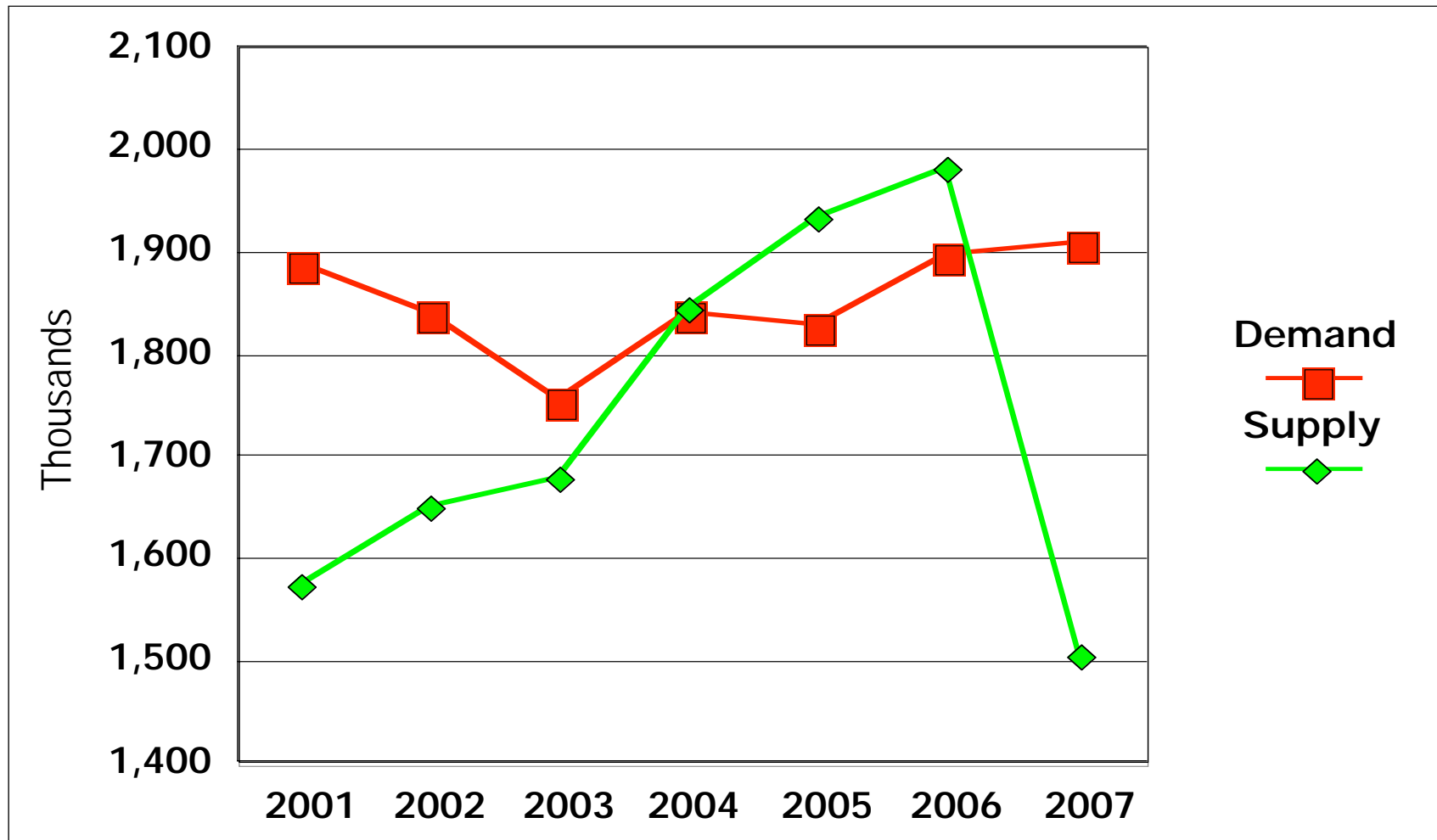
<i>Residential</i>	\$24 Trillion
<i>Nonresidential</i>	\$22 Trillion
<i>Infrastructure</i>	\$ 9 Trillion
<i>Total</i>	<b>\$55 Trillion</b>

# Housing in the Dumps?



*Source:* Arthur C. Nelson, Metropolitan Institute at Virginia Tech, adapted from Census Bureau.

# Tracking the Trends

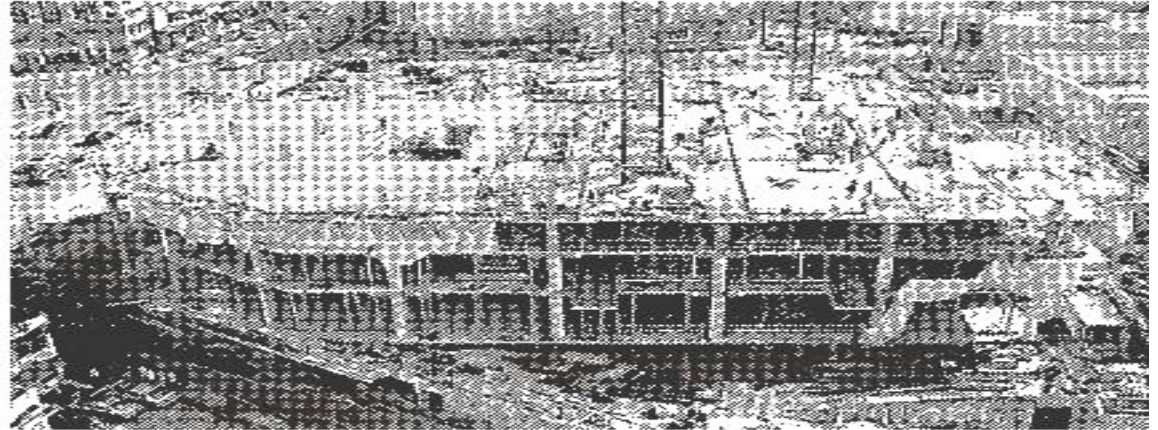


Source: Arthur C. Nelson, Metropolitan Institute at Virginia Tech, adapted from Census Bureau.

# Commercial Development Discipline

## Showing Discipline

The amount of new office and retail space built in the 50 largest U.S. markets during the latest business cycle was much less than before the commercial real-estate glut of the early 1990s.

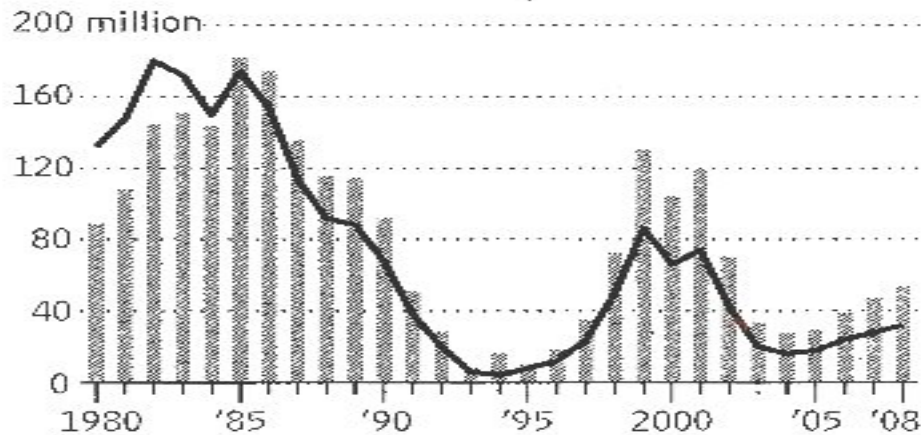


The Wisconsin Place Office building project in Bethesda, Md

## Complete construction

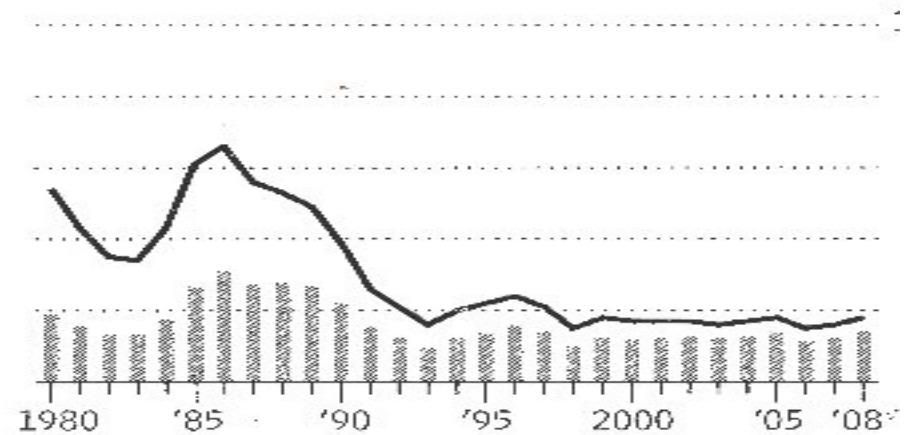
■ In square feet (left axis)  
 — As percentage of total inventory (right axis)

### Office



\*Projection

### Retail



Source: R

Source: *The Wall Street Journal*, REIS, 2006.



# **Squeezing Out Excess Housing**

## **Simple Arithmetic**

<b>Demand 2000-2007</b>	<b>12.9M units</b>
<b>Supply 2000-2007</b>	<b>14.0M units*</b>
<b>Excess</b>	<b>1.1M units</b>
<b>Current annual demand</b>	<b>1.9M units</b>
<b>Production 2007</b>	<b>1.5M units</b>

**Excess absorbed about mid-late 2009**

\*Includes estimate of conversions not reported by the Census.

Source: Arthur C. Nelson, Metropolitan Institute at Virginia Tech



# How Does It Grow?





# What is the Resale Market Telling Us?

- ④ Resale price analysis better than new sale analysis as it strips out the “sizzle”.
- ④ Resale prices of condominiums are approaching resale prices of single-family homes for first time ever
- ④ Appreciation of condominiums is higher than single-family homes nationally and every region



# Emerging Resale Price Evidence Trends 2006-2007

<u>Region</u>	<u>SF%</u>	<u>CC%</u>
<b>US</b>	<b>-1.2%</b>	<b>1.9%</b>
NE	2.4%	2.9%
MW	-3.2%	4.2%
S	-2.1%	0.8%
W	-1.5%	0.0%

SF includes detached and townhouse units. CC includes condominium and cooperative units.

*Source:* Adapted from National Association of Realtors, March 2008, by Arthur C. Nelson, Metropolitan Institute at Virginia Tech.



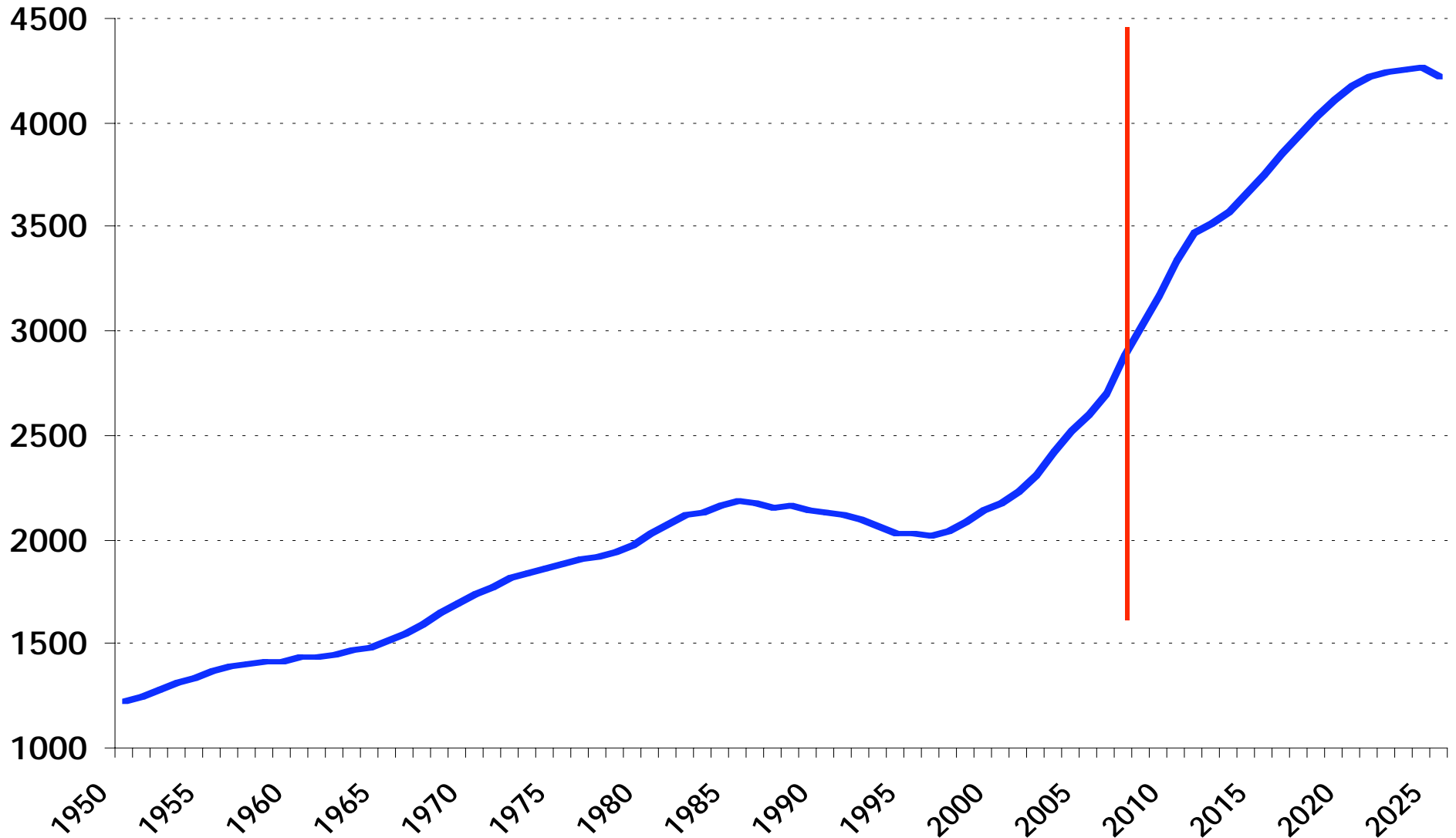
# “Traditional” Households on the Wane

<u>Household Type</u>	<u>1960</u>	<u>2000</u>	<u>2040</u>
HH with Children	48%	33%	28%
HH without Children	52%	67%	72%
Single-Person HH	13%	27%	29%

*Source:* Arthur C. Nelson, Metropolitan Institute at Virginia Tech.

# People Turning 65 *Each Year*

[Figures in 000s]



Source: US Census Bureau – 65+ in the United States: 2005; Wan He, Manisha Sengupta, Victoria A. Velkoff, & Kimberly A DeBarros. December 2005.



# Share of Growth 2000-2040

<u>HH Type</u>	<u>Growth</u>	<u>Share</u>
With children	9M	15%
<u>Without children</u>	<u>52M</u>	<u>85%</u>
Total new households	61M	
Single-person	21M	34%

Figures in millions of households.

*Source: Adapted and extrapolated from Martha Farnsworth Riche, *How Changes in the Nation's Age and Household Structure Will Reshape Housing Demand in the 21st Century*, HUD (2003).*



# What Futurists Tell Us

Bio-medical advances extend lifetimes.  
Insurance actuarial tables extend to 120.

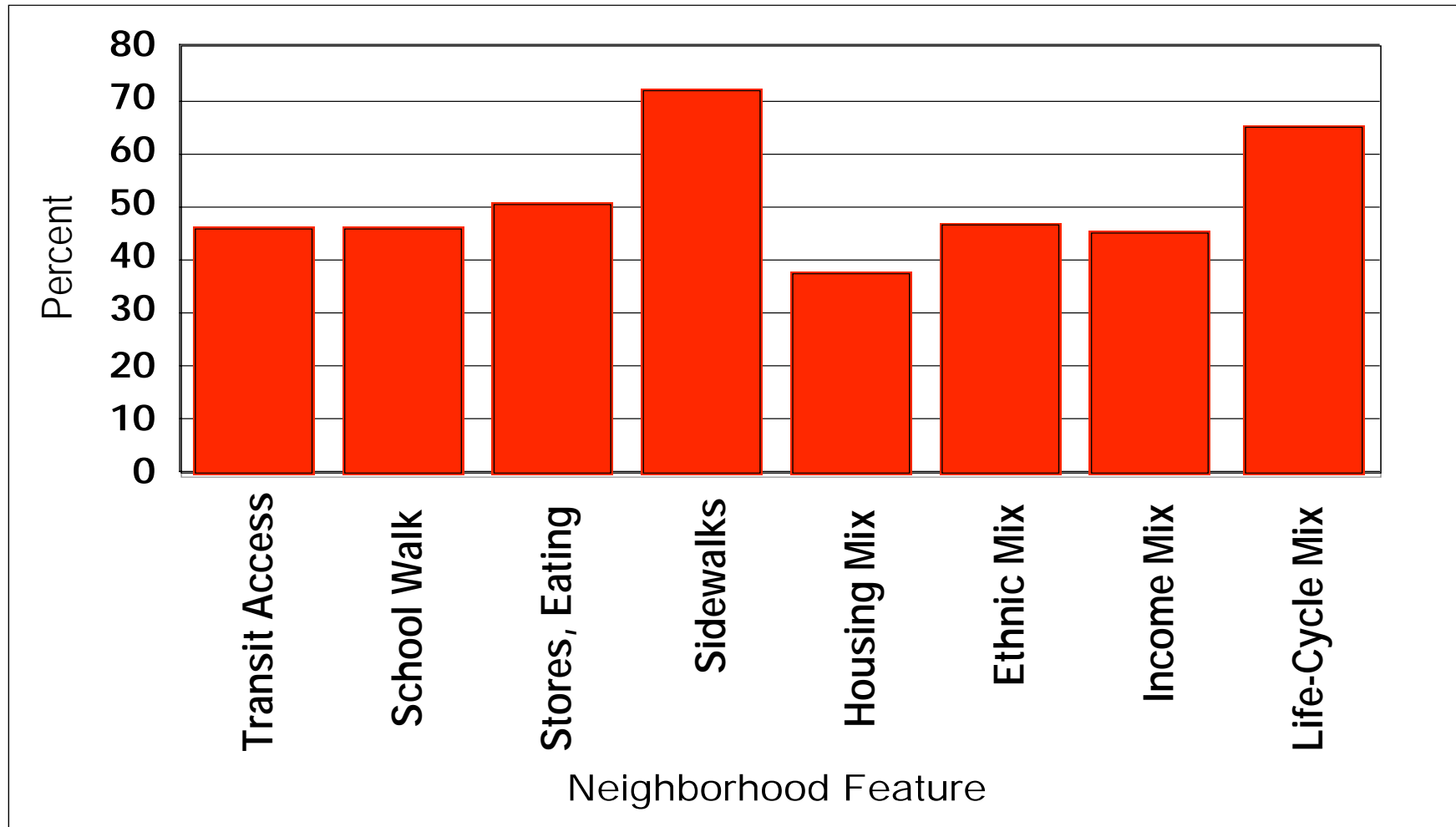
*Another 20 years added – minimum →*

*Census says 76 to 96*

Adulthood nearing 75% without child-rearing

Gen-X & -Y making “family” location decisions differently from their parents

# Neighborhood Feature Preferences



Source: National Association of Realtors, American Preference Survey 2004.



# Unmet *Walkable* Demand

<u>Residential Form</u>	<u>Boston</u>	<u>Atlanta</u>
% want drivable suburbs	30%	41%
<i>% of those who have</i>	<i>85%</i>	<i>95%</i>
% want walkable suburbs	40%	29%
<i>% of those who have</i>	<i>70%</i>	<i>35%</i>

Source: Jonathan Levine, *Zoned Out*, Resources for the Future, 2006.





# Retired Location Preference

In a city	14%
In a suburb close to a city	37%
<i>Total "urban"</i>	<i>51%</i>
In a suburb away from a city	19%
In a rural community	30%

*Suburbs away from cities are the losers*

Source: National Association of Realtors & Smart Growth America,  
American Preference Survey 2004.



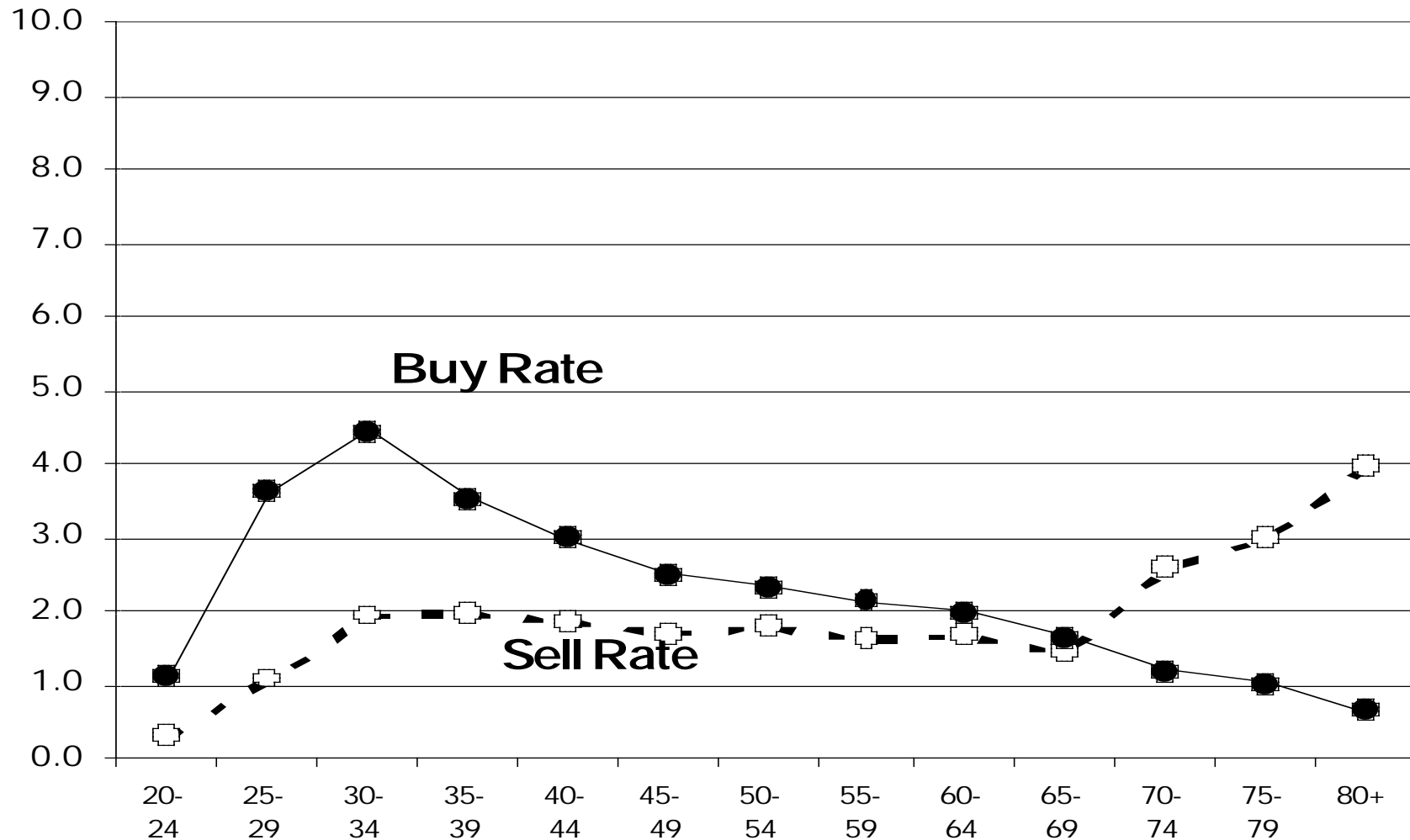
# Housing Type Choices of Seniors

<u>Housing Type</u>	<u>All Seniors</u>		<u>Senior Movers</u>
Detached	69%	→	35%
Attached	24%	→	54%
Owner	80%	→	41%

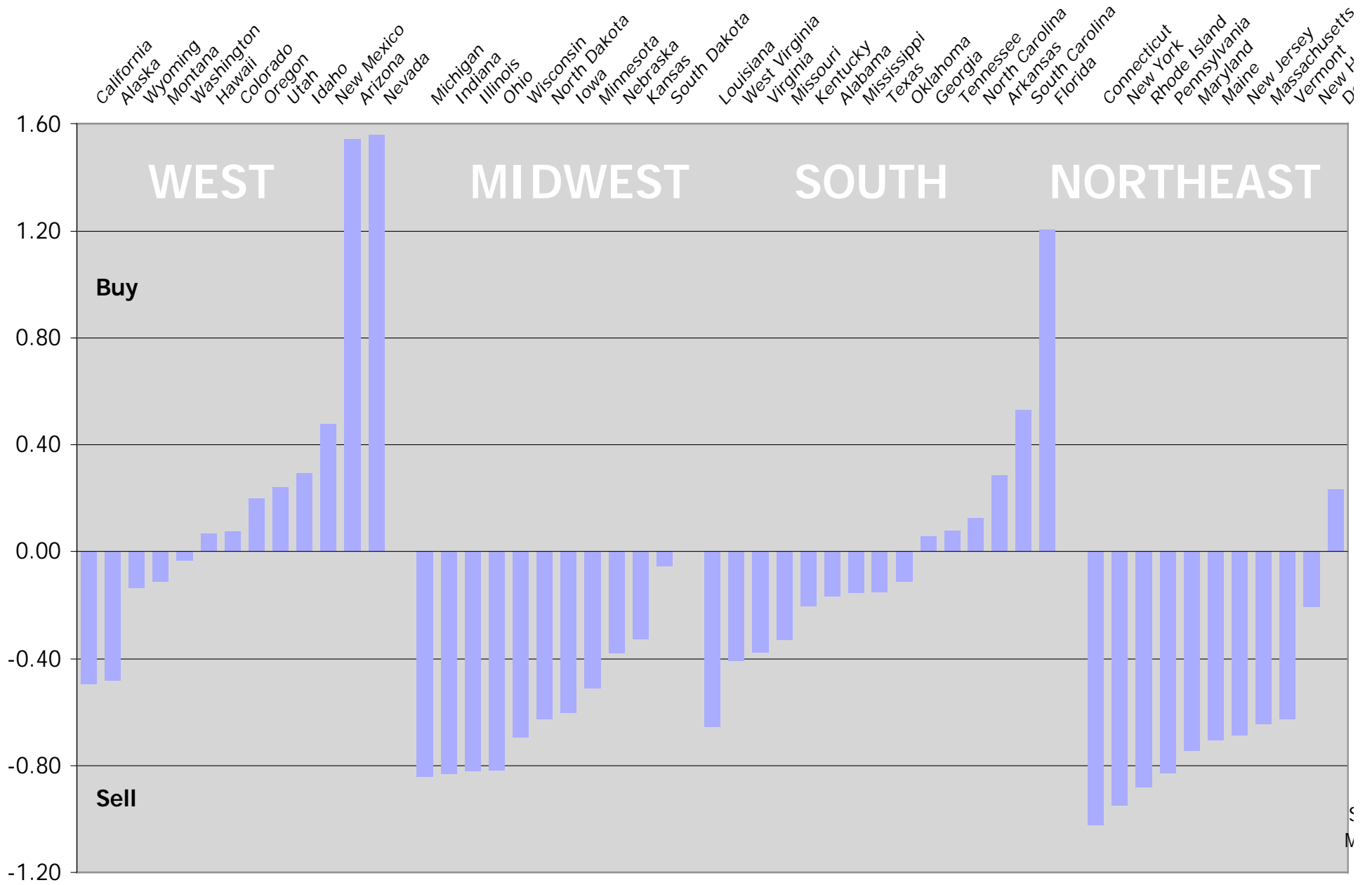
*Source: American Housing Survey 2003.* New movers means moved in past year. Annual senior movers are about 5% of all senior households; 75%+ of all senior will change housing type between ages 65 and 80.

# Buy-Sell Rates by Age Cohort

AHS



Source: Dowell Myers & SungHo Ryu, "Aging Baby Boomers and the Generational Housing Bubble: Foresight and Mitigation of an Epic Transition", *Journal of the American Planning Association* 74(1): 1-17 (2007).



Source: Dowell Myers & SungHo Ryu, "Aging Baby Boomers and the Generational Housing Bubble: Foresight and Mitigation of an Epic Transition", *Journal of the American Planning Association* 74(1): 1-17 (2007). Figures for net buying or selling rate age.

# Second-Home Market Overrated?

- Myth: Empty-nesters & seniors buy 2<sup>nd</sup> homes
- Fact: Only 4% of HH 65+ have second homes
- 70% of second home owners aged 35-64
- Detached new second home demand:

1990s = 900k

2000s = 600k

2010s = 300k

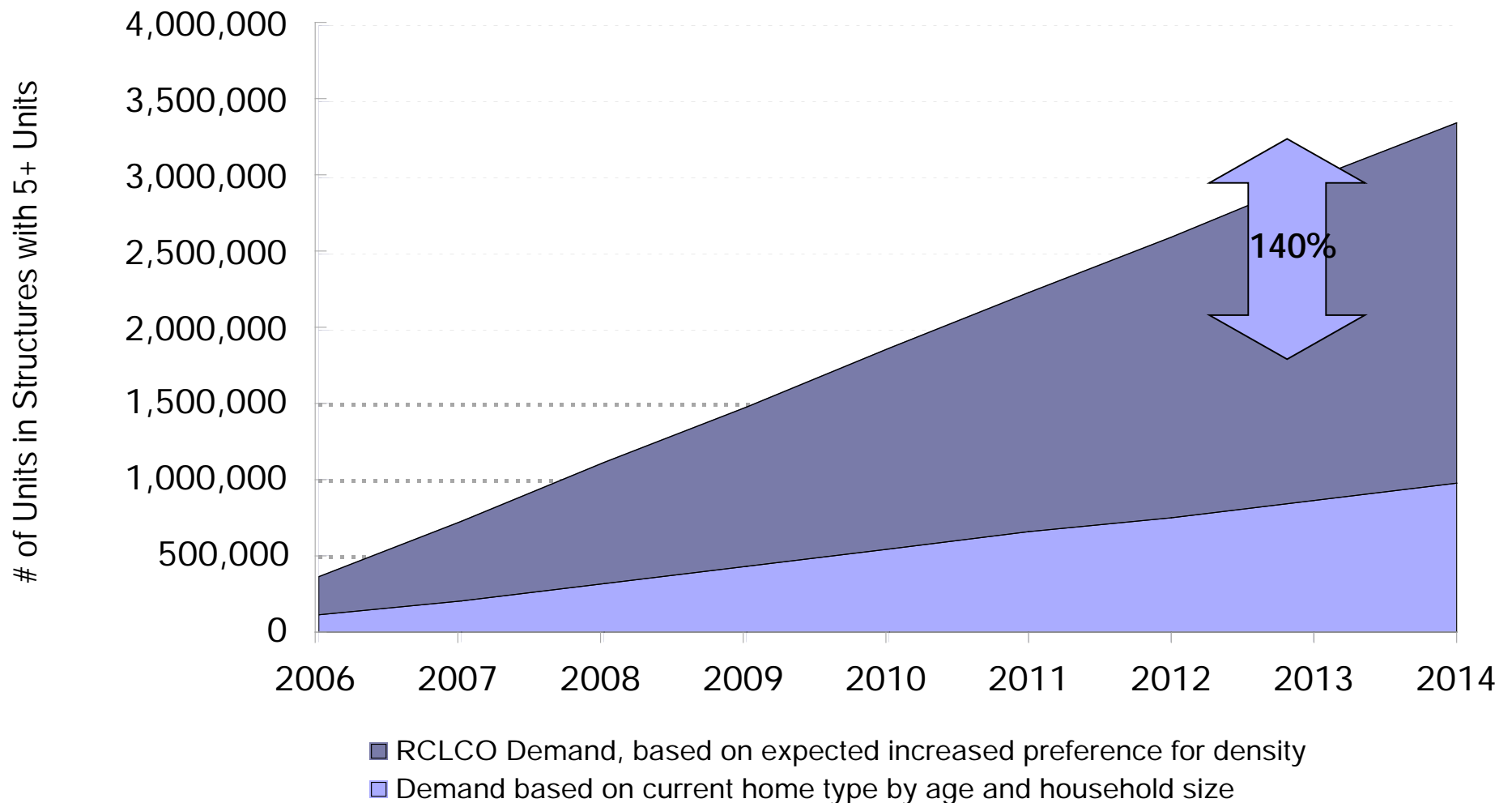
2020s = 200k

2030s = 100k

- Reality: Wealth used for children's homes

*Source:* Estimated by Arthur C. Nelson, Metropolitan Institute at Virginia Tech, from *American Housing Survey* and *Second Homes: What, How Many, Who and Where?* Harvard Joint Center for Housing (2001).

# Demographic Shift + Preference Shift = Higher Demand for Density



SOURCE: RCLCO Consumer Research

# Housing Preference Surveys by Type, 1995-2004

<u>Unit Type</u>	<u>Share</u>
Attached	38%
<i>Apartments</i>	14%
<i>Condos, Coops</i>	9%*
<i>Townhouses</i>	15%
Detached	62%
<i>Small Lot (&lt;7,000 sf)</i>	37%
<i>Large Lot (&gt;7,000 sf)</i>	<b>25%</b>

Source: **Low range** of surveys reviewed by Arthur C. Nelson, "Planning for a New Era," *Journal of the American Planning Association*, Fall 2006.

\*Toll Brothers shifting product mix to 15% condominium; *WSJ* 12/06.



# Trend Demand 2005 - 2040

50% Attached (apartment, TH, condo, etc.)

30% Detached small/cluster/zero-lot

20% Conventional large-lot subdivision

*80% = Traditional Urban Density*

*Even in Plano, Texas*





# *AND* Even in Rural Virginia

3/5/08

Dr. Nelson:

I'm writing for the Shenandoah Valley Business Journal.

I have a couple of questions regarding the housing market here in Harrisonburg and Rockingham County.

We're seeing some of (your) trends already. Realtors I've talked with say condominiums, townhouses and duplexes have continued to sell in the soft market of the past two years. Meanwhile, sales of detached homes are off.

What's behind this trend? Is it people's tastes? Is it what they can afford? Or both?

Dan Wright, business reporter  
Daily News-Record  
Harrisonburg, VA



# Large-Lot Oversupply 2030

<u>Unit Type</u>	<u>Supply 2005</u>	<u>Preference Change</u>	<u>Mid-Point Change</u>
Attached	39M	15M	13M
Small Lot	12M	40M	22M
Large Lot	58M	- 23M	- 3M

Large lots subdivided, redeveloped = 7M.

Figures in millions of units.

Preference change based on low-range of preference survey averages.

Mid-point is mid-percentage distribution between 2005 and low-range estimate of preference surveys and supply of occupied units in 2005.



# Unmet Smart Growth Demand

One-third of households want smart growth<sup>a</sup>

165M households in 2040 @ 33% = 55M

New housing demand 2000-2040 = 50M units

If all new dwelling units were “smart growth” new supply would not meet demand.

Next 100 million = 33% smart growth demand

<sup>a</sup>Gregg Logan, EPA Large-Production Builders Conference, January 31, 2007.



## Headlines: March 6, 2008

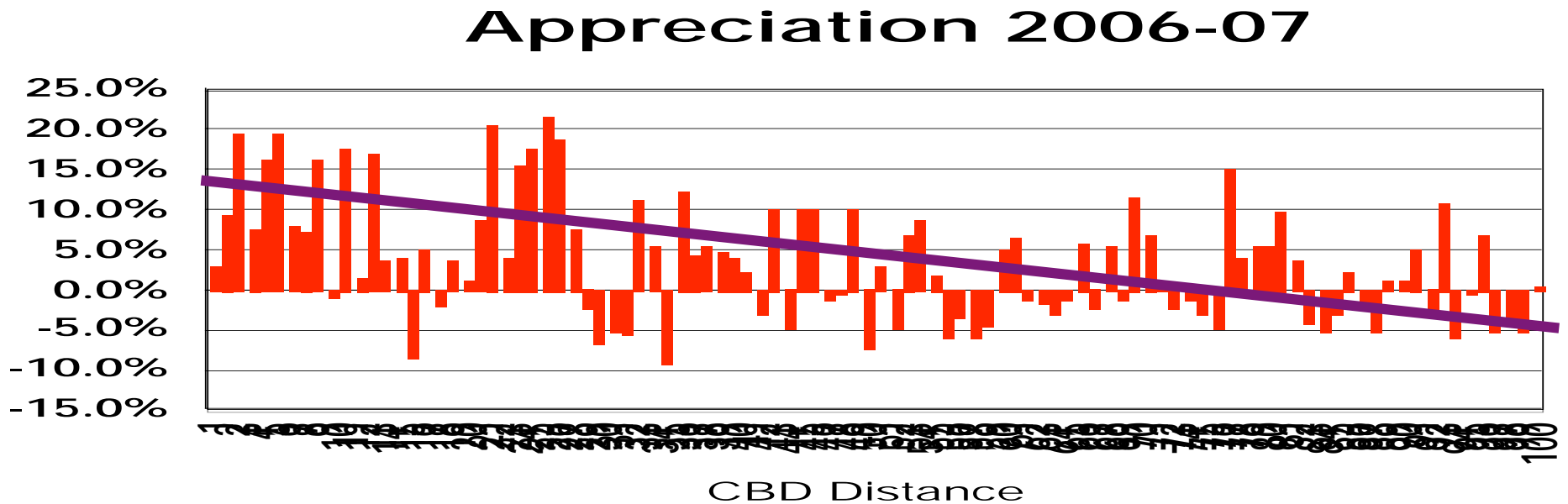
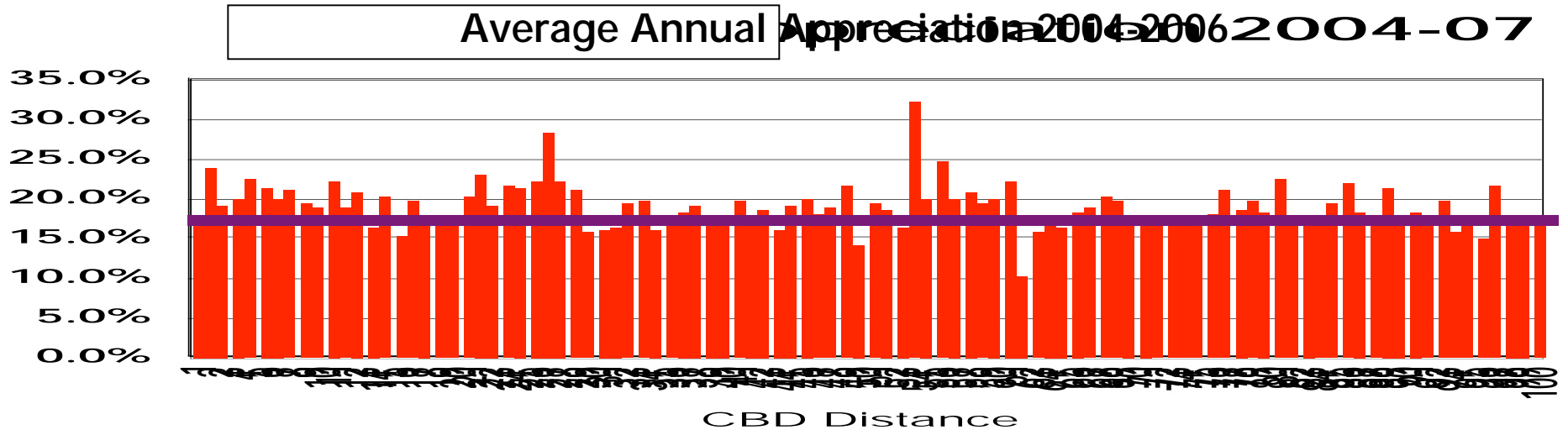
- Foreclosures hit all time high

*Mortgage Bankers Association*

- Americans' home equity below 50% for first time since 1945

*Federal Reserve Board*

# Fringe Values Eroding: Phoenix

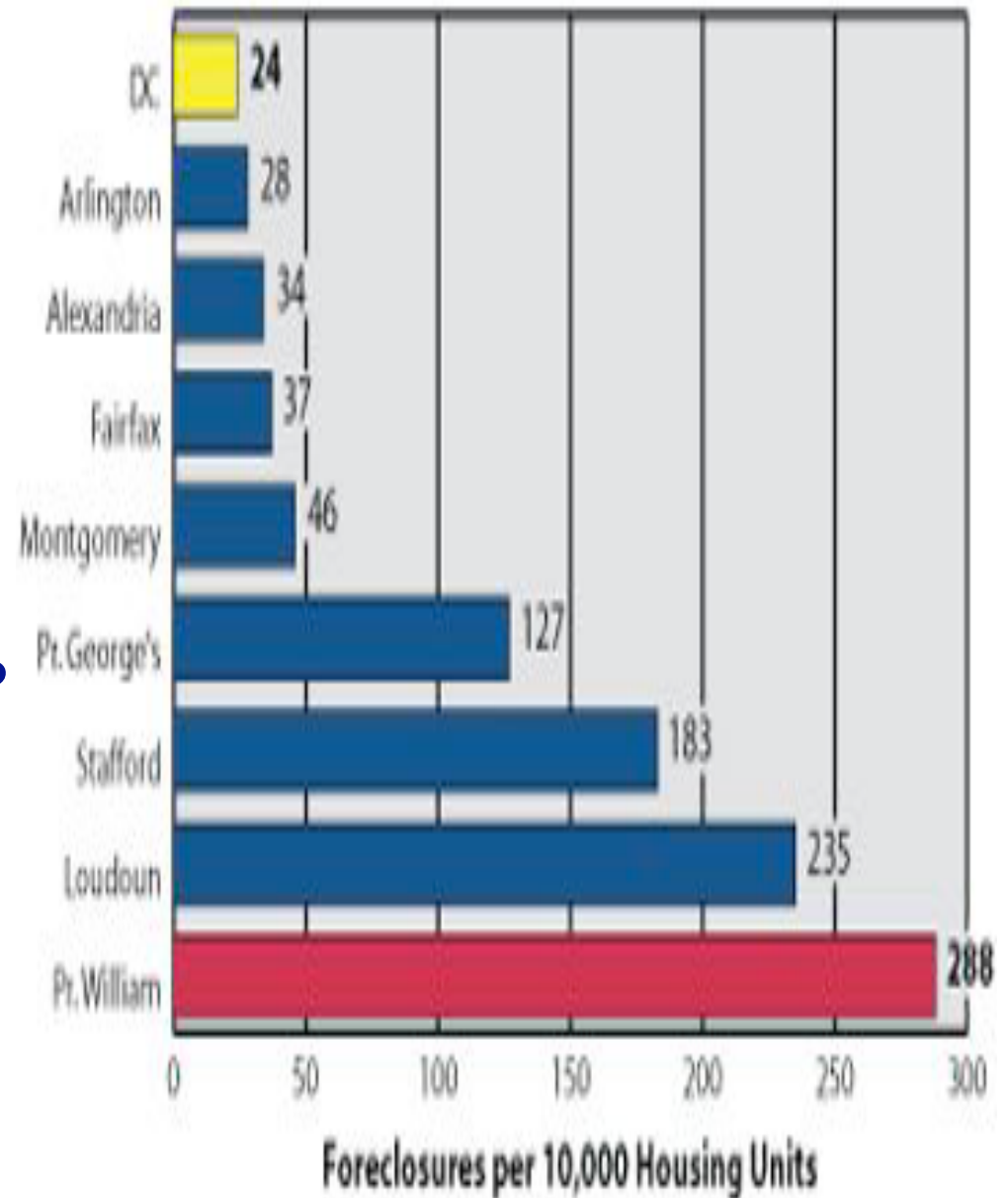


Source: Arthur C. Nelson, Metropolitan Institute based in Zillow analysis by Ceylan Oner.

# Fringe Foreclosure Pattern

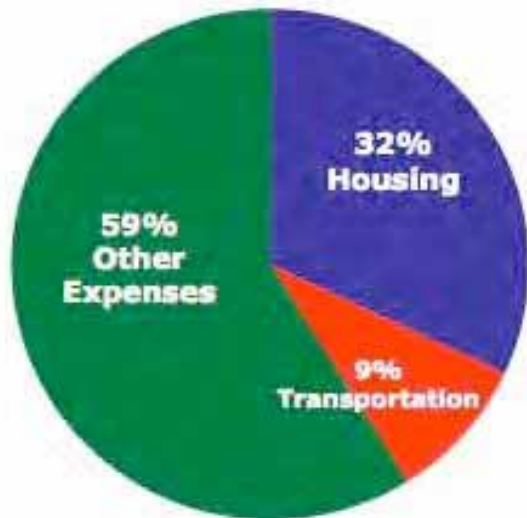
## DC Metro Foreclosure Reasons?

- Subprime meltdown?
- Over construction?
- Suburban devaluation?
- "Location" costs?



# Location Costs

FORECLOSURE  
RESILIENT  
Neighborhood



Family



FORECLOSURE  
RISKY  
Neighborhood

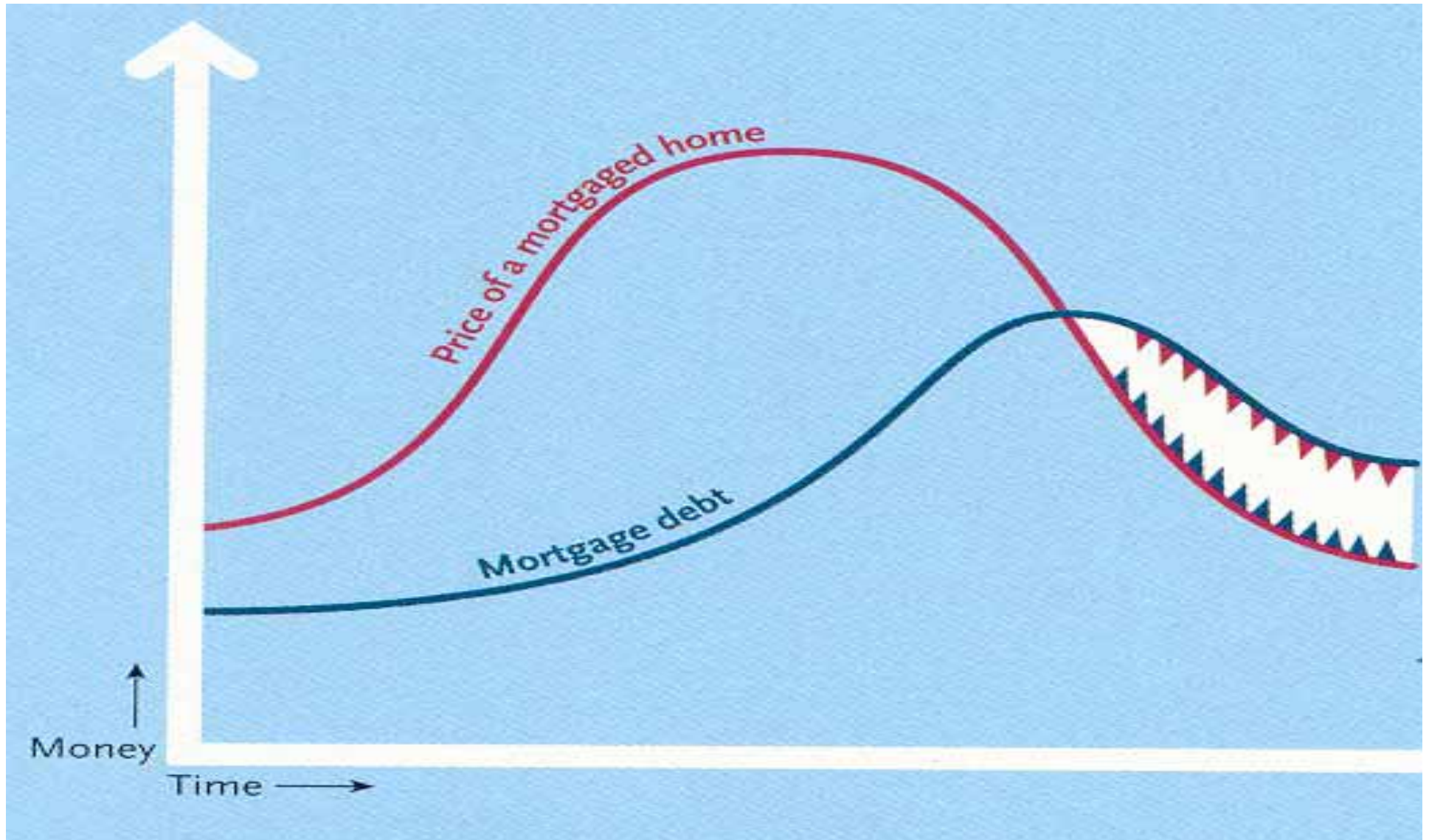


Source: Center for TOD Housing + Transportation Affordability Index, 2004 Bureau of Labor Statistics

Transit-rich areas reduce  
"location" costs making  
households more resilient  
to economic changes

"Drive until you qualify"  
mortgage underwriting  
bias increases  
foreclosure risks

# Fringe/Exurban Mortgage Time Bomb?



Source: Michael Hudson, "The New Road to Serfdom." *Harpers* (May 2006), p. 46. This graph depicts the total mortgage market as viewed by Hudson.





# Emerging Housing Realities

- Short-term housing production out of synch with long-term demand
- Growing demand for housing accessible to transit but transit supply is lagging
- Millions of homes at the fringe may soon not be worth their mortgages
- Detached second home demand falling every decade
- Inducing home-ownership may be harming millions



The New Promise Land?



# Tear Up a Parking Lot, Rebuild Paradise

Large, flat and well drained

Major infrastructure in place

4+ lane highway frontage → “transit-ready”

“*Kelo*” problems avoided

Committed to commercial/mixed use

Can turn NIMBYs into YIMBYs

Slide title phrase adapted from Joni Mitchell, *Big Yellow Taxi*, refrain: “Pave over paradise, put up a parking lot.”

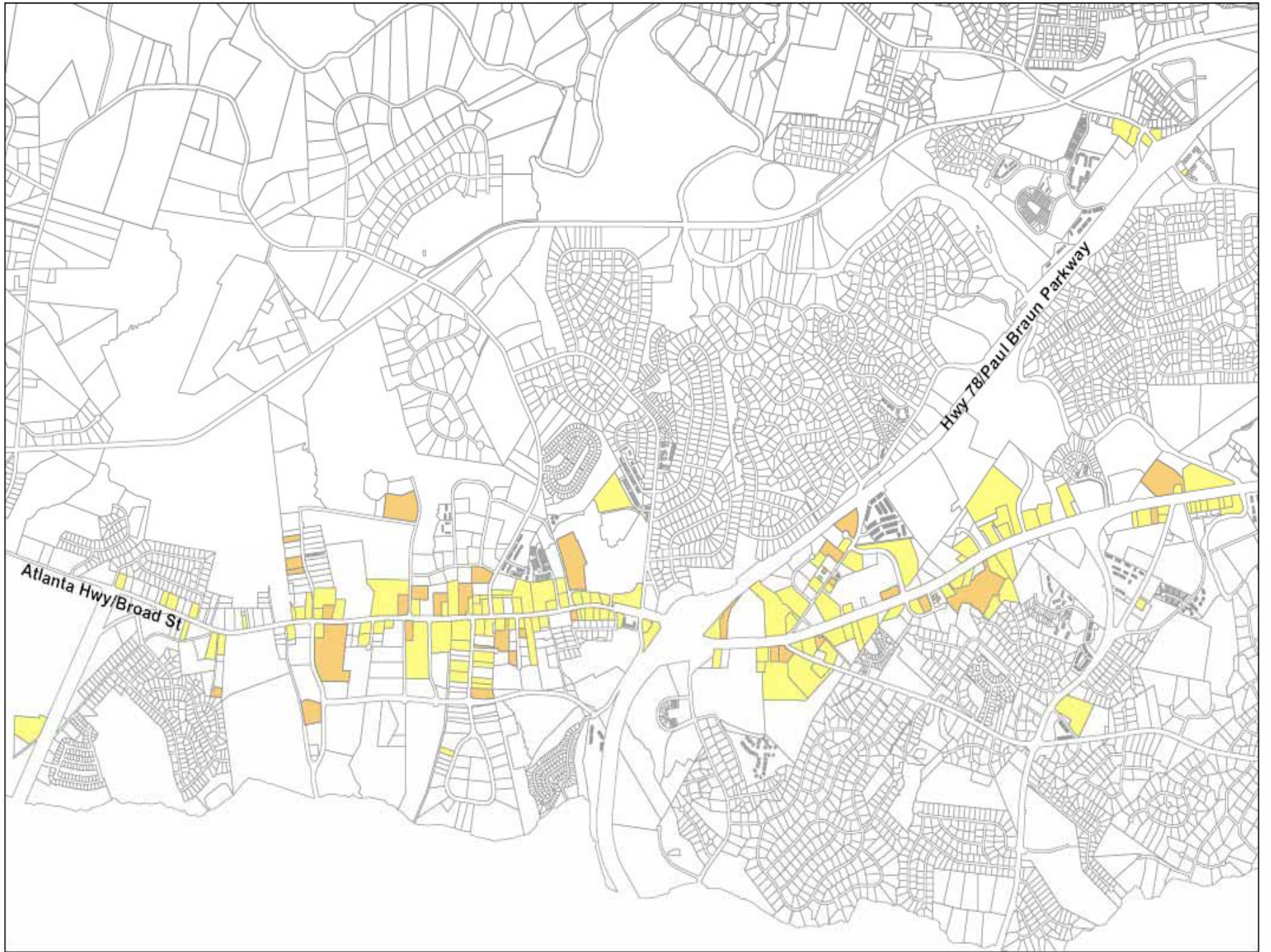


*Western Avenue at North Harvard Street: from auto-dominated strip retail to pedestrian-friendly Main Street.*



# Actions Needed

- Systematically evaluate low-FAR areas for their conversion ripeness over planning horizon
- Estimate share of growth conversion can accommodate feasibly
- Evaluate feasibility of creating transit corridors
- Engage stakeholders now to create “sector” and “form-based code” plans to grease the future
- Explore win-win financial tools to bridge near-term rate-of-return gap for long term gain







# Re-Building Capacity

## Calculation

## Result

"Ripe" Redevelopment Acres by 2040

6.0M

Minimum Share Redeveloped

25%

Redeveloped Acres

1.5M

15-25 dwellings @ 1,800sq.ft.

30-50 jobs @ 500sq.ft.

1.5FAR

Percent Residential Absorption

**min. 67%**

Percent Employment Absorption

**min. 75%**

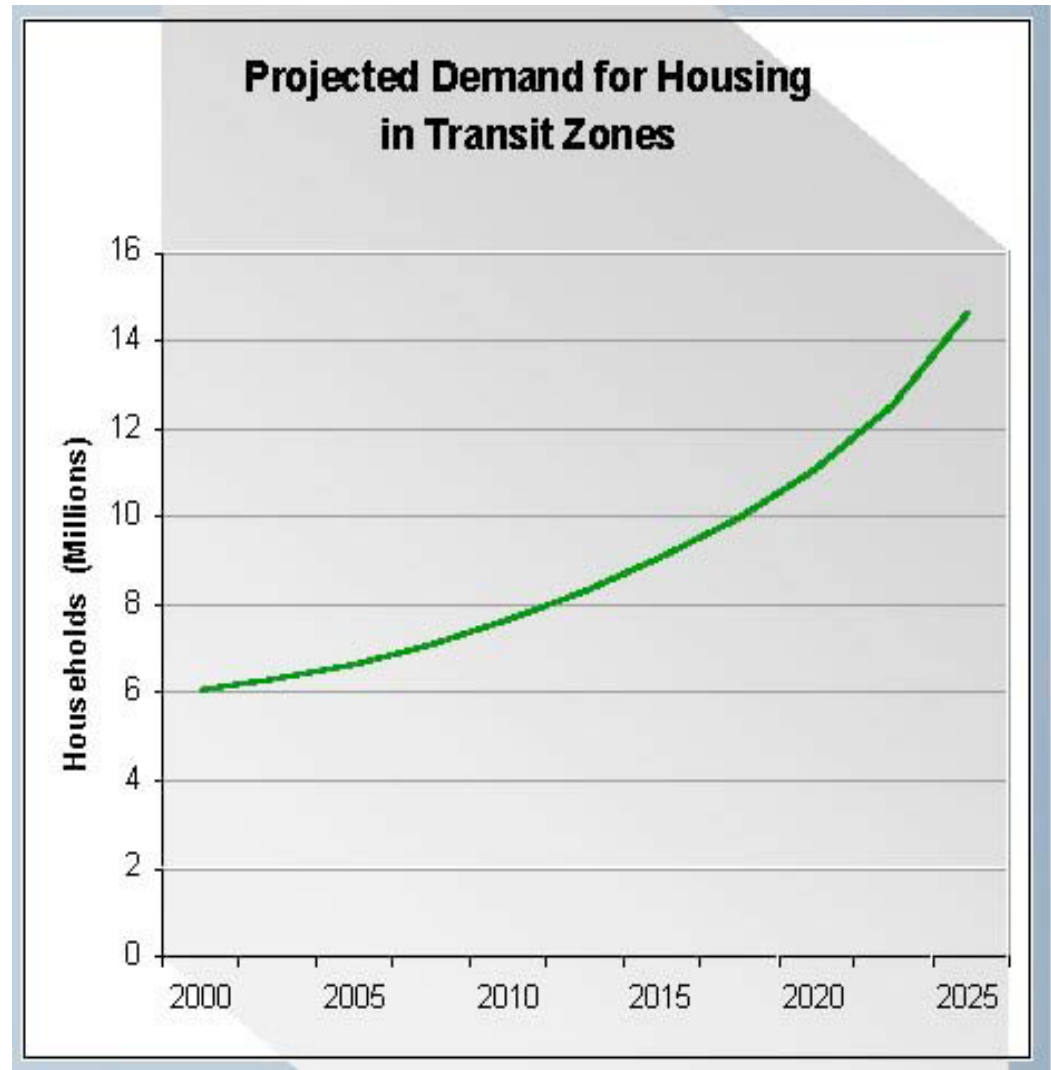


# Evolution of TOD Planning Area

- Old 1980s TOD planning area template
  - 10-minute walk =  $\frac{1}{2}$  mile = ~ 1,800 foot radius
  - 240 acre planning area
  - TOD plans often use 1,500 radius = 160 acres
- The walking reality
  - $\frac{1}{2}$ -mile 10 minute "walk in the park" @ 2mph
  - "Business" walk with a purpose @ 3mph
  - "New York" walk @ 3.9mph
- New TOD planning area template
  - $\frac{1}{2}$  mile design radius = 500 acre planning area
  - 1km coming into vogue = 800 acre planning area

# National TOD Opportunity

Rail transit accessed  
6M HH in 2000  
By 2025 existing &  
planned rail may  
access 15M HH  
By 2040 rail may  
access 30M HH  
60% of total new  
housing needed

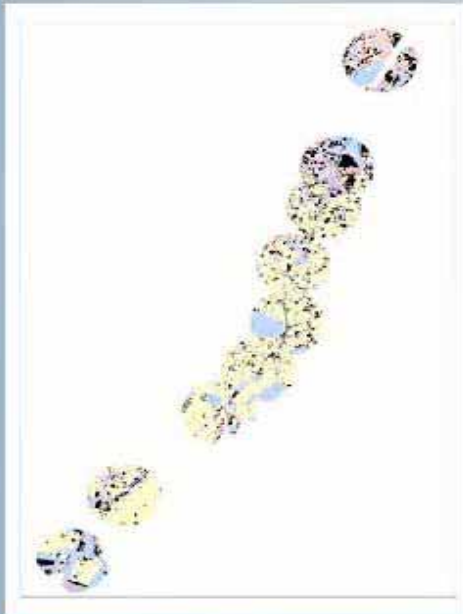


Source: Figure from Reconnecting America, *Realizing the Potential: Expanding Housing Opportunities Near Transit*.

# Re/Development Opportunity

## Underdeveloped Parcels in 1/2 Mile Station Areas (BLACK)

**Boston**  
Commuter Corridor  
Transit 1986, Future  
Expansion



**Minneapolis**  
Destination Connector  
Transit 2004



**Charlotte**  
Planned Growth Corridor  
Transit 2008



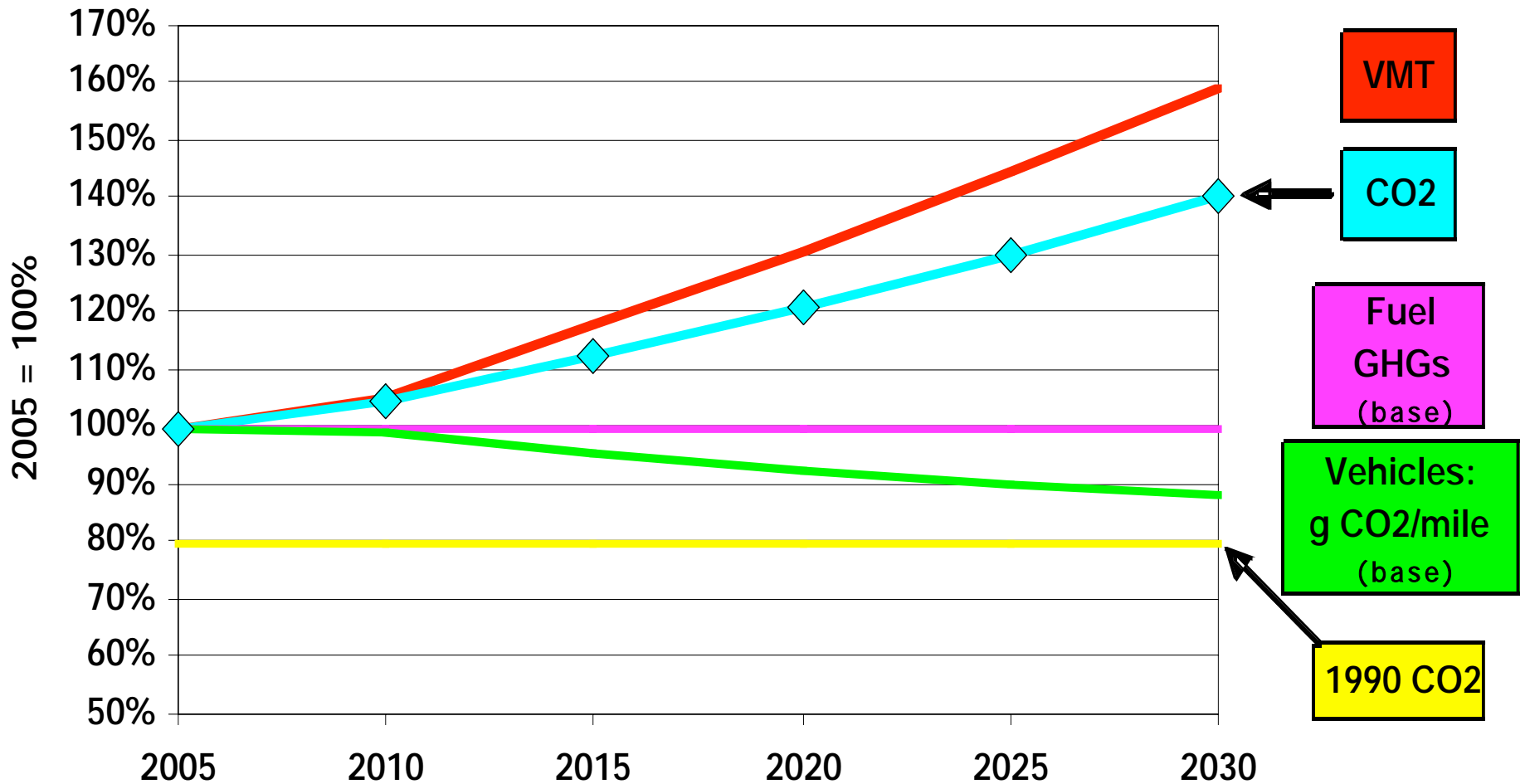
**Denver**  
Destination Connector  
Transit 2012



	Boston	Portland	Minneapolis	Charlotte	Denver
Total Stations in Corridor	9	38	17	15	11
Underutilized Acreage in 1/2M Radius of Each Station	345 acres	N/A	542 acres	1,295 acres	1,026 acres
"Ripe" for redevelopment by 2040		14,000	6,000	5,500	4,000
Metro growth absorbed @ 3.0 FAR		50%	35%	35%	20%

Source: Figure from Reconnecting America, *Realizing the Potential: Expanding Housing Opportunities Near Transit*.

# VMT Growth: 2005-2030

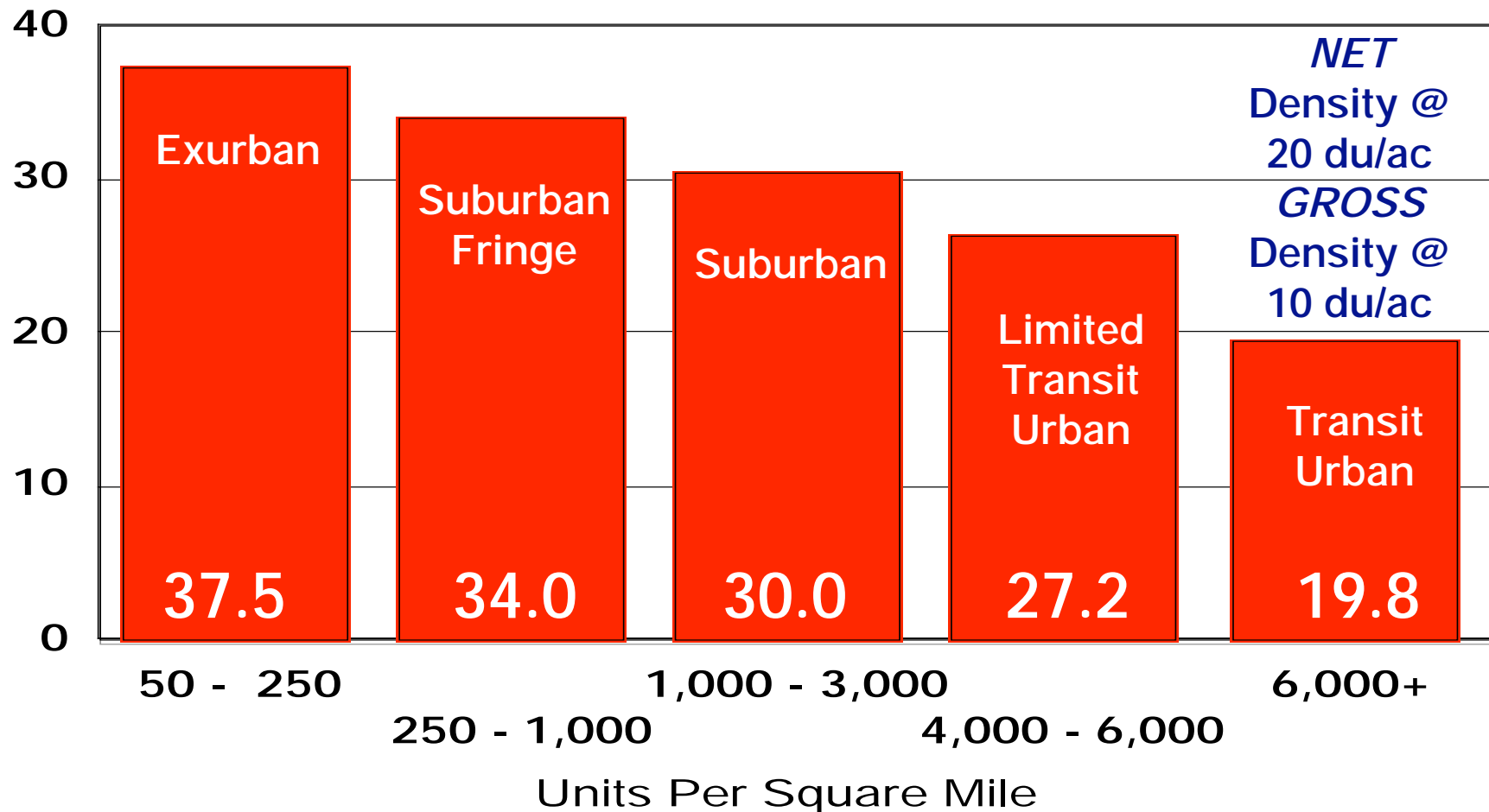


Data source: EIA AEO 2007



Source: Ewing et al. *Growing Cooler*, ULI 2008.

# Suburban Center + TOD Densities Offset VMT Gains of Growth



Source: Arthur C. Nelson, Metropolitan Institute at Virginia Tech, based on *Nationwide Household Transportation Survey*, USDOT, 2001. Figure is VMT per driver.

# Higher Density = Urban Heat Island?

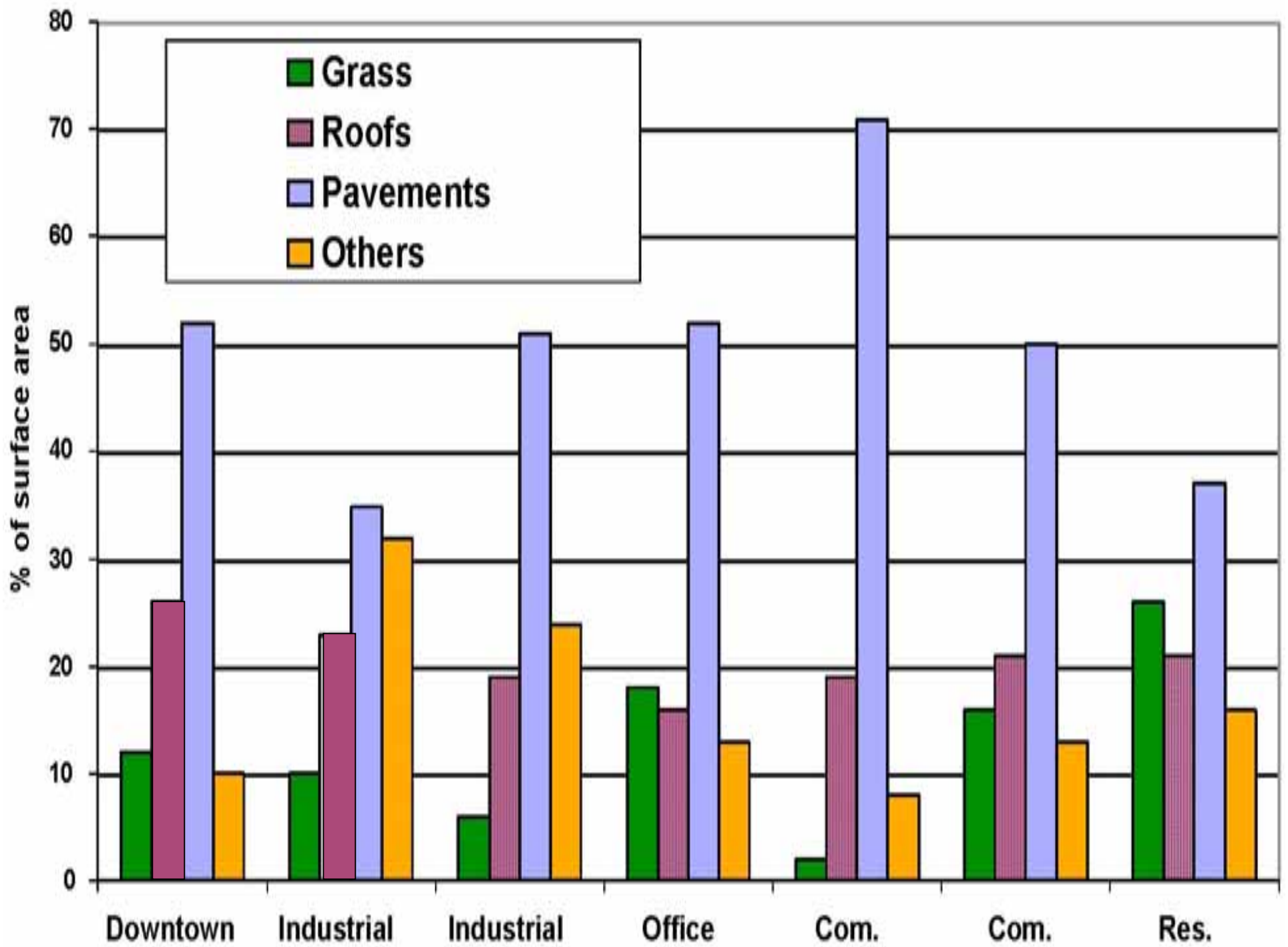
tween remotely-sensed surface temperature and that in near-surface air (Roth et al., 1989, p. 1713). In consideration of this finding, we believe that surface measurements provide a reliable basis for examining the interaction between urban design and elevations in both surface and near-surface air temperatures.

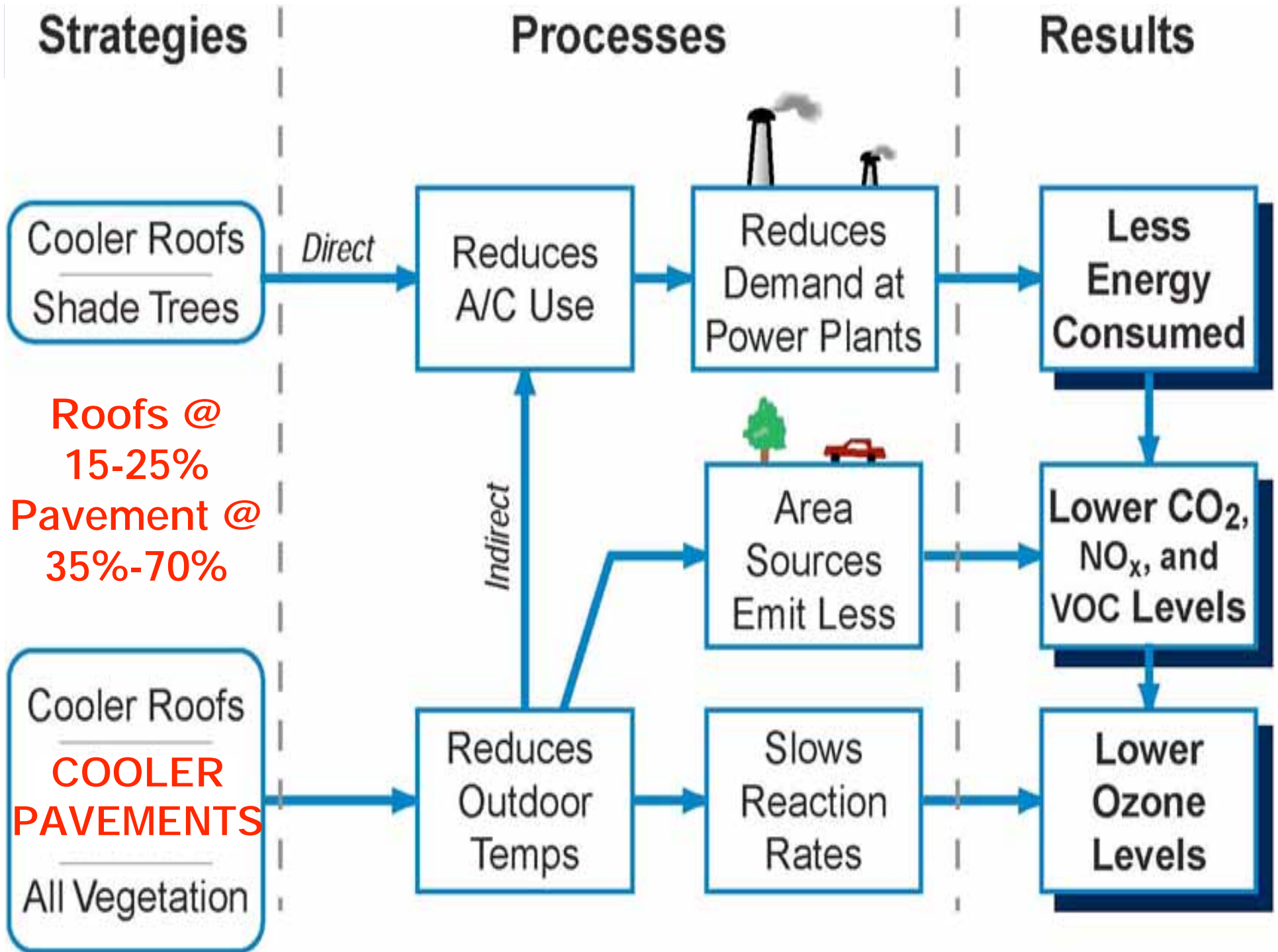
## The Implications of Urban Warming

Heat island formation can influence air quality through a number of mechanisms. Most directly, elevated atmospheric temperatures are known to facilitate the series of chemical reactions through which ozone is formed (Cardelino & Chameides, 1990). Toxic to humans at ground level, ozone inflames lung tissue and aggravates a range of respiratory ailments such as asthma.

the potential for ozone formation, by approximately 3% in urban temperature (1.7°C) is estimated to be roughly equivalent to replacing powered cars with electric vehicles.

In addition to its effect on air quality, urban warming indirectly affects air demand for air conditioning. In Los Angeles, as much as 15% of the electricity consumed is utilized for the so-called "cooling" effects of enhanced urban temperatures (Rosenfeld, 1996). The national cost of air conditioning is estimated to be approximately \$10 billion annually (Rosenfeld et al., 1996). In addition to the cost of air conditioning, the increased demand for air conditioning also increases the demand for electricity, which in turn increases the demand for fossil fuels, which in turn increases the demand for air conditioning.









# Urban Heat Island Strategies

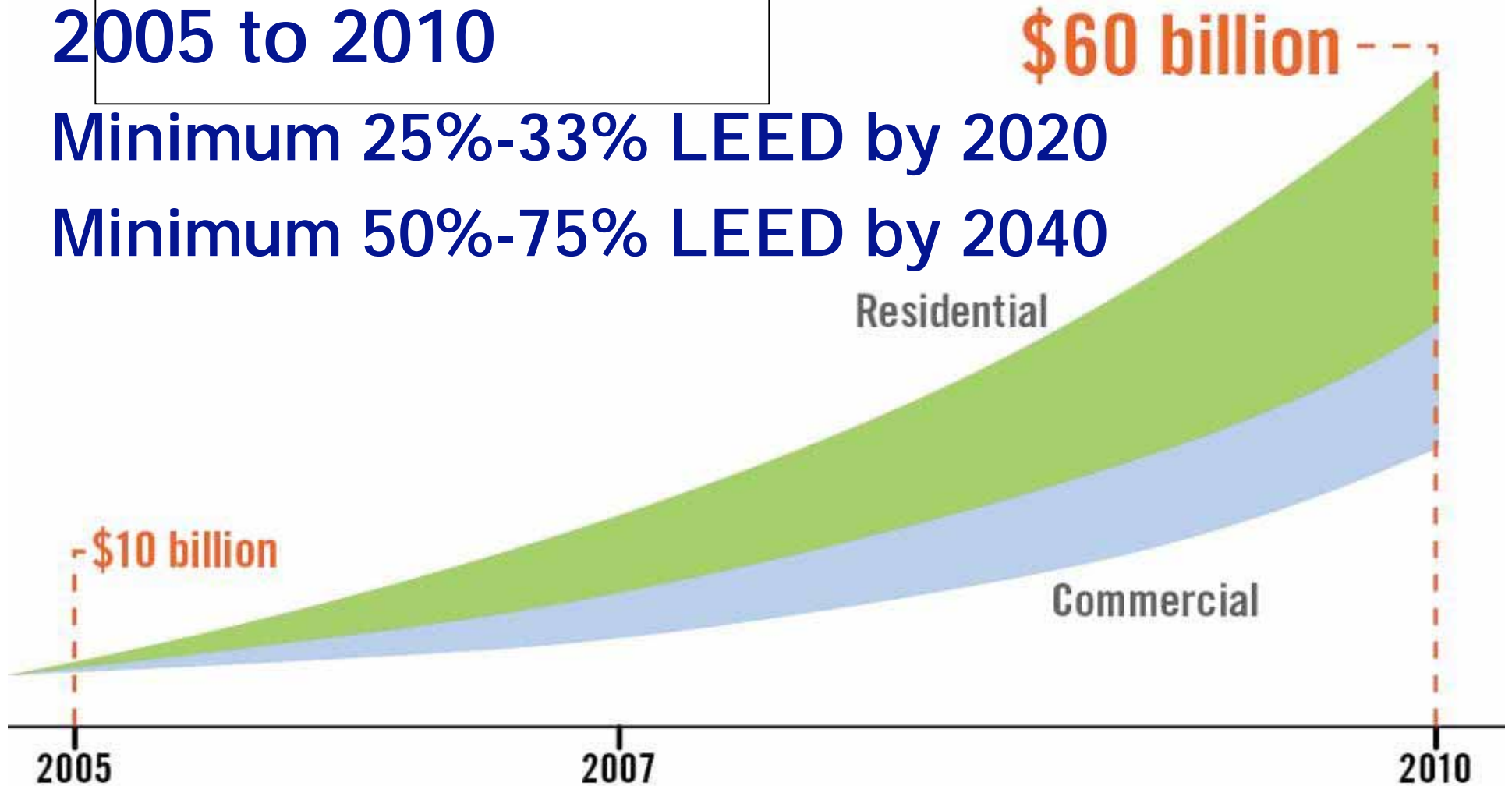
- High albedo-rated new roofs
- High albedo-rated reroofing (within 30 years)
- Pavements replaced in 20 years with high albedo concrete or asphalt additives
- Street trees placed strategically
- Building heat waste reduced → LEED program
- Emissions cut by enough to eliminate Ozone-inducing critical mass?

# Value of LEED Projects

2005 to 2010

Minimum 25%-33% LEED by 2020

Minimum 50%-75% LEED by 2040



Source: Figure from US Green Building Council, downloaded 3/4/08.



# The New Urban Economics

## ■ Old School

- People locate where jobs are
- The “employment-centric” model

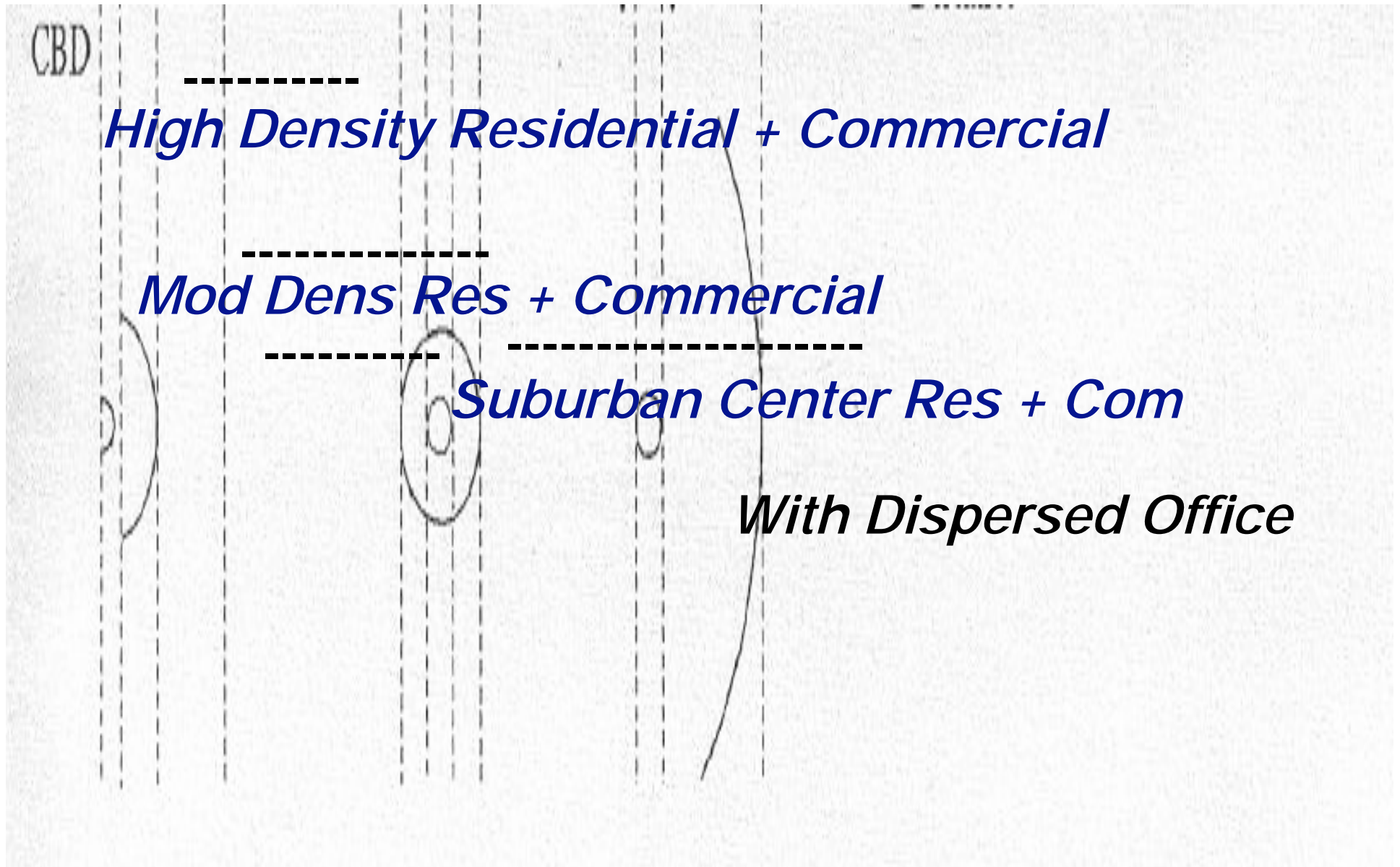
## ■ New School

- Jobs locate where people are
- The “homo-centric” model

## ■ The New Urban Economics

- Real estate development follows people
- *Where are people going? Toward Urbanity*

# The Old vs New Metropolitan Form





# Invest Where People Want to Be

- Half the population (NAR) and 70+% of seniors want transit options (AARP)
- ULI, PriceWaterhouseCoopers, others advise:
  - Do not invest in suburban fringe
  - Highest rates of return in redevelopment, infill
- Understand changing preferences →
  - Affluent elderly who want urbane opportunities
  - Growing number want to raise children in urbane settings
  - Longer life spans increase adult-oriented preferences
- 33% and growing share want “green” living in more dense urban/suburban areas



***THANK YOU!***



*Western Avenue at North Harvard Street: from auto-dominated strip retail to pedestrian-friendly Main Street.*

