The Case for New Trends in Travel

The Future of Cities and Travel

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Successful Strategies from Florida
Successful Strategies from Florida
Outline

- A little theory
- A little data
- A little speculation
Disclaimer

The level of understanding and the amount of data regarding travel behavior have never been better.

Yet it remains difficult to predict human behavior, new technologies, and natural phenomena that may influence the ultimate demand for travel.
Disclaimer

We haven’t been able to predict
- Who will win the next election,
- Which movie or TV show will be popular,
- What will be the hot Christmas gift, or,
- Which stocks (if any) will do well next year.

Therefore we shouldn’t apologize for uncertainty regarding future travel.

But we should plan for uncertainty.
A Fundamental Desire to Travel

- Travel is fundamental to the human desire to interact and socialize. The desire to travel will continue as it has through the history of mankind.

- Travel enables economic interaction and the transportation of products and is fundamental to the functioning of the economy.
A Fundamental Desire to Travel

- Growth in income and knowledge fuel the desire to become more specialized in employment, social interactions, and consumption.
A Fundamental Desire to Travel

- People do not necessarily aspire to travel.

- They do aspire to carry out the economic and social interactions enabled by travel.

- Planners are torn between providing mobility, minimizing the impacts of mobility, or minimizing mobility.
A Framework for Thinking About Future Travel

Drivers of Travel Behavior

Socio-Economic Conditions
- Household/Person Characteristics
- Economic Conditions
- Behaviors/Priorities
- Business Conditions

Land Use
- Density
- Mix
- Urban Form
- Urban Design
- Activity Scale/Specialization
- Contiguousness

Transportation System
- Modal Availability
- Modal Performance
- Cost
  - Speed/Congestion
  - Safety, Reliability, Convenience, etc.

Economy
Security
Family Structure
Institutional Structures
Legal/Political Climate
Culture/Values
Technology
Etc.

Demand Factors
Supply Factors

Travel
Travel Growth Estimation Equations

4 Step Modeler

Trip Generation

\[
\text{Population} \times \frac{\text{Person Trips}}{\text{Person}} \times \frac{\text{Person Miles}}{\text{Person Trips}} = \text{Vehicle Miles}
\]

Trip Length

\[
\text{Population} \times \frac{\text{Person Miles}}{\text{Person}} \times \frac{\text{Vehicle Miles}}{\text{Person Miles}} = \text{Vehicle Miles}
\]

Mode

Activity Modeler

Travel Time Budget

\[
\text{Population} \times \frac{\text{Person Hours of Travel}}{\text{Person}} \times \frac{\text{Vehicle Miles}}{\text{Person Hour of Travel}} = \text{Vehicle Miles}
\]

Travel Speed/Mode

Economist

Income

\[
\% \Delta \text{Population} + \frac{1}{3} \times \% \Delta \text{Personal Income} = \% \Delta \text{Vehicle Miles of Travel}
\]
What Has Changed?

Historic trends in travel:
Socio-Economic
Demographic
Travel

"Without data, you're just another person with an opinion."
YTD VMT -3.0% thru July 2008, -3.8% rural, -2.5% urban

VMT Growth Trends

Annual Change in Population and VMT

- VMT Change (each year)
- VMT Change (annualized 5-yr. avg.)
- Population Change
U.S. Population is Concentrated in Peak Travel Age Cohorts

Source: CUTR analysis of NHTS and NPTS and U.S. Census Bureau
Older Women Less Likely to Drive

Source: FHWA, Highway Statistics Series, 2000
Average Household Size is Stabilizing, 1930-2000

Per ACS 2007, Average HH size is now 2.61.

Source: U.S. Census Bureau
Per ACS 2007, zero-vehicle households are now down to 8.72%, constituting about 6.05% of population.
Vehicle Saturation?
Vehicle Gluttony?

Ratio of Vehicles to Persons Over 16
Ratio of Vehicles to Drivers
Ratio of Vehicles to Workers

Source: FHWA, Highway Statistics Series
Census Work Trips
Carpooling Mode Share

Per ACS 2007, nationwide carpooling is now 10.4%.

Source: U.S. Census Bureau
Declining Walk Shares

Per ACS 2007, walking is now 2.84%.

Source: CUTR analysis of NHTS and NPTS, U.S. Census Bureau
Per ACS 2007, Transit usual mode commuting is now 4.88%.
Person Trips per Person per Year and PMT per Person Trip

Source: CUTR analysis of NHTS and NPTS
Factors Contributing to US VMT Growth 1977-2001

- Trip Length: 10%
- Mode Shifts: 16%
- Trip Frequency: 46%
- Population: 28%

Source: CUTR analysis of NHTS and NPTS
NHTS/NPTS Data Suggest Travel Speeds are Now Slowing

Changes in mode, path, departure time, and moving to the suburbs enabled higher speed travel.

Have we run out of ways to travel faster?

Source: CUTR analysis of NHTS and NPTS
Travel Time Budgets Have Grown 1.8 Minutes per Day per Person per Year

Source: CUTR analysis of NHTS and NPTS
What Might Change?

...CARBON CREDITS....

TICKET FARE $2.50
### Elasticity of Travel with Respect to Personal Income Changes

<table>
<thead>
<tr>
<th>Study</th>
<th>Percent change in per capita VMT for each 1% Increase in per capita personal income</th>
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</thead>
<tbody>
<tr>
<td>NSTPRSC Forecasts</td>
<td>+0.39%</td>
</tr>
<tr>
<td>Pickrell and Schimek (1999)</td>
<td>+0.35% to 0.37%</td>
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<tr>
<td>2001 NHTS Derived (CUTR)</td>
<td>Trip Rate</td>
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<td>0.1564</td>
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Personal Income Impacts

- Will personal income grow at its historic rate of ~1.5%/year?
- Will travel continue to respond to income growth?
  - Vehicle availability
  - Travel speed
  - Personal income growth across the income distribution
Impact of Density

- High density urban areas have as little as half the per capita VMT as exurban areas.
- Future high density residents may not behave as in the past.
  - Income
  - Vehicle ownership
- The specialization of activity and consumption may be offsetting the economy of density (work, shop, recreate, worship, medical, education).
The average size of an elementary school in the U.S. has grown from 155 students in 1950 to 473 in 2000.

America has gone from having 81 grocery stores per million persons in 1977 to 35 per million in 1997.

In 1970, there were 34 hospitals per million persons. In 2000 there were 20.
1940 - Went to the Doctor
2008 - Went to the General practitioner who referred you to the specialist who sent you to the scanning center, the pharmacist, and the physical therapist.
“They said we need high density to make public transit work. “

“No, they said we need public transit to make high density work.”
Future Travel Costs?

Jeff Rubin of CIBC World Markets was laughed at three years ago when he predicted $100 per barrel oil, and now thinks it will climb to $225 in four years.

by Lloyd Alter, Toronto On 04.25.08

PPI does not incorporate:

- shift from rural to urban design standards for larger share of projects
- more/better MOT
- more technology in infrastructure
- higher cost right-of-way
- more mitigation investments
- The cost of buying consensus, etc.
Cost of Mode Shifts

- Bus = $0.80 operating and $0.15 capital per pm ≈ $0.95.
- LRT = $0.60 operating and $1.60 capital per pm ≈ $2.20.
- >75% provided by public funds ≈ $0.75 - $1.70 per PMT
- ~ $0.02 per PMT for roadway travel provided by tax sources.

Therefore, public transit is dramatically more public cost intensive.

Source: National Transit Data 2006
Transit’s Future

- Financial sustainability
- Economy of scale for transit expansion
- Elasticity of demand to transit service expansion
- Environmental efficiency
- Ability to influence location choices
- Consistency with customer values (security, convenience, privacy, image, etc.)
Comments on Non-Urban Travel?

- One vacation is equivalent to up to a 10 mile per day longer commute.
- How does city rebuilding compare to other mobility accommodating strategies? (Is a country that won’t raise gas taxes a dime willing to transform urban America?)
- Managing regional growth versus urban growth.
$100,000 worth of Tata Nanos