Regulating Greenhouse Gases, Not People: Opportunities & Possibilities

Outline

- Economic Sustainability
- Regulating People
  (Behavioral: Compact City Policies)
  - Regulating Greenhouse Gas Emissions
    (Green Technology)
  - Opportunities & Possibilities
  - Conclusion: The Potential for Success
Starting Points

• Assumption: *National GHG emission reduction objectives will be adopted.*

• Principle: *Policies must be effective or the objectives will not be met*

• Issue: *Mandatory compact city policies v. green technology*

The Thesis....
IT’S THE ECONOMY....

• GHG emissions objectives can only be met by a vibrant economy.

• Regulating people (compact city policies)
  – Focus: Changing behavior (indirect)
  – Little potential to reduce GHG emissions
  – Would do so at exorbitant cost
  – Could seriously damage the economy & increase poverty.

• Regulating GHG emissions (green technology)
  – Focus: Reducing GHG intensity of how we live (direct)
  – Potential to meet virtually any GHG reduction objectives
  – Much lower cost to the economy.
ECONOMIC SUSTAINABILITY
ECONOMIC GROWTH & POVERTY ALLEVIATION

Economic sustainability: Essential to environmental sustainability

Economics: A History of Poverty
CANNOT TAKE AFFLUENCE FOR GRANTED
Economies Vary by Extent of Poverty
THERE ARE WEALTHY IN ALL NATIONS

$35,000
$40,000
$30,000
$25,000
$20,000
$15,000
$10,000
$5,000
$0

GDP/Capita 2000$

United States
Australia
Japan
W. Europe
Argentina
Asia
Latin America
Africa

1900 1920 1940 1960 1980 2000

Personal Mobility: Increases Economic Growth
ACCESS TO LARGER NUMBER OF JOBS

• Minimizing Travel Time & Economic Growth
  – Congestion costs
  – Productivity

• Research: More Job Access in Fixed Time Means Better Urban Economic Performance
  – Prud’homme et al (U. of Paris)
  – Cervero (U. of California)
  – Hartgen (U. of North Carolina)
Personal Mobility Alleviates Poverty
HOW PERSONAL MOBILITY EMPOWERS

• Few low income central city residents in Boston could reach high growth suburban employment areas within one hour by transit.
  –Federal Transit Administration

• Given the strong connection between cars and employment outcomes, auto ownership programs may be one of the more promising options and one worthy of expansion
  –Blumentberg & Waller (Brookings Institution)

In most cases, the shortest distance between a poor person and a job is along a line driven in a car
  –Waller & Hughes (Progressive Policy Institute)

If automobiles were available to all African American households, the gap between non-Hispanic-white and African-American unemployment would be reduced by nearly one-half.
  –Raphael & Stoll (UC-Berkeley)
US Metropolitan GDP (PPP) Dominates
WORLD METROPOLITAN AREAS >1,000,000 (2005)

Adapted from OECD & BEA data

US Work Trip Travel Time Shorter
COMPARED TO INTERNATIONAL URBAN AREAS

Hong Kong
New York
Los Angeles
Sydney
Dallas-Fort Worth
Houston
Phoenix
Atlanta
Suburban World
NEARLY ALL URBAN GROWTH SUBURBAN FROM 1960

Cost Effectiveness is Crucial
UN IPCC MAXIMUM RANGE PER METRIC TON

$20
Market
Less than $15

Above $50 is wasteful
Detracts from efforts to reduce GHGs
& unnecessarily reduces employment & economic growth

$50
McKinsey Average
$17
Regulating People
MANDATORY COMPACT CITY POLICY

Changing how we live and work

Seoul

Study: Multi-Unit GHG Emissions Higher
INCLUDING COMMON ENERGY EMISSIONS

Source: Energy Australia Study

Huge research gap

Multi-Unit
Single Family

Annual GHG Tons/Capita

9+ Floors 4-8 Floors <4 Floors Townhouse Detached

No US data

Seoul

Sydney
Suburban Transit Access: Slow & Limited
EXCEPT TO LARGEST COMMERCIAL CORES: CASE OF PARIS

Jobs Accessible in 1 Hour
- Auto: 84%
- Transit: 16%
Not Accessible
- Auto: 16%
- Transit: 59%

Example: Skeletal automated metro Imposed on Portland
Would cost more than all personal income annually

Metropolitan Auto Competitiveness Required
CANNOT BE ACHIEVED AT AFFORDABLE COST

Transit Work Trips
Nearly Double Cars
Behavioral Strategies Fall Short

DRIVING & GHG REDUCTION

Based on synthesis in Caroline Rodier TRB Paper

Transit/Land Use Strategies Expensive

COST PER TON REMOVED: SAN FRANCISCO

Source: 2035 Plan
House Price Escalation: The Big Problem

ECONOMICS: SCARCITY INCREASES PRICES

Housing bubble where restricted land use, not where less restrictions

No bubble where more suburbanization

Paul Krugman, Princeton University
2008 Nobel Prize in Economics

The Difference is Land & Regulation

1,600 SQUARE FOOT STARTER HOUSE: 2006

UK Research: 500x difference in land price
Adjacent parcels with & without land permission
Land Rationing is the Issue
DESTROYS HOUSING AFFORDABILITY

... the affordability of housing is overwhelmingly a function of just one thing, the extent to which governments place artificial restrictions on the supply of residential land.

Donald Brash, Governor,
Reserve Bank of New Zealand
1988-2002

Introduction to
4th Annual Demographia International Housing Affordability Survey

Yet Smart Growth Advocates Agree
ONLY QUESTION IS HOW MUCH IT INCREASES COSTS

<table>
<thead>
<tr>
<th>Prescriptive Planning (Smart Growth) Policies:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Including Potential for Increasing Housing Prices</td>
</tr>
<tr>
<td>Strategy</td>
</tr>
<tr>
<td>1 Regional Urban Growth Boundaries</td>
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<tr>
<td>2 Local Urban Growth Boundaries</td>
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<td>3 Regional Urban Service Districts</td>
</tr>
<tr>
<td>4 Local Urban Service Districts</td>
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<tr>
<td>5 Large-Lot Zoning in Rural Areas</td>
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<td>6 High Development Fees &amp; Exactions</td>
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<td>7 Restrictions on Physically Developable Land</td>
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<td>8 State Aid Contingent on Local Growth Zones</td>
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<td>9 Transferable Development Rights</td>
</tr>
<tr>
<td>10 Adequacy of Facilities Requirements</td>
</tr>
<tr>
<td>From Table 15.4, “Costs of Sprawl—2000”</td>
</tr>
</tbody>
</table>
Median House Price Increases
RELATIVE TO HOUSEHOLD INCOMES

Responsive Markets
Prescriptive Markets

Median Multiple:
Median House Price/
Median Household Income

Texas & California House Prices
1980-2009: MEDIAN MULTIPLE

Volatility (Glaeser & Gyourko →

Fischell (Dartmouth):
House prices similar in California
In 1970 to rest of nation.
Attributes increase to regulation.
Minority Home Ownership Trails
GAP UNLIKELY TO NARROW WITH SMART GROWTH

COMPACT CITY PROJECTIONS: PROBABLY OPTIMISTIC
Most New US $ Goes to Excess Costs
1982-2006: INFLATION ADJUSTED

- New Ridership: 33%
- Excess Above Inflation: 67%

Calculated from NTDB data

Tokyo Rail Transit Map

Density Increases Congestion
TRAFFIC INTENSITY IN WORLD URBAN AREAS

- Vehicle Hours/Square Mile By Population Density
- Hong Kong

- Under 3,000: 1,540
- 3,000-4,999: 2,340
- 5,000-9,999: 4,183
- 10,000-19,999: 6,187
- 20,000 & Over: 11,373

1,540 2,340 4,183 6,187 11,373
Reduce VMT: Reduces GHG Less
CITY CYCLE V. MORE CONGESTED JAPAN URBAN CYCLE

Average Speed

Fuel Economy (MPG)

New York City Cycle
(More congested)
May reduce GHGs only 25%

Lower speed & congestion are the problem
HUGE RESEARCH GAP

The Modeling Record
HUGE FORECAST ERRORS ARE LIKELY
Regulating Greenhouse Gas Emissions
GREEN TECHNOLOGY

Reducing GHG emissions from how we live and work

Zero Emission House: Japan
2,100 SQUARE FEET: DETACHED

- Roof vegetation
- High Performance VIP hybrid PU Insulation Board
- Small Wind Turbine Generator
- Residential Fuel Cell systems
- PV (photovoltaic) systems
- High efficient heat pump hot-water supply systems
- Electric vehicles
- Vacuum Insulation Glass

New 35.5 MPG Standard Reduces GHGs

**Driving & GHG Reduction**

<table>
<thead>
<tr>
<th>Year</th>
<th>Driving &amp; GHG Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>10%</td>
</tr>
<tr>
<td>2020</td>
<td>20%</td>
</tr>
<tr>
<td>2030</td>
<td>30%</td>
</tr>
<tr>
<td>2040</td>
<td>-10%</td>
</tr>
<tr>
<td>2050</td>
<td>-20%</td>
</tr>
</tbody>
</table>

Land Use & Transit Impact Equal to 2 MPG Improvement In Fuel Economy

President: Will pay for itself

Better Technology is Already Here
MOST EFFICIENT HYBRIDS
Potential: Existing (Hybrid) Technology

Driving & GHG Reduction

40%
50%
60%
70%
80%
90%

2010 2020 2030 2040 2050

-10%
-20%
-30%
-40%
-50%
-60%
-70%
-80%
-90%

Driving Projections May be High

Rate of Increase Has Declined

Why?
Nearing Car Saturation:
Minorities
Women

Pisarski

Recent rates less even with gas price increases
Puentes & Tomer (Brookings)
European Parliament MPG Requirement
58 MPG BY 2020

Paris: 12 Lane Freeway

OCCUPUNTIES & POSSIBILITIES

Shenzhen, China
Potential: Volkswagen: 235 MPG Car
LIMITED EUROPEAN MARKETING BEGINS IN 2010

Obama 150 MPG car by 2015

Compressed Air Car: Tata to Build
ZERO GHG EMISSION POTENTIAL
Many Opportunities
EVIDENCES OF HUMAN INGENUITY

- Producing gasoline from CO2
- Alternative Fuels Production by Yeast
- Cellulosic ethanol
- Plug in vehicles
- Green Car Sharing (Paris, London & Austin)
  - [http://www.thisislondon.co.uk/standard/article-23656098-details/Boris+plans+electric+car+hire+scheme+for+London/article.do](http://www.thisislondon.co.uk/standard/article-23656098-details/Boris+plans+electric+car+hire+scheme+for+London/article.do)
- Telecommuting

CONCLUSION:
THE POTENTIAL FOR SUCCESS
## Dimensions of Sustainability

### POTENTIAL TO MEET OBJECTIVES

<table>
<thead>
<tr>
<th>DIMENSION OF SUSTAINABILITY</th>
<th>REGULATING PEOPLE (MANDATORY COMPACT CITY POLICIES)</th>
<th>REGULATING GREENHOUSE GAS EMISSIONS (GREEN TECHNOLOGY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVIRONMENTAL SUSTAINABILITY</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Does the strategy have the potential to achieve the GHG emission reduction objective?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FINANCIAL SUSTAINABILITY</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Can the strategy reduce GHG emissions at a cost within the $50 ceiling per ton?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECONOMIC SUSTAINABILITY</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Is the strategy without serious potential for reducing economic growth or increasing poverty?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POLITICAL SUSTAINABILITY</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Is the strategy without serious potential for public rejection or evasion?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OVERALL EVALUATION</td>
<td>NO</td>
<td>YES</td>
</tr>
</tbody>
</table>

## Conclusion

### THE POTENTIAL FOR SUCCESS

- **Behavioral strategies** (indirect) likely to fail
  - Not environmentally sustainable
  - Intrusiveness could be devastating to economic growth and increase poverty
  - Not economically sustainable
  - Not necessary
- **Green Technology**: (direct) has the potential to succeed
  - Advantage: Allow economic growth & job creation while meeting GHG objectives
Appendix
RELEVANT DEMOGRAPHIA RESOURCES

• GHG Commentaries
  – http://www.newgeography.com/
  – GHG Emissions and Reality: Residential Emissions
  – Enough "Cowboy“ GHG Reduction Policies
  – Regulating People or Regulating Greenhouse Gases?
  – A Rational Approach to GHG Emissions Reduction
  – GHG Reduction Policy: From Rhetoric to Reason

Appendix
RELEVANT DEMOGRAPHIA RESOURCES

• International Housing Affordability Survey
  – 6 nations, 265 markets
  – 5th annual edition
Appendix

RELEVANT DEMOGRAPHIA RESOURCES

• World Urban Areas
  – Population, land area, density for all urban areas over 500,000
  – 5th annual edition