MEGA TRENDS

This too shall pass ....

Arthur C. Nelson, Ph.D., FAICP
Presidential Professor &
Director of Metropolitan Research
University of Utah

National Ready-Mix Concrete Association
March 16, 2009
Themes

- America’s growth is resilient
- Current housing “problem”
- Profound demographic changes
- Most growth will be redevelopment
- Special role of “sustainable” building materials like concrete
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 Research, University of Utah.
THE BOOM TO COME

AMERICA CIRCA 2030

- 337.2 billion square feet in 2030
- 230.3 billion square feet in 2000
- 106.8 billion new square feet
- 97.3 billion square feet from replacement

2000 - 2030
<table>
<thead>
<tr>
<th>Year</th>
<th>Demand</th>
<th>Supply</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>1,495k</td>
<td>1,603k</td>
<td>108k</td>
</tr>
<tr>
<td>2002</td>
<td>1,440k</td>
<td>1,705k</td>
<td>373k</td>
</tr>
<tr>
<td>2003</td>
<td>1,353k</td>
<td>1,848k</td>
<td>868k</td>
</tr>
<tr>
<td>2004</td>
<td>1,432k</td>
<td>1,956k</td>
<td>1,391k</td>
</tr>
<tr>
<td>2005</td>
<td>1,418k</td>
<td>2,068k</td>
<td>2,041k</td>
</tr>
<tr>
<td>2006</td>
<td>1,485k</td>
<td>1,801k</td>
<td>2,357k</td>
</tr>
<tr>
<td>2007</td>
<td>1,491k</td>
<td>1,355k</td>
<td>2,221k</td>
</tr>
<tr>
<td>2008</td>
<td>1,532k</td>
<td>906k</td>
<td>1,595k</td>
</tr>
<tr>
<td>2009</td>
<td>1,552k</td>
<td>600k</td>
<td>644k</td>
</tr>
<tr>
<td>2010</td>
<td>1,566k</td>
<td>900k</td>
<td>(22k)</td>
</tr>
</tbody>
</table>

Source: Arthur C. Nelson, Presidential Professor & Director of Metropolitan Research, University of Utah.
Squeezing Out the Excess

Source: Arthur C. Nelson, Presidential Professor & Director of Metropolitan Research, University of Utah.
### Getting Ahead of the Curve

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>296 million</td>
<td>433 million</td>
</tr>
<tr>
<td>Housing Units</td>
<td>122 million</td>
<td>179 million</td>
</tr>
<tr>
<td>Jobs</td>
<td>156 million</td>
<td>272 million</td>
</tr>
</tbody>
</table>

*Source: Arthur C. Nelson, Presidential Professor & Director of Metropolitan Research, University of Utah.*
# Residential Development

<table>
<thead>
<tr>
<th>US</th>
<th>2000 to 2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth-Related Units</td>
<td>65 million</td>
</tr>
<tr>
<td>Replaced Units</td>
<td>38 million</td>
</tr>
<tr>
<td>Total Units</td>
<td>93 million</td>
</tr>
</tbody>
</table>

*Source: Arthur C. Nelson, Presidential Professor & Director of Metropolitan Research, University of Utah.*
## Nonresidential Development

<table>
<thead>
<tr>
<th></th>
<th>2000 to 2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth-Related Square Feet</td>
<td>35 billion</td>
</tr>
<tr>
<td>Replaced Square Feet</td>
<td>102 billion</td>
</tr>
<tr>
<td>Total Square Feet</td>
<td>137 billion</td>
</tr>
</tbody>
</table>

*Source: Arthur C. Nelson, Presidential Professor & Director of Metropolitan Research, University of Utah.*
Life-Span of Building Function

Source: Arthur C. Nelson, Presidential Professor & Director of Metropolitan Research, University of Utah, based on DoE Commercial Buildings Energy Consumption Survey.
Bottom Line Construction
2005-2040

US

Residential  $34 Trillion
Nonresidential  $14 Trillion
Infrastructure  $9 Trillion
Total  $57 Trillion

Source: Arthur C. Nelson, Presidential Professor & Director of Metropolitan Research, University of Utah.
How Does It Grow?
Market Analysts Finding Changing Preferences

- National Association of Realtors
- National Association of Home Builders
- Nationally Recognized Market Analysts
- Urban Land Institute
- Lend Lease/PriceWaterhouseCoopers
- Joint Center for Housing Policy at Harvard

Golfing Buddies and Taxi Drivers
# Residential Resale Indicators

<table>
<thead>
<tr>
<th>Year</th>
<th>SF+TH</th>
<th>Condo/Coop</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>$221,900</td>
<td>$221,900</td>
</tr>
<tr>
<td>2007</td>
<td>$217,900</td>
<td>$226,300</td>
</tr>
<tr>
<td>2008</td>
<td>$197,100</td>
<td>$210,000</td>
</tr>
</tbody>
</table>

Change: -11.2%  -3.3%

Source: Arthur C. Nelson, Presidential Professor & Director of Metropolitan Research, University of Utah, adapted from National Association of Realtors monthly resale data accessed December 14, 2008. Figures are median resale prices.
Households are Changing

<table>
<thead>
<tr>
<th>Household Type</th>
<th>1960</th>
<th>2005</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>HH with Children</td>
<td>48%</td>
<td>32%</td>
<td>26%</td>
</tr>
<tr>
<td>HH without Children</td>
<td>52%</td>
<td>68%</td>
<td>74%</td>
</tr>
<tr>
<td>Single/Other HH</td>
<td>13%</td>
<td>31%</td>
<td>34%</td>
</tr>
</tbody>
</table>

*Source: Arthur C. Nelson, Presidential Professor & Director of Metropolitan Research, University of Utah.*
People Turning 65 Each Year

[Figures in 000s]

What Futurists Tell Us

Bio-medical advances extend lifetimes. Insurance actuarial tables extend to 120. Another 20 years added – minimum. Adulthood mostly after child-rearing.
Retired Location Preference

City or suburb close to a city 51%
Suburb away from a city 19%
Rural community 30%

Conventional suburbs away from cities are the least desirable for this group.

Source: Adapted from National Association of Realtors & Smart Growth America, National Community Preference Survey 2004.
Buy-Sell Rates by Age Cohort

Relocation Choices of Seniors

<table>
<thead>
<tr>
<th>Housing Type</th>
<th>Before Move</th>
<th>After Move</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attached</td>
<td>24%</td>
<td>54%</td>
</tr>
<tr>
<td>Renter</td>
<td>20%</td>
<td>59%</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 seniors will change housing type between ages 65 and 80.
Emerging “Urbanity” Preferences

Unmet *Walkable* Demand

<table>
<thead>
<tr>
<th>Residential Form</th>
<th>Boston</th>
<th>Atlanta</th>
</tr>
</thead>
<tbody>
<tr>
<td>% who get the walkable suburbs they want</td>
<td>70%</td>
<td>35%</td>
</tr>
</tbody>
</table>

More Recent Surveys

Susan Handy et al. (*JAPA* 2008)

42% to 59% of all households want “new urbanity” neighborhood characteristics.
### Share of Growth 2000-2040

<table>
<thead>
<tr>
<th>US HH Type</th>
<th>Growth</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>HH Growth</td>
<td>54M</td>
<td></td>
</tr>
<tr>
<td>With children</td>
<td>7M</td>
<td>14%</td>
</tr>
<tr>
<td>Without children</td>
<td>47M</td>
<td>86%</td>
</tr>
<tr>
<td><strong>Single/Other</strong></td>
<td>16M</td>
<td>30%</td>
</tr>
</tbody>
</table>

*New single-person HHs double new HHs with children.*

**Source:** Arthur C. Nelson, Presidential Professor & Director of Metropolitan Research, University of Utah.
Fringe Values Eroding: Phoenix

Source: Arthur C. Nelson, Presidential Professor & Director of Metropolitan Research, University of Utah, based in Zillow analysis by Ceylan Oner.
Fringe Foreclosure Pattern

DC Metro
Subprime
Oversupply
Devaluation
Energy prices

Metro Rail Access

Source: Arthur C. Nelson, Presidential Professor & Director of Metropolitan Research, University of Utah.
U.S. homes lost $2 trillion in value in '08

Les Christie, CNNMoney.com staff writer. Dec. 15, 2008: 11:02 AM ET
Home Ownership Rate Falling?

- Sub-prime “meltdown”.
- Private underwriting tighter.
- New regulations will tighten underwriting more.
- Many financially savvy people are renters.
- Renting provides mobility for jobs.
  - Some Gen-X & Gen-Y attitudes different?
- Upscale rental communities attractive to more middle/affluent/upper incomes.
# Shifting Tenure Implications

<table>
<thead>
<tr>
<th>Year</th>
<th>Units</th>
<th>%Owner</th>
<th>Owner</th>
<th>Renter</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>125M</td>
<td>67%</td>
<td>84M</td>
<td>41M</td>
</tr>
<tr>
<td>2015</td>
<td>134M</td>
<td>65%</td>
<td>87M</td>
<td>47M</td>
</tr>
<tr>
<td>Change</td>
<td>9M</td>
<td></td>
<td>3M</td>
<td>6M</td>
</tr>
<tr>
<td>Share</td>
<td></td>
<td>37%</td>
<td>63%</td>
<td></td>
</tr>
</tbody>
</table>

Units are “year-round” and include occupied, vacant, transitional, and other units meant for year-round occupancy. Figure for 2008 estimated from *American Housing Survey for the United States 2007*.

*Source: Arthur C. Nelson, Presidential Professor & Director of Metropolitan Research, University of Utah.*
The New Promised Land?
Tear Up a Parking Lot, Rebuild Paradise

Large, flat and well drained
Single, profit-motivated ownership
Major infrastructure in place
4+ lane highway frontage → “transit-ready”
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>Minimum Share 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>

Source: Arthur C. Nelson, Presidential Professor & Director of Metropolitan Research, University of Utah.
Sketch of an Urban Heat-Island Profile

Late Afternoon Temperature

- Rural
- Commercial
- Urban Residential
- Suburban Residential
- Downtown
- Park
- Rural Farmland
Albedo (Reflection) Properties

- Corrugated Roof: 0.10-0.15
- Colored Paint: 0.15-0.35
- Trees: 0.15-0.18
- Grass: 0.25-0.30
- Asphalt: 0.05-0.20
- Highly Reflective Roof: 0.60-0.70
- White Paint: 0.50-0.90
- Brick/Stone: 0.20-0.40
- Red/Brown Tile: 0.10-0.35
- Concrete: 0.25-0.70

Source: American Concrete Pavement Association
Sustainability Advantages

Source: American Concrete Pavement Association
Urban Heat Island Reduction

Heat / Energy is Absorbed into Black Surface

Heat / Energy is Reflected by Whiter Surface

20° F less
Never Waste a Crisis

- A “concrete” action plan.
- Substantially reduce urban heat island in 20 years.
- Stimulate construction of sustainable and green buildings.
- Re-engineer the $1 trillion building construction economy.
- Let’s be a little aggressive, for a change.
- Specific elements …
Concrete Action Plan 1

Change building codes, zoning ordinances, subdivision codes, and other development permits to require only:

*High albedo roof products*

*High albedo concrete surfaces*

With markets down, now is the time to position ourselves for a new economy based on sustainability.
Concrete Action Plan 2

Change IRS tax code to reward high-albedo concrete surfaces.

Private roads, driveways, parking lots, now subject to 15-year straight-line depreciation.

For the next 20 years, accelerate depreciation to 5 years for high-albedo concrete surfaces (one-time per project).

This will create new jobs now, induce all new surfaces to be high-albedo concrete.

This will also induce faster replacement of existing surfaces to high-albedo concrete.

It will also make many projects financially feasible.
Concrete Action Plan 3

Change IRS tax code to reward green buildings generally, provided they have high-albedo roofs and pavement surfaces.

Commercial buildings now subject to 39-year straight-line depreciation (27½ years res.)

For the next 20 years, cut depreciation in half with 75% accelerated in the first 5 years.

This will create new jobs now, induce all new surfaces to be green with high-albedo surfaces.

It will make many projects financially feasible now.

It will also change the entire building construction industry for the better within a decade.
THANK YOU!