

The Case for New Trends in Travel



The Future of Cities and Travel

Steven E. Polzin, PhD.

Center for urban Transportation Research

University of South Florida

October 19, 2008

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.

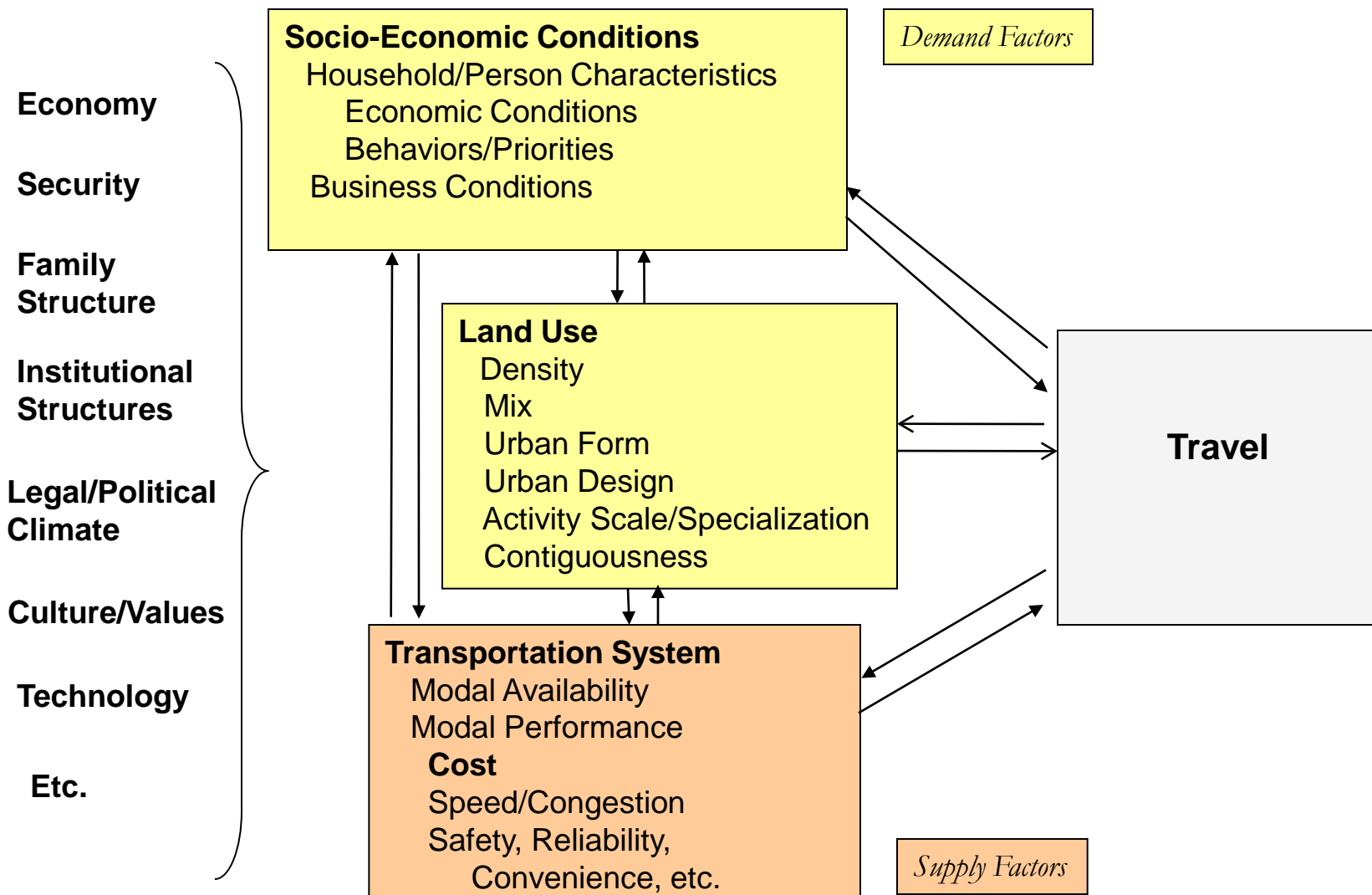


A Fundamental Desire to Travel

- ◆ People do not necessarily aspire to travel.
- ◆ They do aspire to carryout 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



Travel Growth Estimation Equations

4 Step Modeler

Trip Generation

Trip Length

Mode

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

Activity Modeler

Travel Time Budget

Travel Speed/Mode

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

Economist

Income

$$\% \Delta \text{ Population} + 1/3 \times \% \Delta \text{ Personal Income} = \% \Delta \text{ Vehicle Miles of Travel}$$

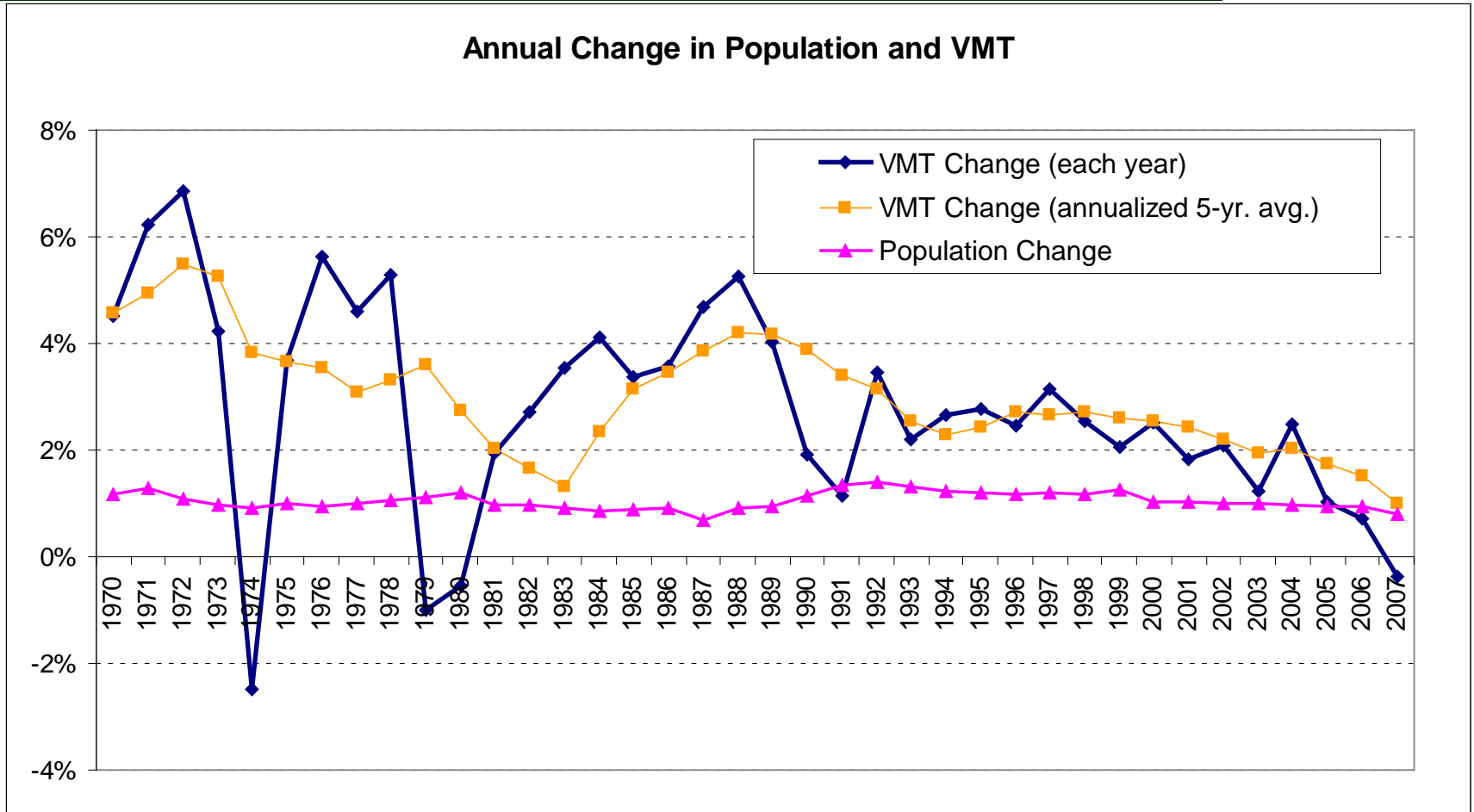
What Has Changed?



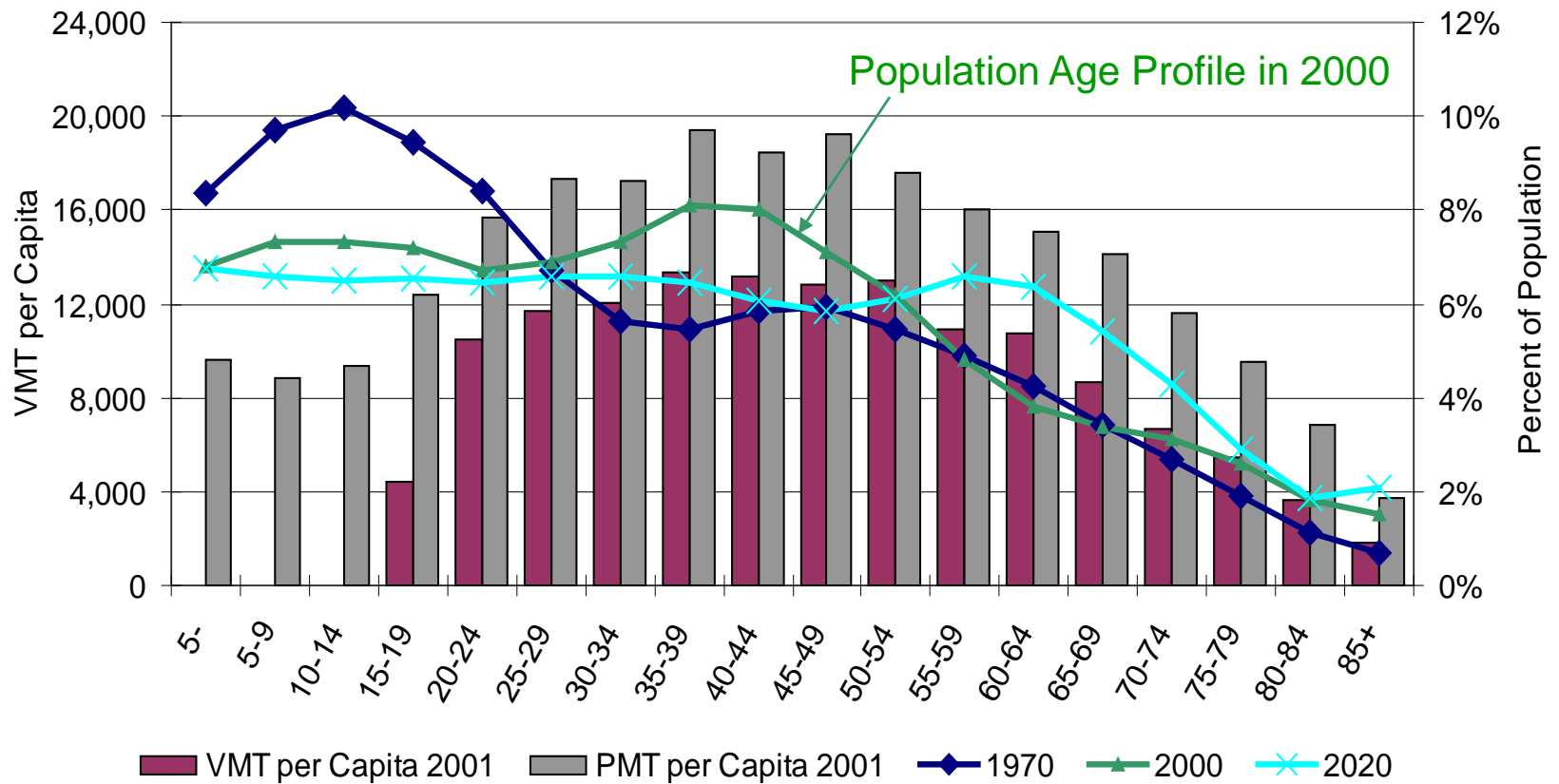
Historic trends in travel:
Socio-Economic
Demographic
Travel

“Without data, you're just another person with an opinion.”

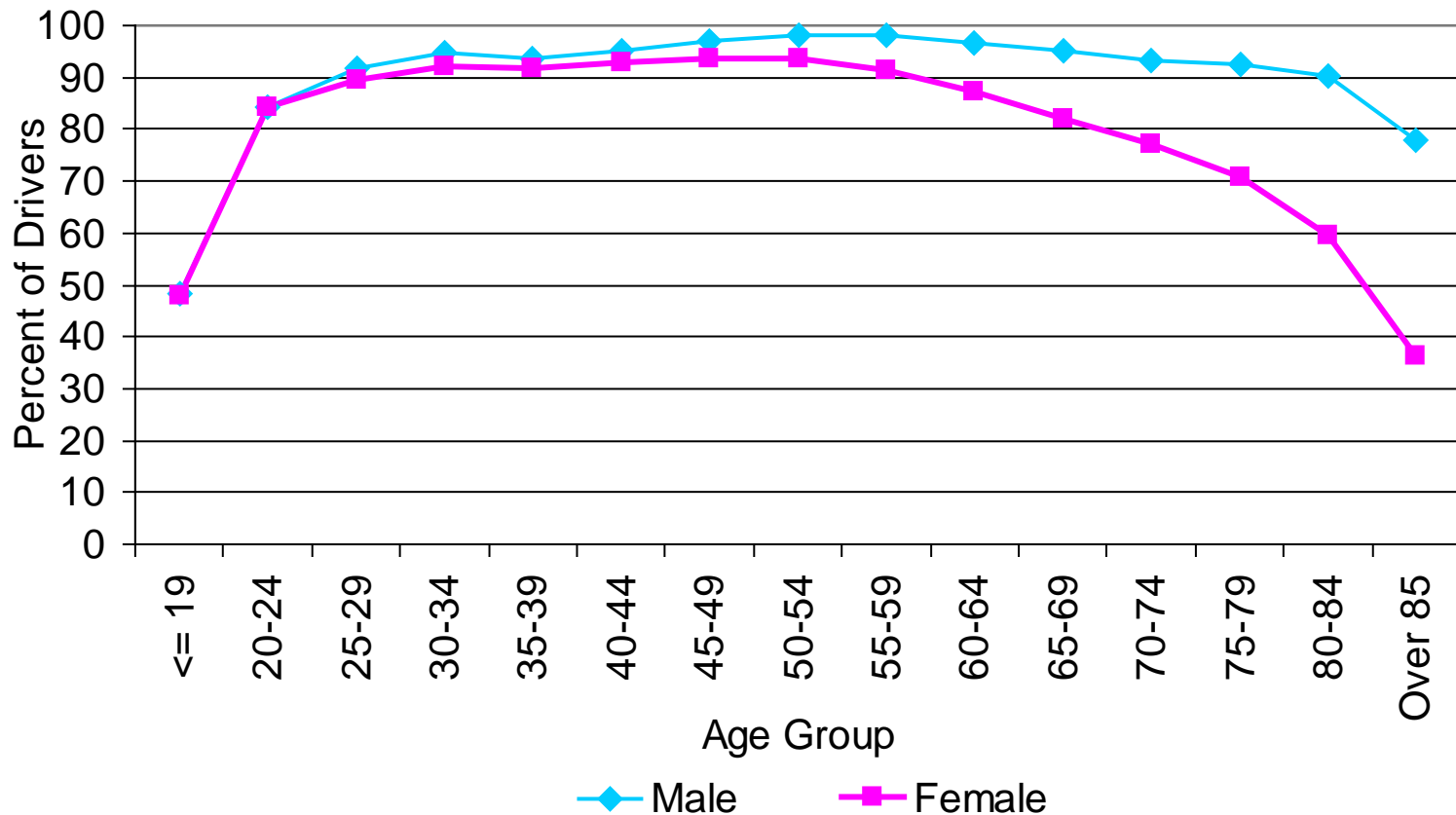
VMT Growth Trends



U.S. Population is Concentrated in Peak Travel Age Cohorts



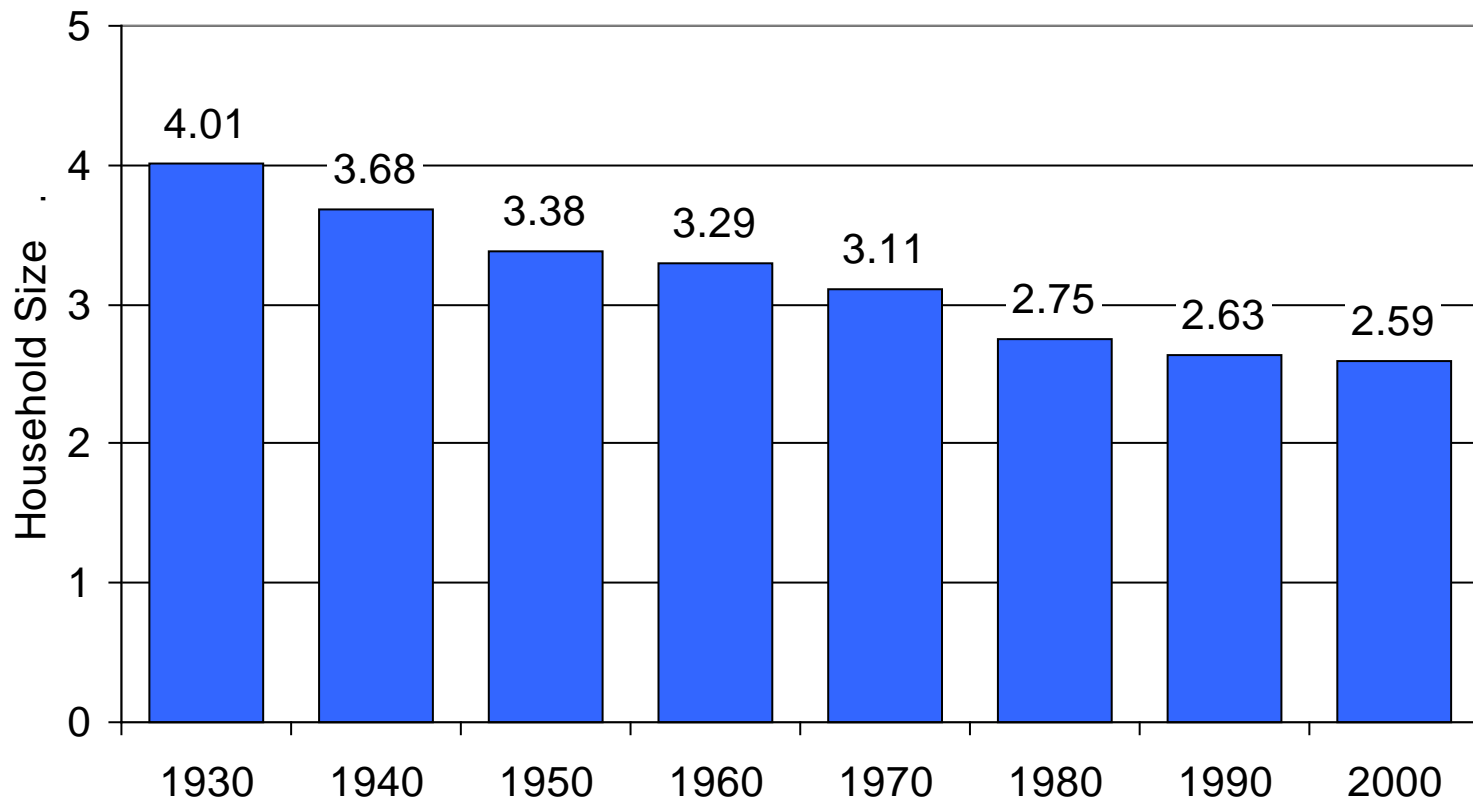
Older Women Less Likely to Drive



Source: FHWA, Highway Statistics Series, 2000

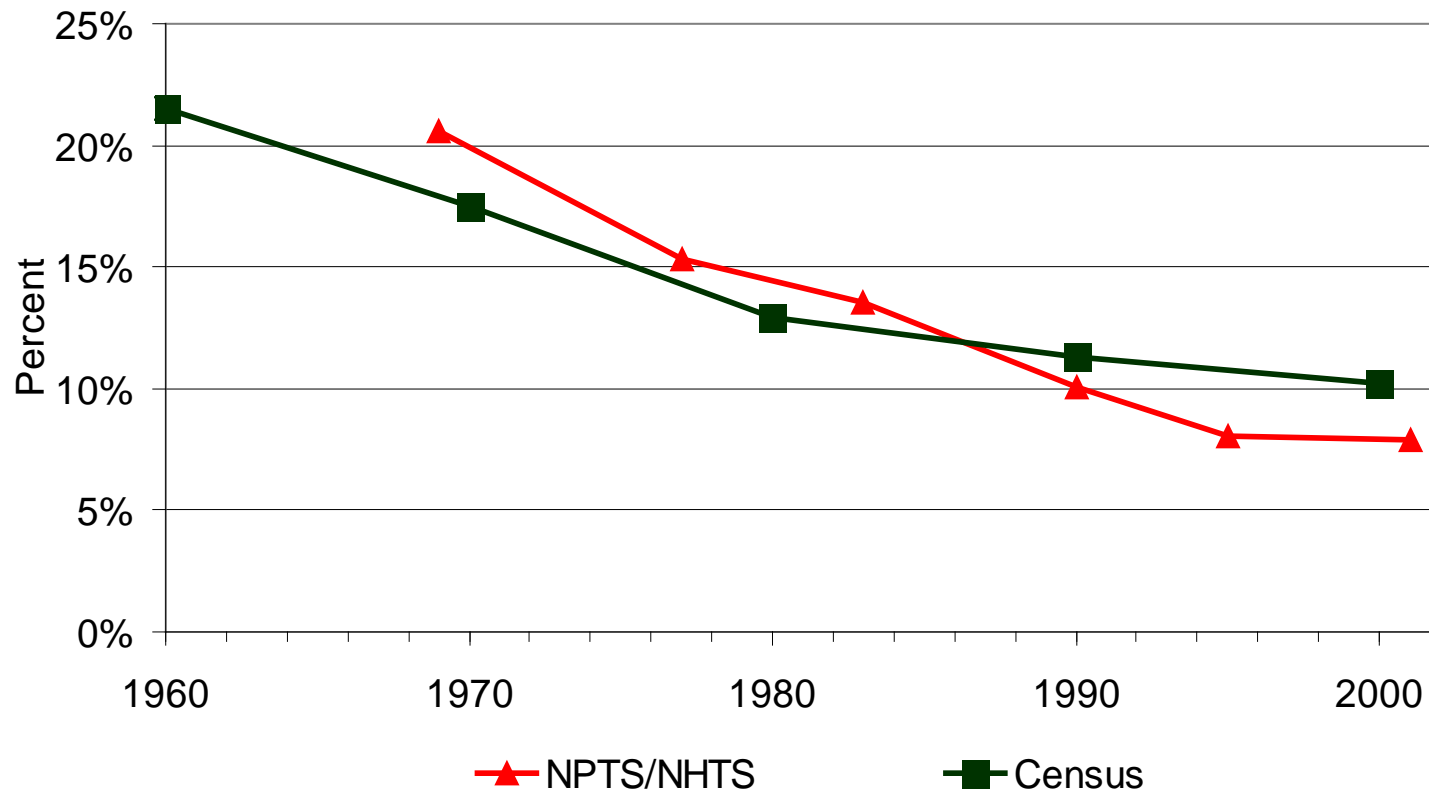


Average Household Size is Stabilizing, 1930-2000

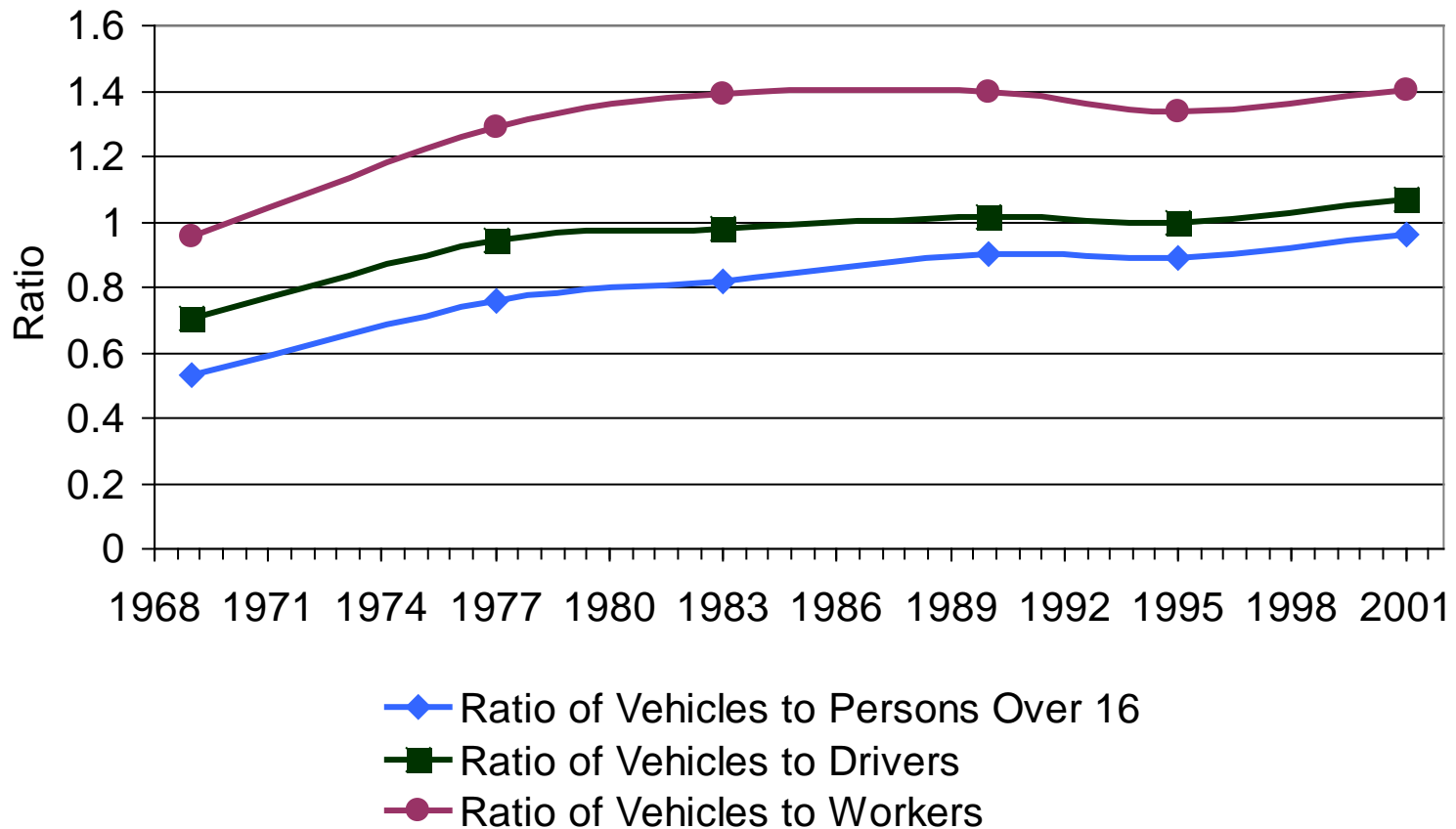


Per ACS 2007, zero-vehicle households are now down to 8.72%, constituting about 6.05% of population .

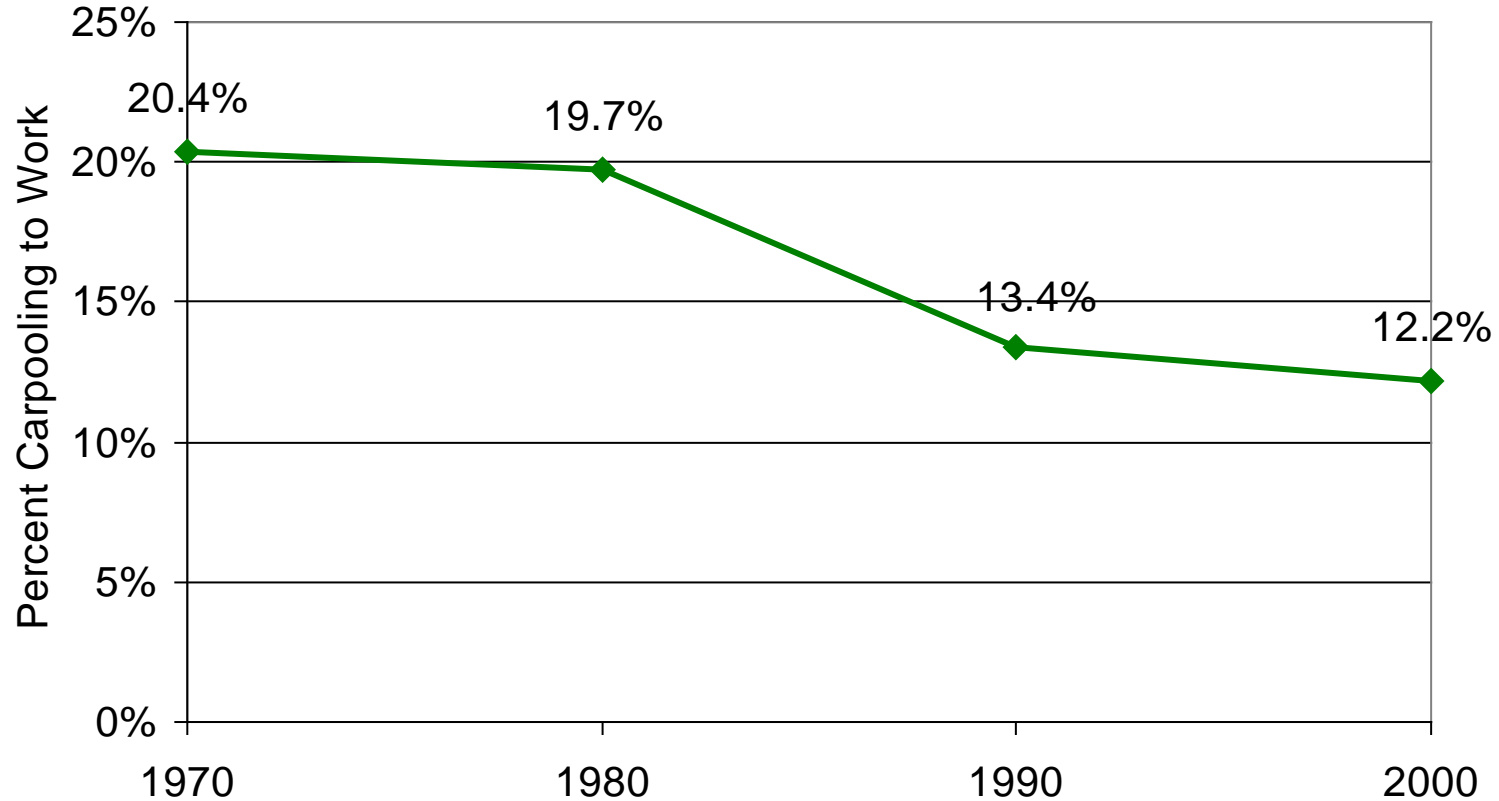
Declining Zero-Vehicle Households



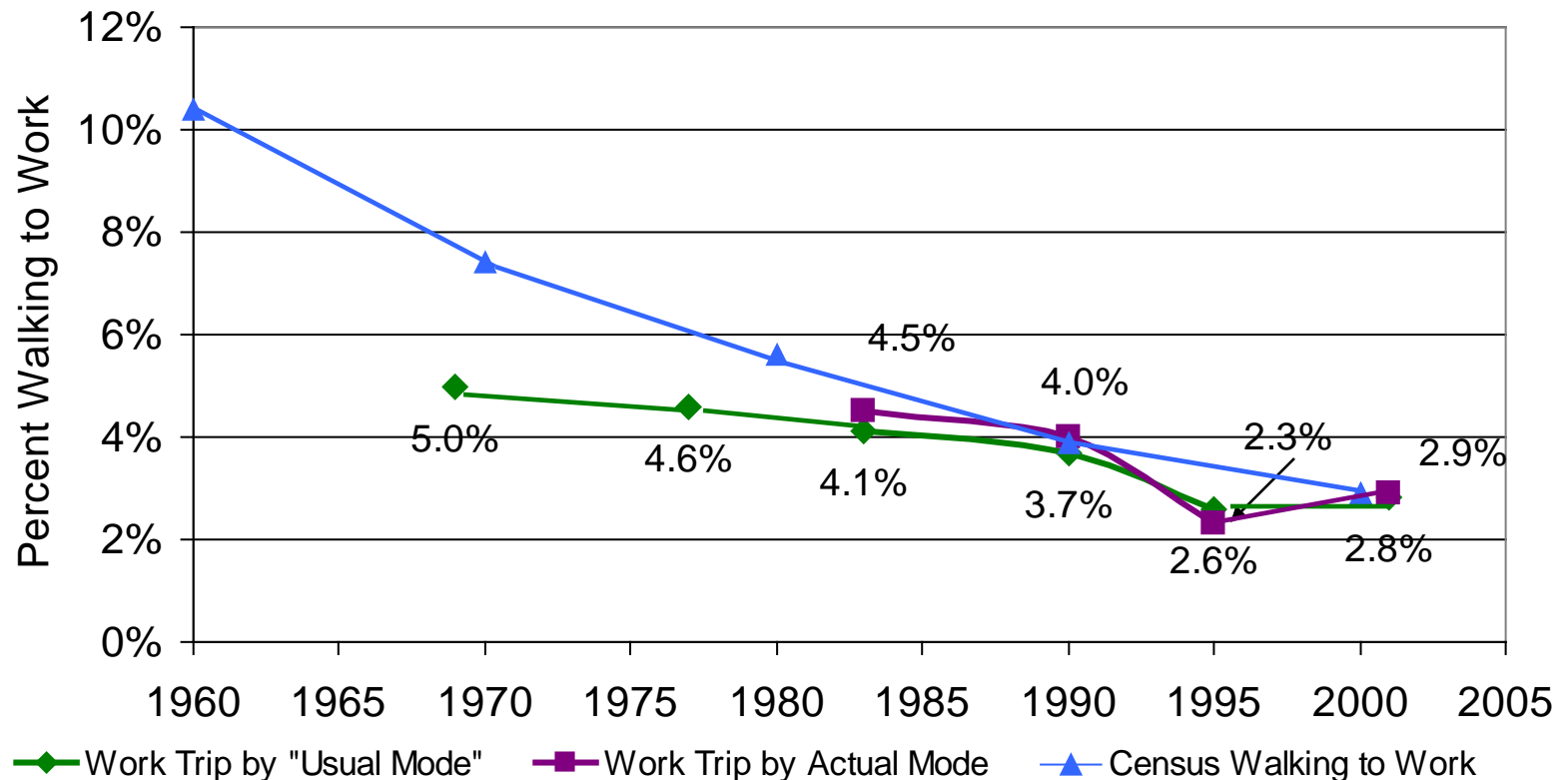
Vehicle Saturation? Vehicle Gluttony?



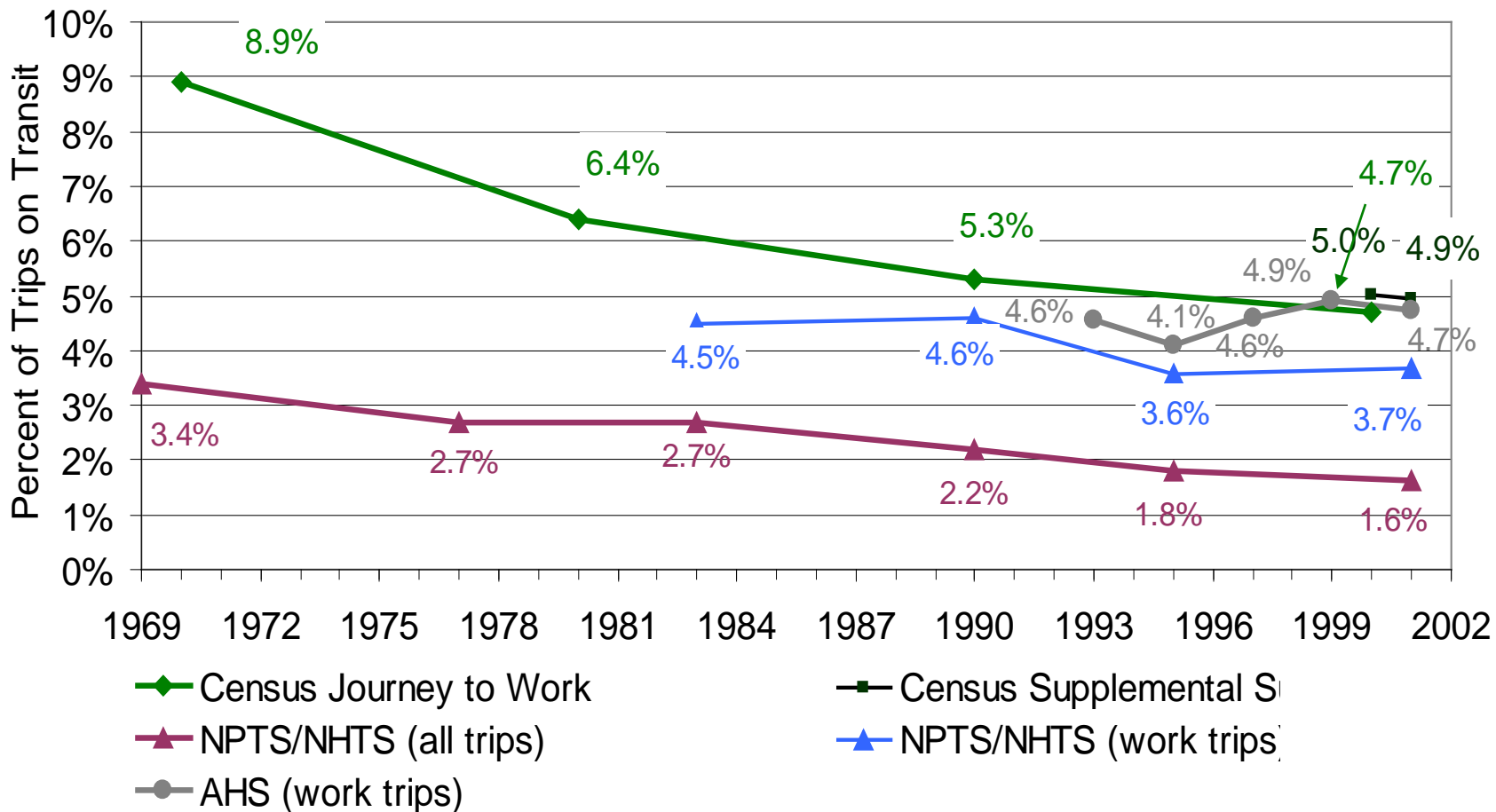
Census Work Trips Carpooling Mode Share



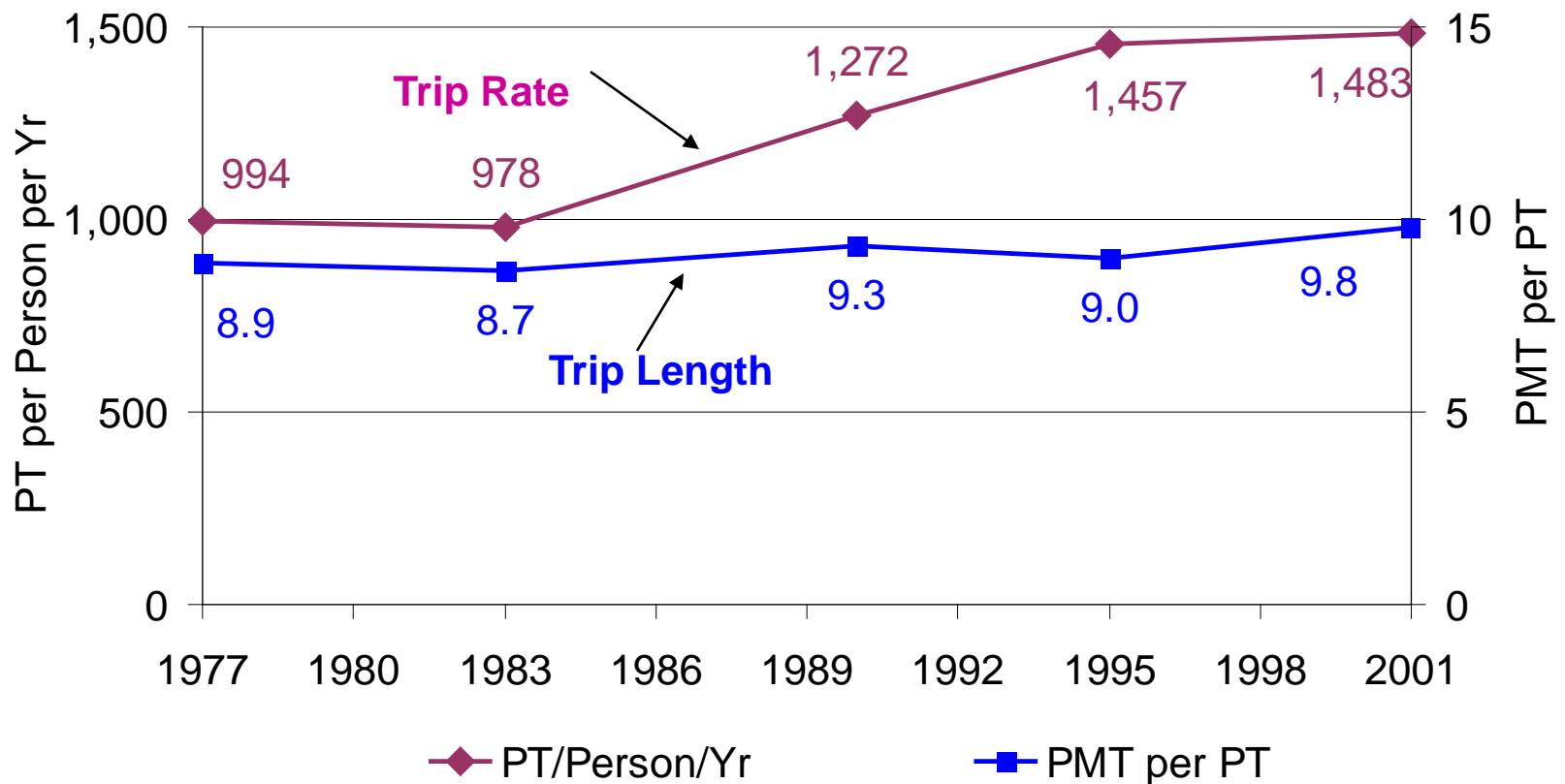
Declining Walk Shares



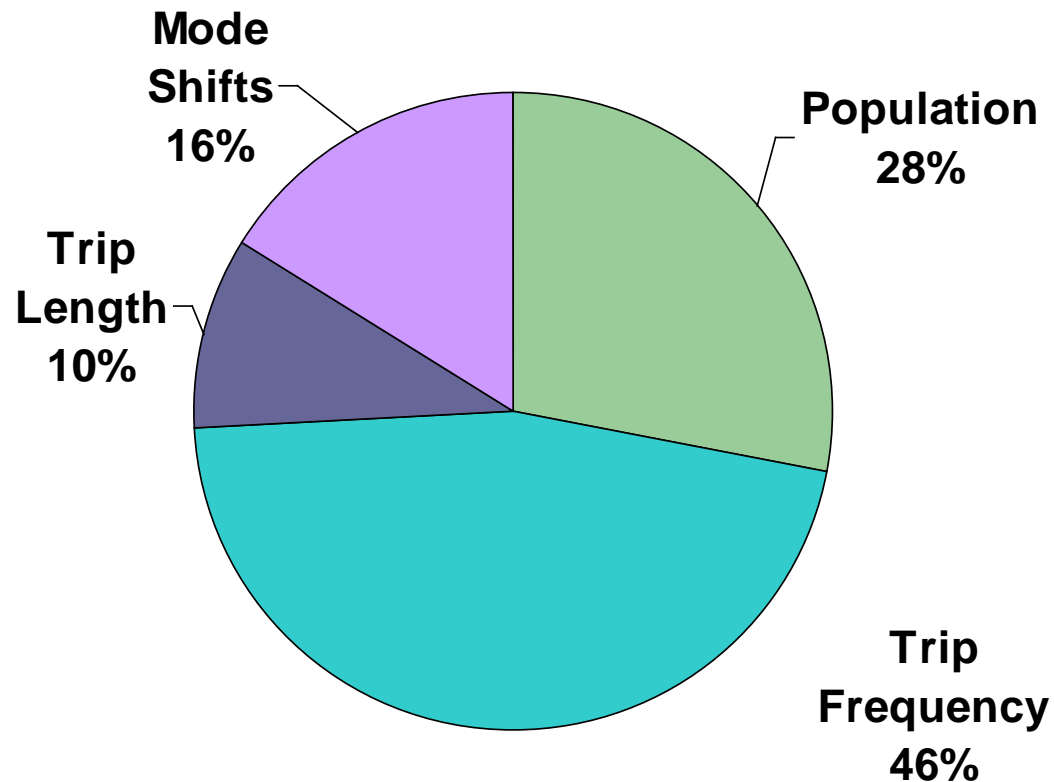
Ending the Decline in Transit Mode Share – Survey Data



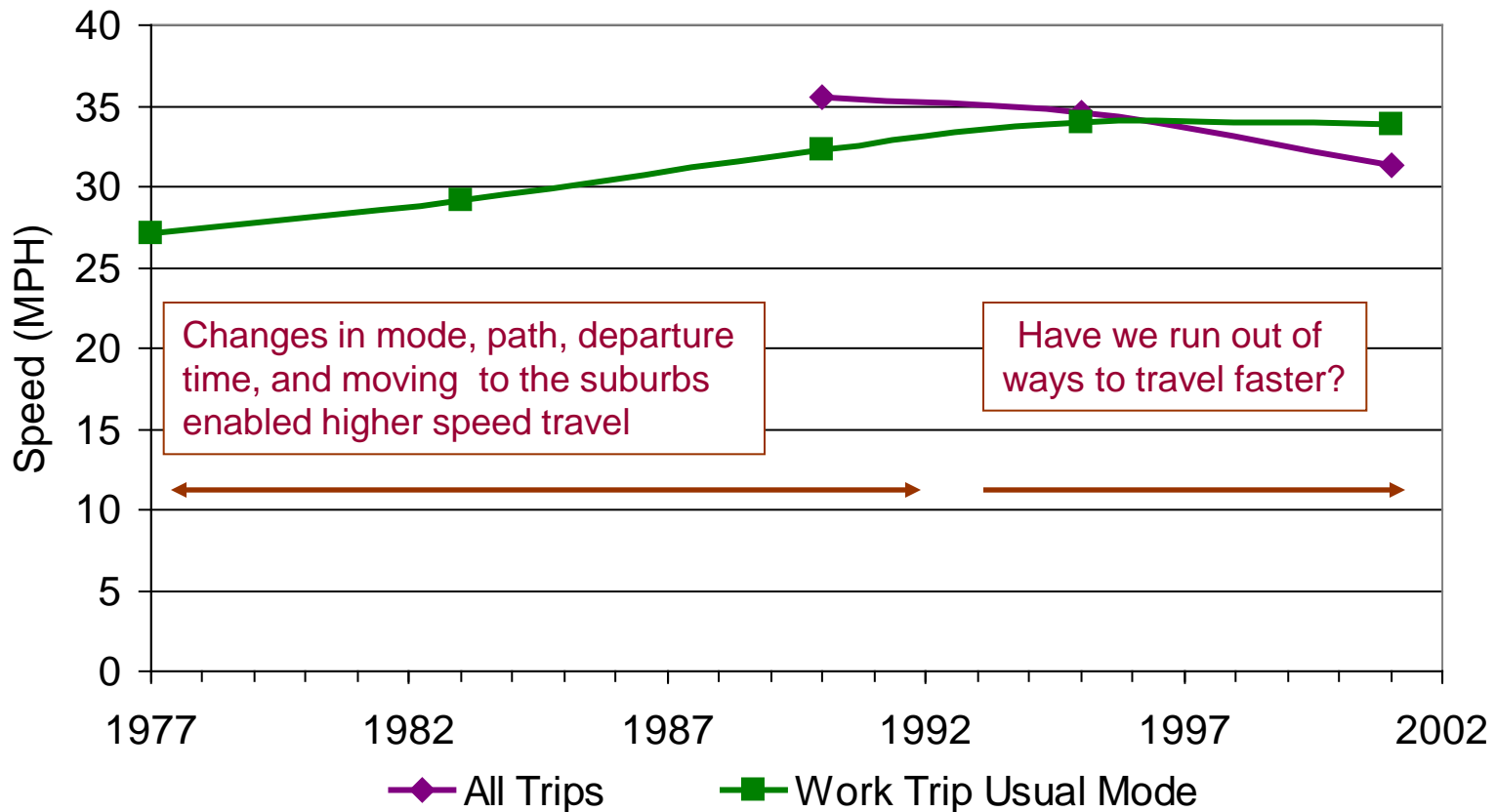
Person Trips per Person per Year and PMT per Person Trip



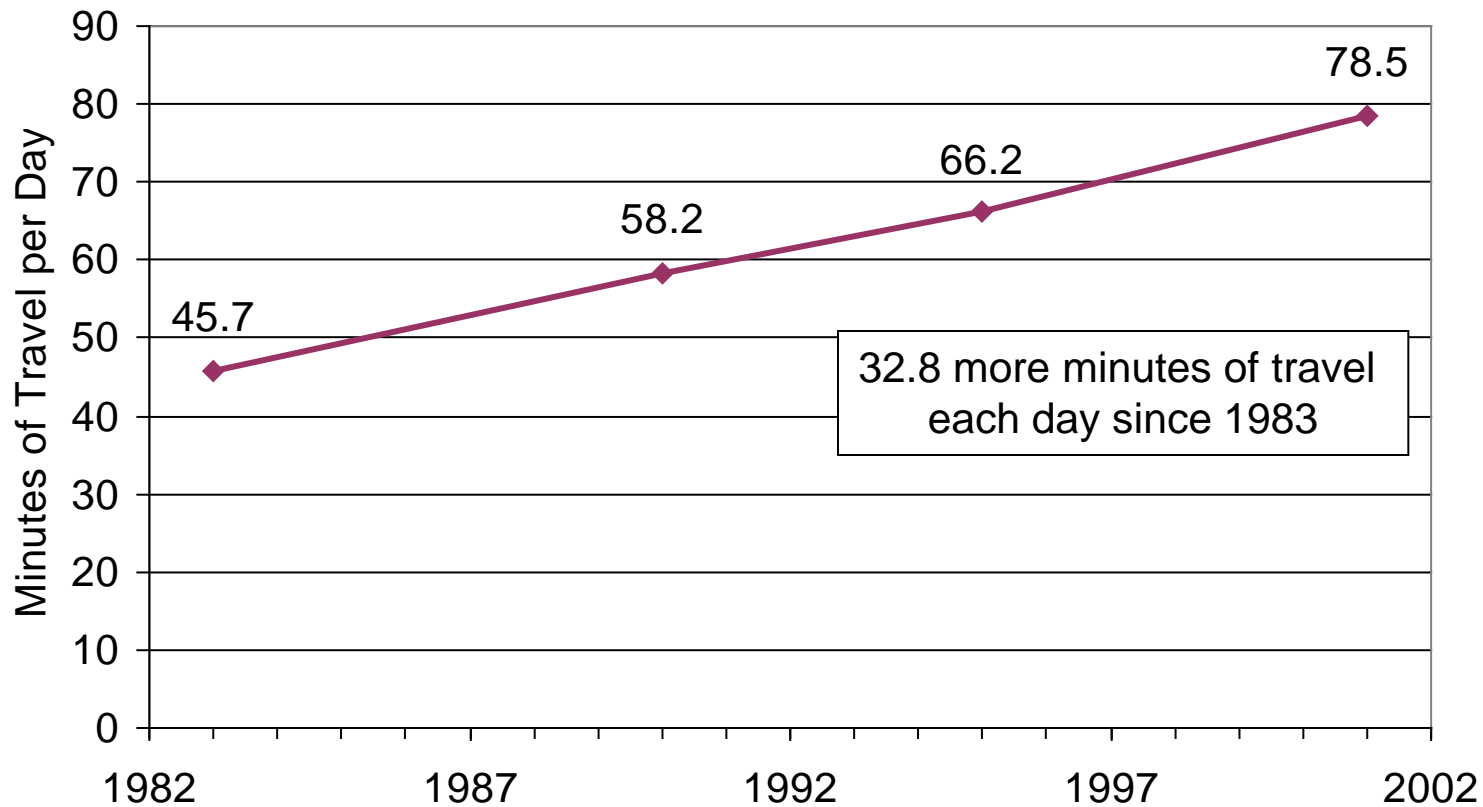
Factors Contributing to US VMT Growth 1977-2001



NHTS/NPTS Data Suggest Travel Speeds are Now Slowing



Travel Time Budgets Have Grown 1.8 Minutes per Day per Person per Year



What Might Change?

BUY ...CARBON CREDITS....

TICKET FARE \$2.50

Tickets



The image shows a man in a brown jacket and black pants standing at a station kiosk. The kiosk has a screen displaying 'BUY ...CARBON CREDITS....' and a sign above it that says 'TICKET FARE \$2.50'. The kiosk also has a 'Tickets' sign and a screen showing 'Search by Smart'. The man is looking at the screen. The background shows a station with turnstiles and a sign that says 'TICKETS'.



Travel Growth Due to Personal Income Growth

Elasticity of Travel with Respect to Personal Income Changes				
<i>Study</i>		<i>Percent change in per capita VMT for each 1% Increase in per capita personal income</i>		
NSTPRSC Forecasts		+0.39%		
Pickrell and Schimek (1999)		+0.35% to 0.37%		
2001 NHTS Derived (CUTR)	Trip Rate	Trip Length	VMT/PMT	Cumulative Impact
	0.1564	0.1178	0.0786	0.3940

Personal Income Impacts

- ◆ Will personal income grow at its historic rate of $\sim 1.5\%/year$?
- ◆ 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)

Activity Scale and Distribution

- ◆ 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.

Do Business Economics Contradict Travel Minimization

- ◆ 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.

A photograph of two men fishing on a pier. The man on the left is wearing a dark shirt and a cap, leaning over the railing. The man on the right is wearing a light blue shirt and a hat, standing upright. The background shows a large body of water under a clear sky. Two thought bubbles are overlaid on the image, containing text in pink. The first bubble is connected to the man in the dark shirt, and the second bubble is connected to the man in the light blue shirt.

**“They said we
need high
density to make
public transit
work.”**

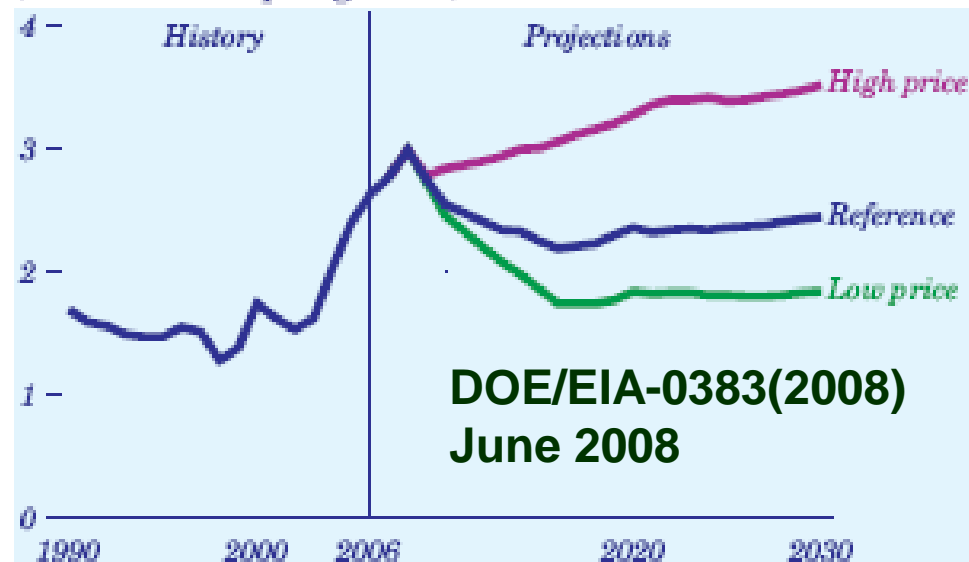
**“No, they said we need
public transit to make
high density work.”**

Future Travel Costs?

Liquid Fuel Prices

U.S. Motor Gasoline Prices Rise and Fall With Changes in World Oil Price

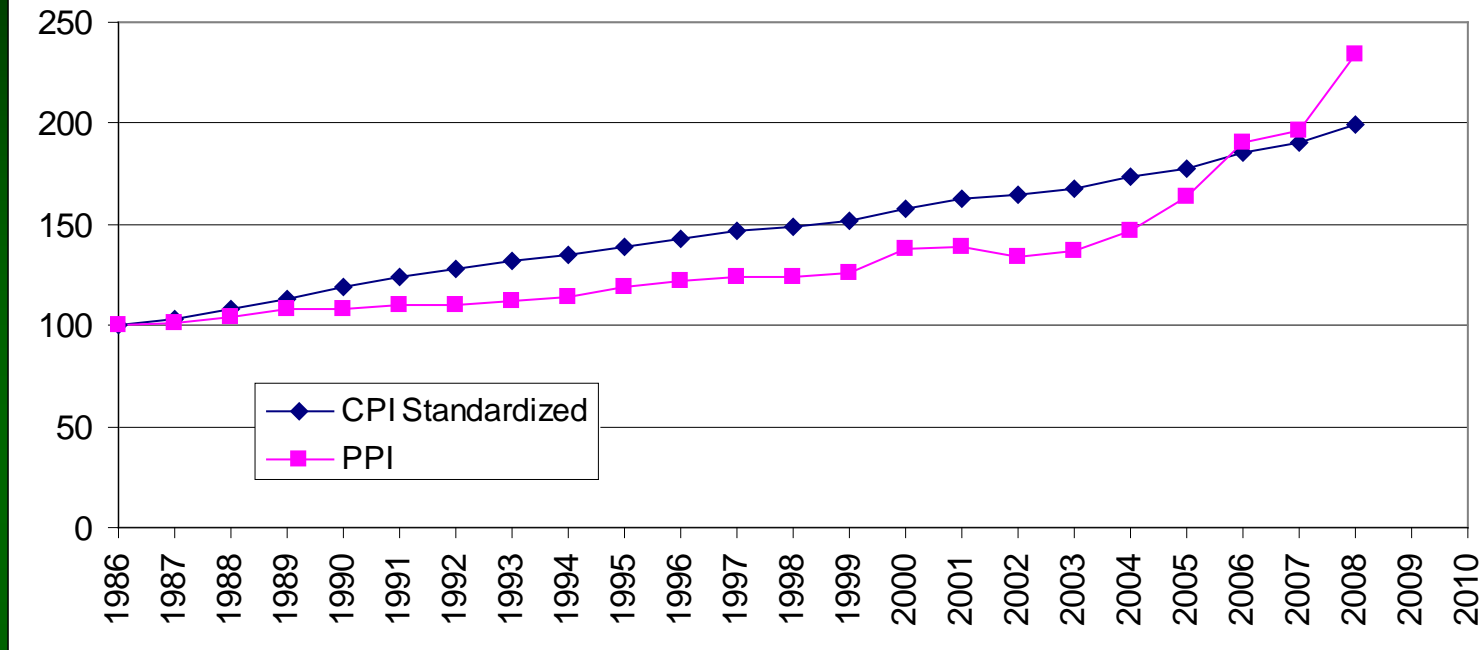
Figure 92. Average U.S. delivered prices for motor gasoline, 1990-2030 (2006 dollars per gallon)



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

Comparison of CPI and BHWY PPI



- ◆ 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 \approx \$0.95.
- ◆ LRT = \$0.60 operating and \$1.60 capital per pm \approx \$2.20.
- ◆ >75% provided by public funds \approx \$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.

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