Sustaining the Next 100 Million

Arthur C. (Christian) Nelson, Ph.D., FAICP
Director, Metropolitan Institute
Virginia Tech – Alexandria Center

Rocky Mountain Land Use Institute
March 6, 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 in plausible
- America can become more sustainable with the next 100 Millions Americans
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
  - Timely delivery of quality public services
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.

"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
THE NEXT REAL ESTATE BOOM

SHORT-TERM BUBBLE? MAYBE.
LONG-TERM OPPORTUNITY? DEFINITELY.
HOW THE HYPERGROWTH OF 10 "MEGAPOLITANS" IS STARTING A $25 TRILLION LAND GRAB.

PAGE 04
AMERICA CIRCA 2030

THE BOOM TO COME

230.3 billion square feet in 2000

337.2 billion square feet in 2030

106.8 billion new square feet

97.3 billion square feet from replacement
SHARE OF TOTAL GROWTH BY REGION, 2000–2030

- MIDWEST: 8.2 %
- NORTHEAST: 6.5 %
- SOUTH: 56 %
- WEST: 29.4 %
20th Century Metropolitan Form
21st Century Megapolitan Form
Dots indicate where residents of Polk worked in 2003

Source: Dwayne Guthrie, Metropolitan Institute at Virginia Tech, based on Longitudinal Employer-Household Dynamics, US Census Bureau.
Realms of the Sun Corridor
# Getting Ahead of the Curve

<table>
<thead>
<tr>
<th>US</th>
<th>2000</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>281 million</td>
<td>433 million</td>
</tr>
<tr>
<td>Housing Units</td>
<td>116 million</td>
<td>178 million</td>
</tr>
<tr>
<td>Jobs</td>
<td>166 million</td>
<td>249 million</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>US</th>
<th>2000 to 2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth-Related Units</td>
<td>50 million</td>
<td></td>
</tr>
<tr>
<td>Replaced Units</td>
<td>39 million*</td>
<td></td>
</tr>
<tr>
<td>Total Units</td>
<td>89 million</td>
<td></td>
</tr>
</tbody>
</table>

*Loss rate =~ 6% per decade compounded.*
<table>
<thead>
<tr>
<th>US</th>
<th>2000 to 2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth-Related Square Feet</td>
<td>33 billion</td>
</tr>
<tr>
<td>Replaced Square Feet</td>
<td>94 billion*</td>
</tr>
<tr>
<td>Total Square Feet</td>
<td>127 billion</td>
</tr>
</tbody>
</table>

*Loss rate =~ 24% per decade compounded.*
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
- Cabin fever increases trips in am, noon, pm.
- Cabin fever increases peak emissions with “cold” starts.
- Census “work at home” telecommuting indicator:
  
  \[
  1990 = 3.0\% \\
  2000 = 3.3\%
  \]
# Internet Retail Sales Growth Rate and Share Figures, 1998-2006

<table>
<thead>
<tr>
<th>Year</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>0.46%</td>
</tr>
<tr>
<td>1999</td>
<td>0.83%</td>
</tr>
<tr>
<td>2000</td>
<td>1.54%</td>
</tr>
<tr>
<td>2001</td>
<td>1.92%</td>
</tr>
<tr>
<td>2002</td>
<td>2.48%</td>
</tr>
<tr>
<td>2003</td>
<td>3.11%</td>
</tr>
<tr>
<td>2004</td>
<td>3.59%</td>
</tr>
<tr>
<td>2005</td>
<td>4.14%</td>
</tr>
<tr>
<td>2006</td>
<td>4.69%</td>
</tr>
</tbody>
</table>

*Source: Dept. of Commerce; analysis by Arthur C. Nelson*
Internet Retail Sales Growth Rate and Share, 1998-2006
### Retail Center Space Growth

<table>
<thead>
<tr>
<th>Year</th>
<th>GLA/Cap</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>14.7</td>
</tr>
<tr>
<td>1990</td>
<td>17.6</td>
</tr>
<tr>
<td>1995</td>
<td>18.9</td>
</tr>
<tr>
<td>2000</td>
<td>20.3</td>
</tr>
<tr>
<td>2005</td>
<td>20.5</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Space Class</th>
<th>1992</th>
<th>2003</th>
<th>%Dif</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total <em>Glamour</em> Space</td>
<td>145</td>
<td>149</td>
<td>+3%</td>
</tr>
<tr>
<td>Warehouse &amp; Storage</td>
<td>45</td>
<td>35</td>
<td>-23%</td>
</tr>
<tr>
<td>All Other</td>
<td>75</td>
<td>63</td>
<td>-16%</td>
</tr>
</tbody>
</table>

Non-percentage figures per capita based on Census estimates.

Bottom Line
New Construction 2000-2040

Construction

*Residential* $24 Trillion
*Nonresidential* $22 Trillion
*Infrastructure* $ 9 Trillion
*Total* $55 Trillion
How Does It Grow?
What is the Resale Market Telling Us?

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

<table>
<thead>
<tr>
<th>Region</th>
<th>SF%</th>
<th>CC%</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>-1.2%</td>
<td>1.9%</td>
</tr>
<tr>
<td>NE</td>
<td>2.4%</td>
<td>2.9%</td>
</tr>
<tr>
<td>MW</td>
<td>-3.2%</td>
<td>4.2%</td>
</tr>
<tr>
<td>S</td>
<td>-2.1%</td>
<td>0.8%</td>
</tr>
<tr>
<td>W</td>
<td>-1.5%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

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

“Traditional” Households on the Wane

<table>
<thead>
<tr>
<th>Household Type</th>
<th>1960</th>
<th>2000</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>HH with Children</td>
<td>48%</td>
<td>33%</td>
<td>27%</td>
</tr>
<tr>
<td>Single-Person HH</td>
<td>13%</td>
<td>27%</td>
<td>30%</td>
</tr>
</tbody>
</table>

*Source*: Census calculations by Arthur C. Nelson, Metropolitan Institute at Virginia Tech.
People Turning 65 Each Year

[Figures in 000s]

## Share of Growth 2000-2030

<table>
<thead>
<tr>
<th>HH Type</th>
<th>Share of Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>With children</td>
<td>13%</td>
</tr>
<tr>
<td>Without children</td>
<td>87%</td>
</tr>
<tr>
<td>Single-person</td>
<td>38%</td>
</tr>
</tbody>
</table>

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

# Unmet Walkable Demand

<table>
<thead>
<tr>
<th>Residential Form</th>
<th>Boston</th>
<th>Atlanta</th>
</tr>
</thead>
<tbody>
<tr>
<td>% want drivable suburbs</td>
<td>30%</td>
<td>41%</td>
</tr>
<tr>
<td>% of those who have</td>
<td>85%</td>
<td>95%</td>
</tr>
<tr>
<td>% want walkable suburbs</td>
<td>40%</td>
<td>29%</td>
</tr>
<tr>
<td>% of those who have</td>
<td>70%</td>
<td>35%</td>
</tr>
</tbody>
</table>

Unmet Smart Growth Demand

One-third of households want smart growth\(^a\)
165M households in 2040 @ 33% = demand for
55M smart growth homes
New housing demand 2000-2040 = 50M units
Even if all new residential units were “smart
growth” the new supply would fail to meet
demand.
Next 100 million = the 33% who want smart
growth now.

\(^a\)Gregg Logan, EPA Large-Production Builders Conference, January 31, 2007.
Demographic Shift + Preference Shift = Higher Demand for Density

RCLCO Demand, based on expected increased preference for density
Demand based on current home type by age and household size

SOURCE: RCLCO Consumer Research
Retired Location Preference

In a city          14%
In a suburb close to a city 37%
Total “urban”     51%
In a suburb away from a city 19%
In a rural community 30%

Suburbs away from cities are the losers

## Housing Type Choices of Seniors

<table>
<thead>
<tr>
<th>Housing Type</th>
<th>All Seniors</th>
<th>Senior Movers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detached</td>
<td>69%</td>
<td>35%</td>
</tr>
<tr>
<td>Attached</td>
<td>24%</td>
<td>54%</td>
</tr>
<tr>
<td>Owner</td>
<td>80%</td>
<td>41%</td>
</tr>
</tbody>
</table>

*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

Source: Dowell Myers, Univ. of Southern Cal., testing Nelson (2006) hypothesis.
## Housing Preference Surveys by Type, 1995-2004

<table>
<thead>
<tr>
<th>Unit Type</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attached</td>
<td>38%</td>
</tr>
<tr>
<td>Apartments</td>
<td>14%</td>
</tr>
<tr>
<td>Condos, Coops</td>
<td>9%*</td>
</tr>
<tr>
<td>Townhouses</td>
<td>15%</td>
</tr>
<tr>
<td>Detached</td>
<td>62%</td>
</tr>
<tr>
<td>Small Lot (&lt;7,000 sf)</td>
<td>37%</td>
</tr>
<tr>
<td>Large Lot (&gt;7,000 sf)</td>
<td>25%</td>
</tr>
</tbody>
</table>


*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
Home Ownership Bias Can Backfire

Headlines →
Buffalo “most affordable” metro in 2004. But …

Median Home Value in 1991 = $123,000
Median Home Value in 2005 = $ 85,000
Change, 2005 Dollars = -$ 38,000
Rate of Return Over Period = -31%

Source: Adapted from National Association of Home Builders, 2006. All figures in 2005 dollars.
Home Ownership Bias Can Backfire

Headlines →

Indianapolis “most affordable” metro in 2005. But …

Median Home Value in 1991 = $143,000
Median Home Value in 2005 = $125,000
Change, 2005 Dollars = -$ 20,000
Rate of Return Over Period = -13%

Source: Adapted from National Association of Home Builders, 2006. All figures in 2005 dollars.
Second-Home Market Overrated?

- Only 4% of HH 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

## Large-Lot Oversupply 2030

<table>
<thead>
<tr>
<th>Unit Type</th>
<th>Supply 2005</th>
<th>Preference Change</th>
<th>Mid-Point Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attached</td>
<td>39M</td>
<td>15M</td>
<td>13M</td>
</tr>
<tr>
<td>Small Lot</td>
<td>12M</td>
<td>40M</td>
<td>22M</td>
</tr>
<tr>
<td>Large Lot</td>
<td>58M</td>
<td>-23M</td>
<td>-3M</td>
</tr>
</tbody>
</table>

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.
Houston Housing Market Based on Demographic Trends, 2000-40

<table>
<thead>
<tr>
<th>Unit Type</th>
<th>Supply 2000</th>
<th>Total 2040</th>
<th>Change</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attached</td>
<td>370k</td>
<td>720k</td>
<td>350k</td>
<td>95%</td>
</tr>
<tr>
<td>Small Lot*</td>
<td>210k</td>
<td>360k</td>
<td>150k</td>
<td>70%</td>
</tr>
<tr>
<td>Large Lot**</td>
<td>200k</td>
<td>120k</td>
<td>-80k</td>
<td>-40%</td>
</tr>
<tr>
<td>Totals</td>
<td>780k</td>
<td>1.2M</td>
<td>420k</td>
<td>55%</td>
</tr>
</tbody>
</table>

*“Small lot” <7k square feet; estimate from American Housing Survey 1998.
**Up to 70k “large lot” homes may be subdivided, redeveloped.
Source: Arthur C. Nelson, Metropolitan Institute at Virginia Tech.
Phoenix Appreciation

Average Annual Appreciation 2004-2006

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

Appreciation 2006-07
DC Metro Foreclosures
4th Q 2007

Reasons?
- Subprime meltdown?
- Over construction?
- Suburban devaluation?
- “Highway robbery?”
Highway Robbery

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

- Long-term mismatch of short-term housing production
- Growing demand for housing accessible to transit but transit supply is lagging
- Large-lot homes may soon not be worth their mortgages
- Detached second home falling every decade
- Inducing home-ownership is already 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.”
## Re-Building Capacity

<table>
<thead>
<tr>
<th>Calculation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Ripe” Redevelopment Acres by 2040</td>
<td>6.0M</td>
</tr>
<tr>
<td>Percent Assumed Redeveloped</td>
<td>25%</td>
</tr>
<tr>
<td>Redeveloped Acres</td>
<td>1.5M</td>
</tr>
<tr>
<td>15-25 dwellings @ 1,800sq.ft.</td>
<td></td>
</tr>
<tr>
<td>30-50 jobs @ 500sq.ft.</td>
<td>1.5FAR</td>
</tr>
<tr>
<td>Percent Residential Absorption</td>
<td>min. 67%</td>
</tr>
<tr>
<td>Percent Employment Absorption</td>
<td>min. 75%</td>
</tr>
</tbody>
</table>
## Houston Parking Lot Opportunity

<table>
<thead>
<tr>
<th>Calculation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Low Intensity Acres ( (FAR &lt; 0.25) )</td>
<td>40,000</td>
</tr>
<tr>
<td>Assumed Percent Redeveloped</td>
<td>25%</td>
</tr>
<tr>
<td>Redeveloped Acres</td>
<td>10,000</td>
</tr>
<tr>
<td>( 25-35 \text{ du/ac} @ 1,500\text{sq.ft.} )</td>
<td></td>
</tr>
<tr>
<td>( 30-50 \text{ jobs/ac} @ 500\text{sq.ft.} )</td>
<td>1.5FAR</td>
</tr>
<tr>
<td>(3-4 floor, no parking decks, “smart” parking)</td>
<td></td>
</tr>
<tr>
<td>Residential Growth Absorption</td>
<td>Min.75%</td>
</tr>
<tr>
<td>Employment Growth Absorption</td>
<td>Min.50%</td>
</tr>
</tbody>
</table>
Actions Needed

Systematically evaluate existing low-intensity commercial areas for their conversion ripeness time-frame.

Assess redevelopment parameters, needs.

Evaluate feasibility of creating transit corridors out of existing commercial highways.

Engage stakeholders now; create “sector” and “form-based code” plans.

Explore win-win financial tools to bridge rate-of-return gap.
## Suburban Downtown Types

<table>
<thead>
<tr>
<th></th>
<th>Infill Setting</th>
<th>Greenfield Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Small</strong></td>
<td>With Rail</td>
<td>With Rail</td>
</tr>
<tr>
<td>Urban Village</td>
<td>TOD Village</td>
<td></td>
</tr>
<tr>
<td><strong>Large</strong></td>
<td>Without Rail</td>
<td>TOD High Rise</td>
</tr>
<tr>
<td>Urban Center</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Small</strong></td>
<td></td>
<td>Lifestyle Center</td>
</tr>
<tr>
<td>Main Street</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Large</strong></td>
<td></td>
<td>New Town Center</td>
</tr>
<tr>
<td>Suburban Center</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Metropolitan Institute at Virginia Tech
“Downtown” Plano, TX
Portland, Oregon Metro Area Rail Transportation Expansion Past-Present-Future

- Existing rail system & Extensions (solid lines-Year opened in parenthesis)
- Extensions in active planning (dotted lines, status in parenthesis)
- Clark County Light Rail - Proposed (hatched pale green lines, under study)
- Potential future rail rapid transit corridors (Hatched lines, unofficial or dormant plans)

Disclaimer: Not an official TriMet map. Alignments subject to change.

Key to numbered Entries on this Map:
1. Central City Streetcar (Opened 2001)
2. Eastside Streetcar (under study)
3. N. Macadam & Lake Oswego Streetcar (to be built in phases, under study)
4. Milwaukie-Clackamas MAX-Alignment (possible future MAX extension)

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Hillsboro, OR – “TOD Village”
Orenco Station “Green Field” Project

(c)2006 Andrew Hall, PortlandBridges.com
Re/Development Opportunity
Underdeveloped Parcels in ½ 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

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

Total Stations in Corridor
Boston 9
Portland 38
Minneapolis 17
Charlotte 15
Denver 11

Underutilized Acreage in 1/2M Radius of Each Station
345 acres
N/A
542 acres
1,295 acres
1,026 acres

Acres “ripe” for redevelopment by 2040 (est)
6,000
5,500
4,000

Share of metro growth absorbed @ 3.0 FAR
35%
35%
20%
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.

This is 60% of total new housing needed.

Source: Figure from Reconnecting America, Realizing the Potential: Expanding Housing Opportunities Near Transit.
VMT Growth: 2005-2030

Data source: EIA AEO 2007

If California Standards Adopted

Based on EIA and CARB data

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.
Sketch of an Urban Heat Island Profile

Strategies

- Cooler Roofs
- Shade Trees
- Cooler Pavements
- All Vegetation

Processes

- Direct
  - Reduces A/C Use
  - Reduces Demand at Power Plants

- Indirect
  - Area Sources Emit Less
  - Slows Reaction Rates
  - Lower CO₂, NOₓ, and VOC Levels
  - Lower Ozone Levels

Results

- Less Energy Consumed
Urban Heat Island Strategies

- High albedo-rated new roofs
- High albedo-rated refoofing (within 30 years)
- Pavements replaced within 20 years; high albedo concrete or asphalt additives
- Street trees added strategically
- Building heat waste reduced $\rightarrow$ LEED approach
- CO$_2$ emissions cut by 15%-25%
- Ozone-inducing critical mass eliminated?
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 New Metropolitan Form?

- Dense Residential + Commercial
- Mod Dens Res + Commercial
- Suburban Center Res + Com
- Outlying manufacturing and distribution centers
- Outlying commercial centers
- Residential
- Light manufacturing

CBD

Distance
Invest Where the People Will Be

- 71% of elderly want transit options (AARP)
- 50% want expanded transit investment (NAR)
- Large-scale home builders want transit options
- 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
  - Young professions who delay child-rearing
  - Some shifting preferences even in families with children
The Sustainable 100M

- No net increase in VMT
- No net increase in water consumption
- No net increase in energy consumption
- No further expansion of the suburban fringe
- Reduction in urban heat island
- Increased economic interaction as retail & service thresholds increased

The challenge is to reduce the footprint of the current 300M
THANK YOU!