SUBURBS, GEN Y, AND ALL THAT JAZZ

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Middle-class returns to city, avoids cars

Era of abundant fuel has ended for good

Romance with car ending

Public Transportation Revival

One occupant-per-car must end

Sound Familiar?
Predictions: 1973

The Painful Change to Thinking Small, *Time Magazine*, Dec 31, 1973

- There have been multiplying signs that the long American romance with the big car may finally be ending.
- More likely, the heavy car will linger as a limited-purpose, special-use auto, but not again become the basic American vehicle.
- Economists generally are agreed that the era of readily abundant fuel has ended for good.
- Public transportation will experience a revival.
- Car pooling will have to increase…the one-occupant-per-car habit is simply too expensive to be continued.
- Socially, there could be a movement of middle-class whites back to the city, where they can get away from auto dependence.

What have we learned since then? Is it enough?
Suburbs are growing in every US Region

US Suburbs share of population grows the last 20 yrs, in every region. [Source: W. Frey, Brookings Inst., 2012]
Growth by Metro Size

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Determinants</th>
<th>New Land Forms</th>
<th>GenY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CHICAGO</td>
<td>ATLANTA</td>
<td>DENVER</td>
</tr>
<tr>
<td>Population 2010</td>
<td>9,461,105</td>
<td>5,268,860</td>
<td>2,543,482</td>
</tr>
<tr>
<td>City Population 2010</td>
<td>2,695,598</td>
<td>420,003</td>
<td>600,158</td>
</tr>
<tr>
<td>% Growth, Metro Area, 2000-2010</td>
<td>4.0%</td>
<td>24%</td>
<td>17%</td>
</tr>
<tr>
<td>% Growth, City, 2000-2010</td>
<td>-6.9%</td>
<td>1.0%</td>
<td>8.2%</td>
</tr>
<tr>
<td>Urbanized Land Area, sq. mi., 2010</td>
<td>2,443</td>
<td>2,645</td>
<td>668</td>
</tr>
<tr>
<td>New Urbanized Area (Areas &gt; 1,000 pers/sq. mi 2040, 2030, 2035)</td>
<td>189</td>
<td>275</td>
<td>190</td>
</tr>
<tr>
<td>% Commuting by Transit, ACS, 2008/2009</td>
<td>11.5%</td>
<td>3.7%</td>
<td>4.6%</td>
</tr>
<tr>
<td>% VMT - Highway, 2010</td>
<td>42%</td>
<td>43%</td>
<td>44%</td>
</tr>
<tr>
<td>% VMT - Arterials/Streets, 2010</td>
<td>58%</td>
<td>57%</td>
<td>56%</td>
</tr>
<tr>
<td>% Jobs w/in 3 mi. of CBD, 2010</td>
<td>20%</td>
<td>10%</td>
<td>22%</td>
</tr>
<tr>
<td>% Jobs 10-35 mi. of CBD, 2010</td>
<td>67%</td>
<td>65%</td>
<td>37%</td>
</tr>
<tr>
<td>% Jobs Accessible by Transit &lt; 90 min, 2010</td>
<td>24%</td>
<td>22%</td>
<td>47%</td>
</tr>
<tr>
<td>Projected Jobs Added CBD</td>
<td>143,000</td>
<td>39,800</td>
<td>164,000</td>
</tr>
<tr>
<td>Projected Jobs Added Suburban Areas</td>
<td>1,190,000</td>
<td>788,000</td>
<td>728,000</td>
</tr>
</tbody>
</table>
Visualizing Why-Determinants of Housing Location Choice

• Our paper concluded that important factors for housing location are
  – housing price,
  – school quality, and
  – commute time

• We mapped these for Metropolitan Statistical Area of Chicago
The average one-way commute time for Metro Chicago is 30 minutes. This graph shows the fraction of commuters in each zip code that have a shorter-than-average (<30 min) commute. (American Community Survey, 5-yr Avg., 2007-2001)
Do Suburbs require longer commutes?

Percentage of Low Commutes (<30 min. one-way). The average percentage of low commutes (48%) represents a strong clustering value for Chicago metro area. Percentages rarely go outside of 25-75% low commutes.
School Quality

School Quality is measured from a state-wide standardized test, with scores scaled from 0-10 (10=highest test score). Each dot indicates an elementary, middle, or high school. The larger the dot, the higher the test score for the school. The pink shading is an average of school test scores in the zip code. (Great Schools Rating, 2013)
Housing Price

Shading for each zip code represents the average price of a square-foot of residential space. (Zillow Price Data, 10-yr. Median, 2003-2013)
Commutes, Schools, Cost

% Low Commutes
57 - 100
53 - 57
49 - 53
44 - 49
40 - 44
0 - 39

Avg. School Rating
8.4 - 10
7.3 - 8.4
6.0 - 7.3
4.0 - 6.0
2.5 - 4.0
0 - 2.5

Median Price per Sq. ft ($)
227 - 420
182 - 227
156 - 182
132 - 156
111 - 132
66 - 111

Z-score = \frac{(Value) - (Average Value)}{(Standard Dev. of Values)}

Z_score_Comm
5.0
-4.6

Z_score_School
1.7
-2.3

Z_score_Hsg_
4.5
-1.8

x (-1) = Total Z-score

ACS 5-YR Estimates, 2007-2011
Great Schools, 2012 (Non-profit, ind. evaluation)
Zillow Sales Data, 2003-2013

CHICAGO MSA - Z-scoring
Attractive places to live for Chicago home shopper

Darker means more attractive to shoppers.

CHICAGO MSA - Z-Scores
### Statistics

<table>
<thead>
<tr>
<th></th>
<th>CBD</th>
<th>City of Chicago</th>
<th>Inner Suburbs</th>
<th>Outer Suburbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>209,430</td>
<td>2,714,711</td>
<td>3,100,224</td>
<td>2,716,532</td>
</tr>
<tr>
<td>Avg. Density (Zip Code)</td>
<td>16,300</td>
<td>14,800</td>
<td>4,320</td>
<td>1,460</td>
</tr>
<tr>
<td>% Low Commutes</td>
<td>65%</td>
<td>44%</td>
<td>50%</td>
<td>48%</td>
</tr>
<tr>
<td>Avg. School Rating</td>
<td>6.3</td>
<td>3.8</td>
<td>6.4</td>
<td>6.4</td>
</tr>
<tr>
<td>Med. Price per Sq. ft ($)</td>
<td><strong>$273</strong></td>
<td><strong>$197</strong></td>
<td><strong>$183</strong></td>
<td><strong>$128</strong></td>
</tr>
</tbody>
</table>

*Notes:
- Population: ACS, 2011
- % Low Commutes: ACS, 2007-2011
- Med. Price per Sq. ft ($) - Zillow, 2003-2013

**CHICAGO MSA - Urban Area Stats**
CAN WE MAKE SUBURBS MORE SUSTAINABLE?

SHOULD WE?
Example: Pecan Street (Austin, TX)
Example: West Village (Davis, CA)
Example: Low-carbon Society Project (Toyota City, JP)

All 67 homes have:
• PV Solar Panels
• Plug-in Vehicle
• Home Energy Management
• House battery

Soon
• Carsharing
• Multi-modal navigation

Show Video
What about GenY?
GenY drives much less

Will GenY culture change car-dependent environment in US?
Gen Y: Life-cycle effect is delayed

A new care-free 20s demographic creating noticeable consumer shifts, exaggerated due to economic crisis.
Gen Y: Still want a Family

Gen Y: marriage and family is important, plan to get married and have children.

Will Gen Y resist economic incentives to suburbs when they start families?
Gen Y: Still want Homes

Share Who Intend to Own a Home, 2012

- **TD Bank** (18-34 yr olds): 84%
- **Wood. Wilson Center** (non-homeowners): 75%
- **Nat. Assoc. of Home Builders** (non-homeowners): 68%

Home ownership level, U.S.
Contact

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BACKUP
Cost drives adoption rates

• Which would you buy (in 2004)?
  – 2004 Corolla  $13.5k  34 MPG
  – 2004 Prius  $20.5k  46 MPG

• At time, criticism from both sides, i.e. industry observers (bad value trade-off) and environmentalists (not green enough).

• But, over 2M Prii sold, saved millions of tons CO$_2$
Batteries Have a Long Way to Go

Chevy Volt Battery

435 lb (197 kg)

≈ 37 mi ≈

10-12 hr charge (L1)
3-4 hr charge (L2)

$3.50
6 lb (2.7 kg)

Compared to the same range of gas, the battery is

75 times heavier

1000 times more expensive

Assumes prices of $3.50/gal of gas and at least $250/kWh for the battery
CITY of CHICAGO
2010 Urbanized Area

Population Growth
(Mean pop. change by 2040 = 265%)

243 - 436%
436% +