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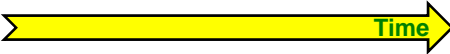
CENTER for URBAN
TRANSPORTATION
RESEARCH

What We Do and Don't Know About Vehicle Miles of Travel Trends

Steven E. Polzin, PhD
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Center for Urban Transportation Research | University of South Florida

Social and Economic Interactions Create Demand for Travel



Growth in:

- Income
- Knowledge

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Specialization in:

- Employment
- Consumption
- Social Relationships
- Time Use

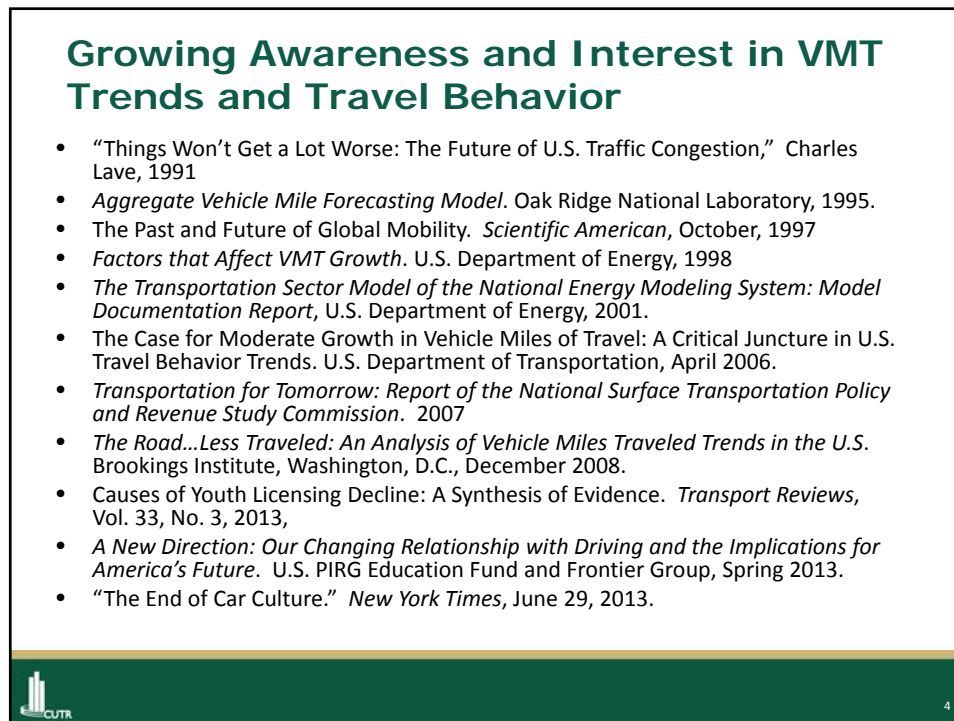
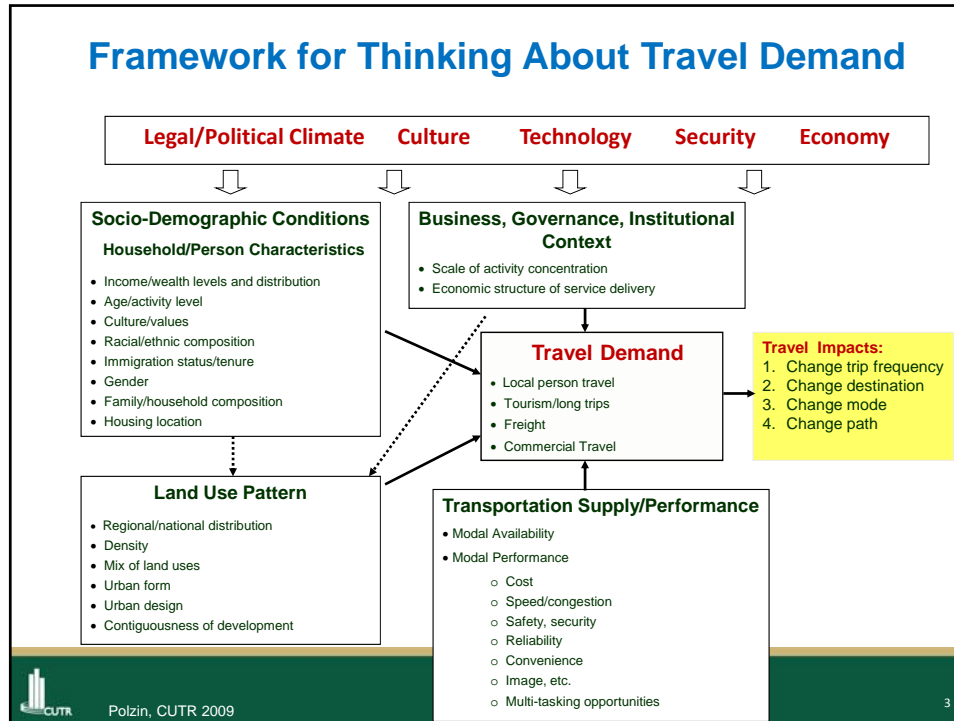
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Growth in:

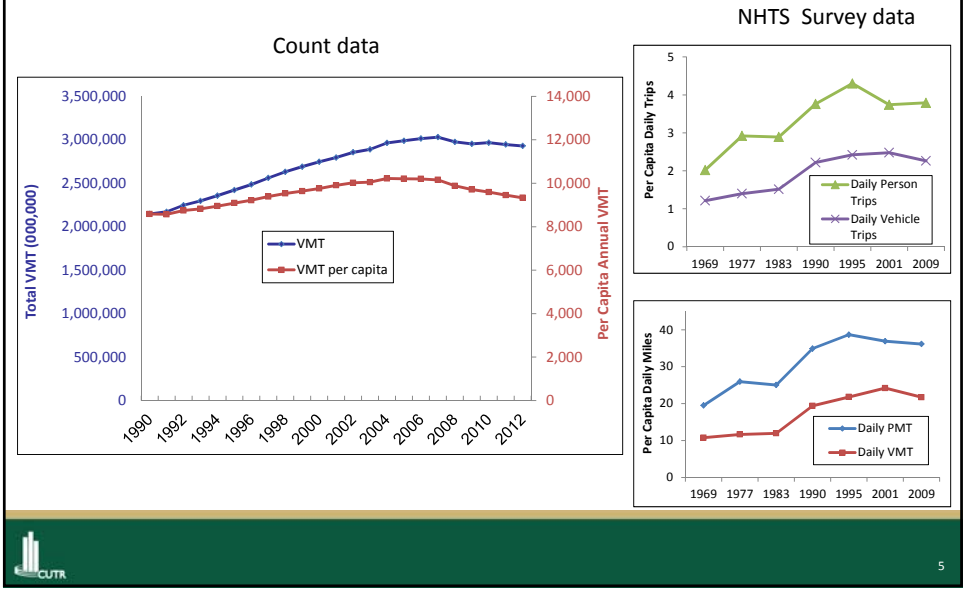
- Person Travel
- Commerce
- Communication



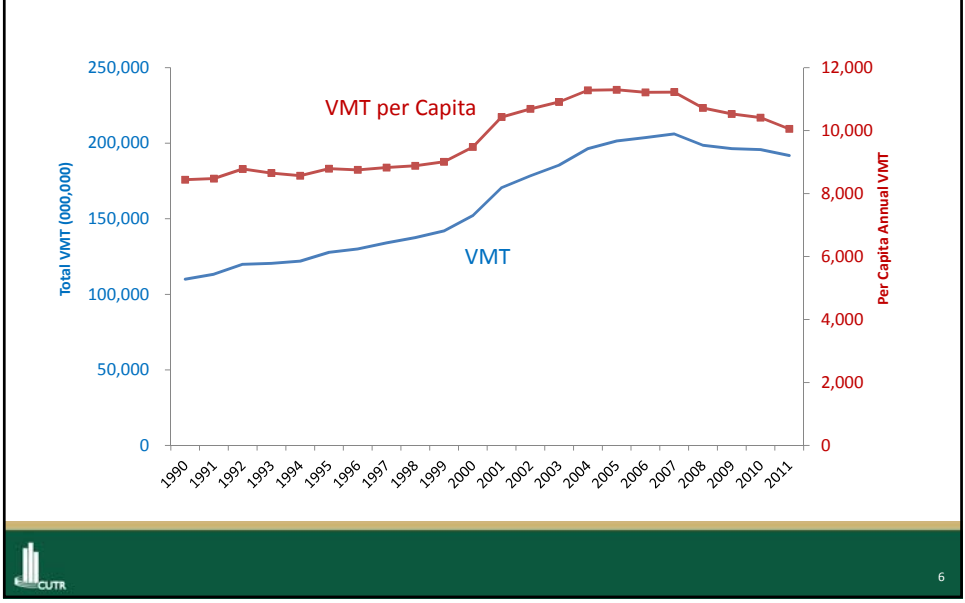
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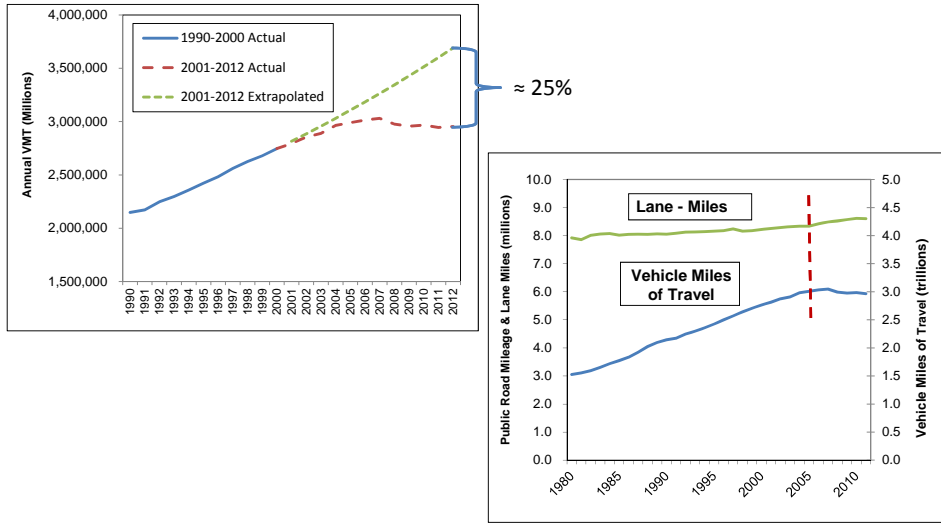
Trips, VMT and VMT per Capita Trends



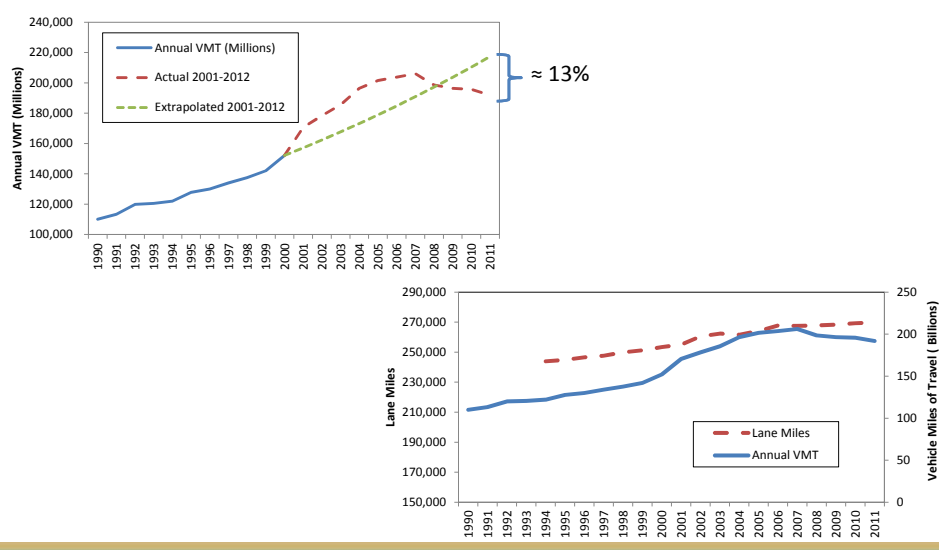
Florida VMT and VMT Per Capita Trends



Changes in VMT and Capacity – U.S.



Changes in VMT and Capacity – Florida



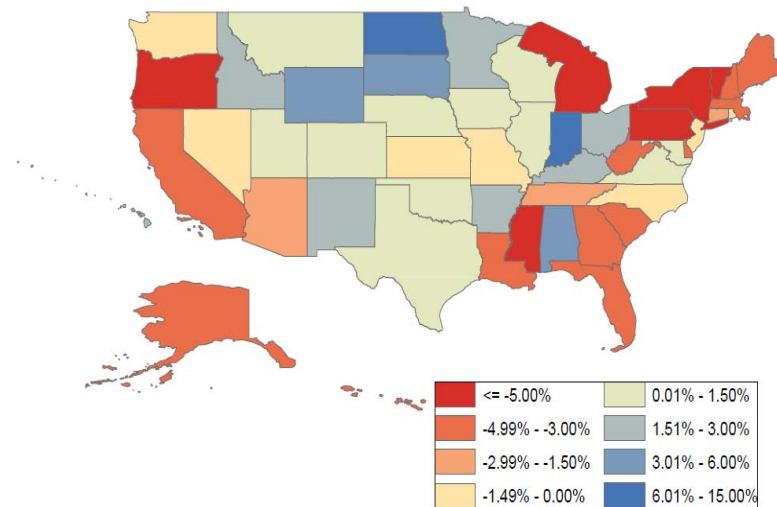
Person Travel in Perspective

	<i>Private Vehicle Travel 2009</i>	
	Percent of VMT	Percent of Total Roadway VMT
Household Travel		
Commuting	27.8	76 ^a
Work-Related/Business Travel	9.0	
Other Resident Travel	63.2	
Subtotal	100%	
Public and Commercial Travel		
	Public Vehicle Travel	2 ^b
	Utility/Service Travel	12 ^c
Freight and Goods Movement Travel		
		10 ^d
	Total	100%

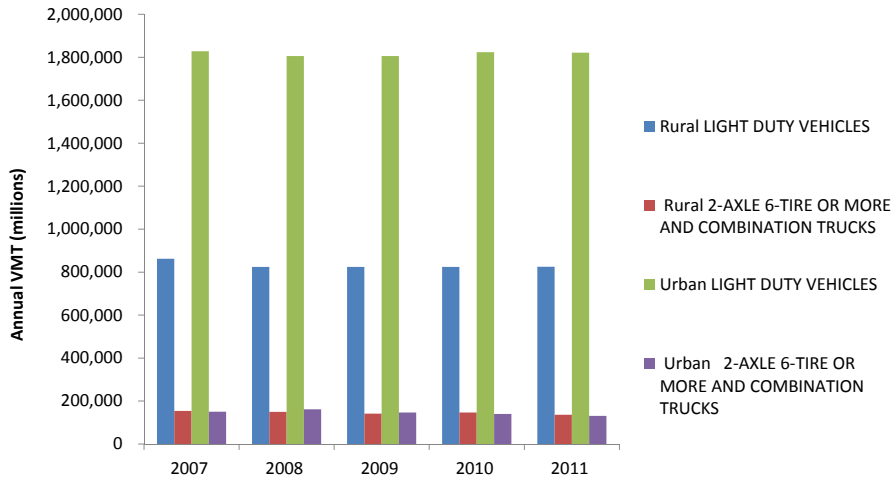
Sources: CIA 2013, Brief 2,
 NHTS 2009, FHWA State Statistical Abstracts, FHWA
^aFHWA estimate based on NHTS data.
^bFHWA estimate using vehicle registration data.
^cFHWA estimate based on HPMS data and NHTS.
^dFHWA estimate based on HPMS data



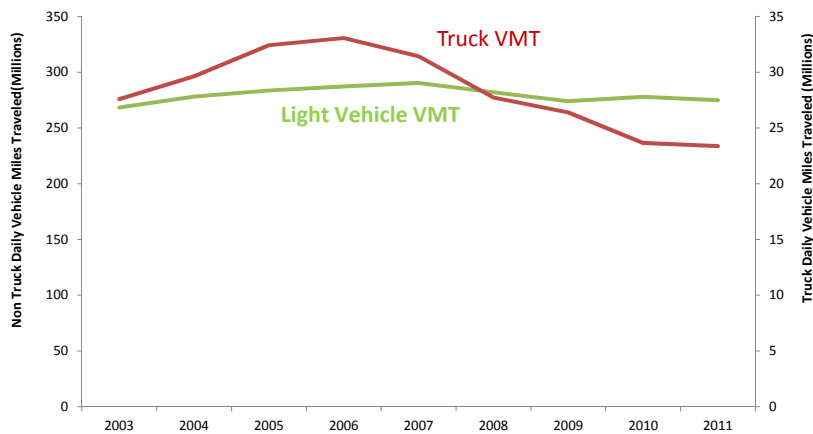
VMT Change by State, 2007– 2012



Truck Versus Light Vehicle VMT Trends



Florida Data on Truck and Light Vehicle VMT Trends



Urban Versus Rural VMT Trends

As of 2011, 33% of VMT was rural:

- Rural accounts for 2.9% of the total 4.2% decline in VMT since 2007.
- Heavy vehicle VMT accounts for 30% of the rural VMT decline.
- Rural – typically longer distance trip travel – is an expected reduction area due to fuel prices and economic stress.
- Reduced travel on rural facilities is partially attributable to less long distance commutes and social/recreation travel by urban residents.



13

Urban Versus Rural VMT Trends

As of 2011, 67% of VMT was urban:

- Up 1% in share since 2007
- Urban accounts for 1.3% of the total 4.2% decline in VMT since 2007.
- Heavy vehicle VMT accounts for 74% of the urban VMT decline.
- Urban light vehicle declines accounts for only about 8% of total VMT declines from 2007-2011.



14

Mode Shifts and VMT Trends

- Based on person miles, increased transit use can explain $\approx 5.6\%$ of urban light-vehicle declines in VMT.
- Carpooling continued to decline but overall occupancy increased 2% from 2001 to 2009.
- Bike and walk combined constitute less than 1% of total person miles of travel thus changes are not meaningful in explaining VMT changes.
- Domestic airline travel (PMT) declined by 1/10 of 1% between 2005 and 2012.
- Amtrak and intercity bus are an order of magnitude too small to influence VMT meaningfully.



15

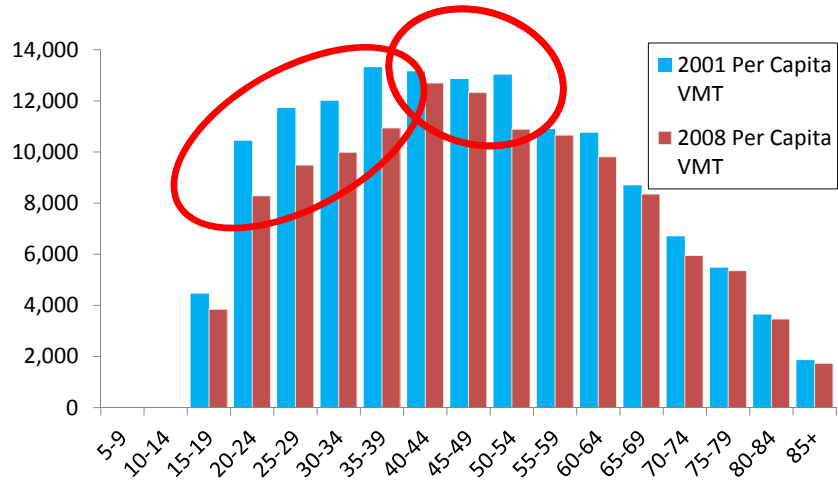
The Majority of Urban Per Capita Travel Reductions are from Trip Rate and Trip Length Changes

- Between 2001 and 2009 (NHTS reference points) the person trip rate declined 4.4 percent and the trip length declined 6.2 percent.
- Work at home increased from 3.26 percent in 2000 to approximately 4.33 percent of the workforce in 2011.



16

PMT and VMT per Capita by Age



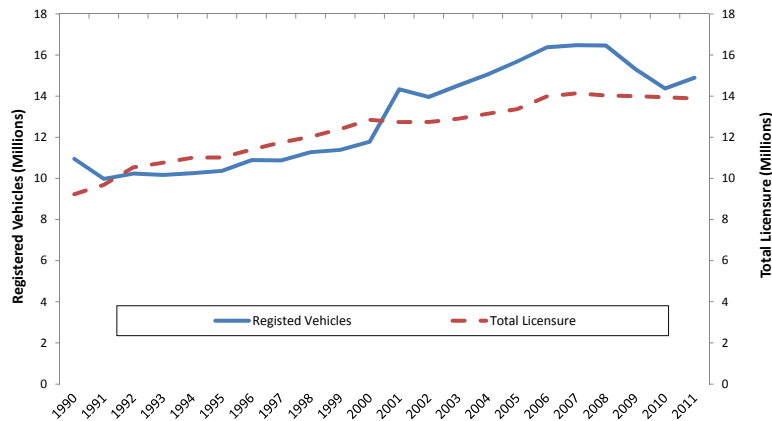
International Trends in Licensure by Age



Figure 1. Young people driver licensing trends from international data. Source: Raimond and Milthorpe (2010), Kuhnimhof et al. (2012a), Sivak and Schoettle (2012a, 2012b), and Delbec and Curtis (2013).



Florida Licensure and Registered Vehicles Trends



19

Licensure by Age

The AAA Foundation surveyed a random sample of 1,039 young people ages 18-20 to investigate the ages at which they obtained licenses, and reasons for waiting to obtain a license among those who were not licensed within 1 year of their state's minimum age.

- 44% licensed within 1 year of minimum age, 54% licensed before turning 18.
- Strongest predictor of delayed licensing was low household income.
- Racial and ethnic differences still present after controlling for income.
- Most cited not having a car, costs associated with driving, and ability to get around without driving as main reasons for not getting licensed sooner.
- Little/no support for hypotheses from previous studies regarding GDL, social media as important reasons for low licensing rates.



20

Understanding Weak Travel Demand for Millennials

- Economic conditions:
 - Very high unemployment
 - High college/school loan debt
 - Limited compensation due to competitive job market, etc.
 - Economic stress limits the ability to carryout some activities and is exacerbated by higher fuel costs.



21

Understanding Weak Travel Demand for Millennials

- Different composition than did the young workforce decades earlier:
 - Delayed marriage
 - Median age of marriage went from 23.2 (m) and 20.8 (f) in 1970 to 28.2 (m) and 26.1 (f) in 2010
 - Delayed start of family
 - Average age of first-time mothers increased 3.6 years from 1970 to 2006, from 21.4 to 25.0 years.
 - Delayed homeownership
 - According to Post Office Mortgages report, the average age of first-time homebuyers has increased from 23 in the 1960s to 35.
 - More minority, more likely to be born outside of the US
 - In 1960, 4% of children were born to foreign born mothers versus 21% in 2010, Pew Research)
 - More urban
 - More likely (perhaps) to have come from a lower income household less able to provide parental financial support for education, car and homeownership



22

Understanding Weak Travel Demand for Millennials

- Value differences:
 - Substitutes communication technology in lieu of travel
 - Does not see vehicle ownership being a path to freedom and independence
 - Four siblings in a 1500 sq ft home is different than 1 sibling in a 2500 sq ft home
 - Does not depend on travel as an enabler of socialization
 - Applies different sensitivities to environment



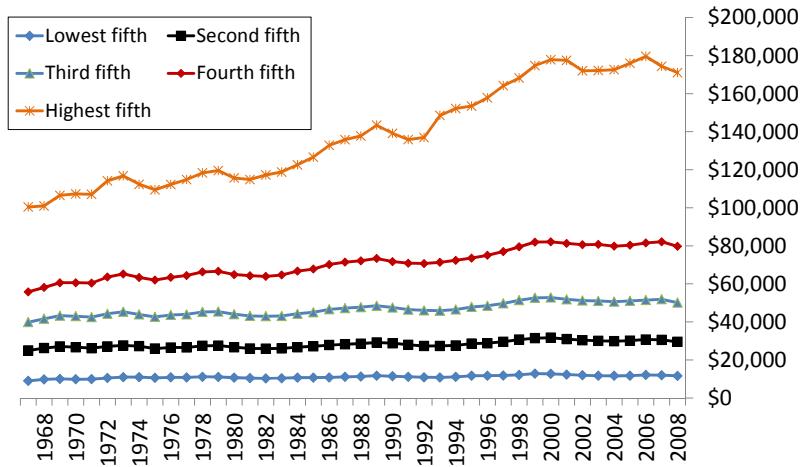
Americans' Mobility Aspirations?

First thing I'm going to do is sell my big pickup truck and go for a walk

I'm not going to Disney. I'm going to stay home and watch the Disney Channel on the Big Screen

I'm selling the suburban house where the grandkids come for holidays and buying a little downtown condo.

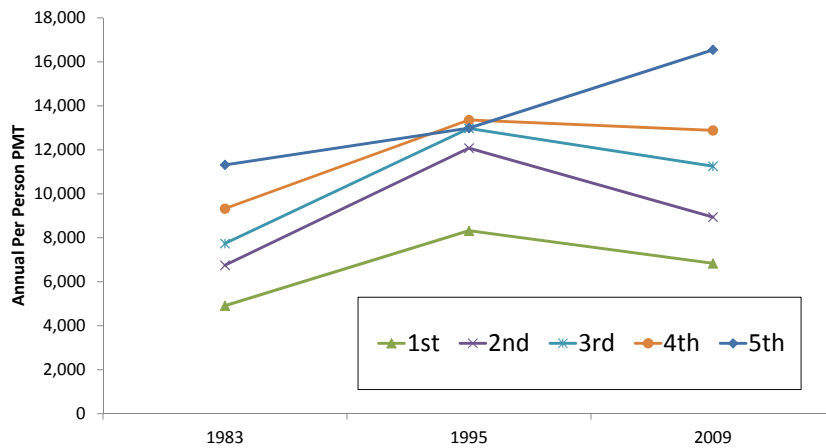
Mean Household Income Received by Each Quintile 1967 to 2008



Census 2008 dollars

25

PMT by Income Quintile



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26

Knowledge Constraints (Travel Theory)

- Weak understanding of linkages between components of GDP and person and freight travel
- Limited insight on how wealth, discretionary income, and total income affect travel now (post vehicle saturation)
- Limited understanding of travel satiation, induced travel, response to travel time costs/constraints



27

Knowledge Constraints (Travel Theory)

- Limited understanding travel implications of social interaction as it has shifted from home-based to work-based to web-based
- Weak understanding of the communication substitution factors (customer acceptance/market penetration, critical mass, etc.)
- Limited understanding of the stability and impact of environmental, personal health, safety sensitivity and other value considerations on travel behavior
- Limited understanding of household travel changes as household composition changes (more independent economic units in same household).



28

Data Constraints (Travel Data)

- Frequency of comprehensive **travel survey data** is limited (NHTS)
- Limited knowledge regarding a significant share of **nonpersonal travel** (Public Vehicle Travel, Utility/Service Travel)
- Limited knowledge (or low visibility) of changes in **freight travel** (volume changes vs. trip length changes vs. logistics vs. mode shifts) yet very high impact on congestion, infrastructure, energy
- Limited synthesis of **local travel surveys** to discern trend shifts or comprehensive picture (are trends in trip generation data confirming the trends in survey based trip rates?)
- Limited understanding of **long distance or non-routine person travel**



29

Data Constraints (Demographics)

- Conflicting and contradictory data on **locational trends** of millennials and seniors.
- Conflicting and contradictory data on **growth trends** for urban, suburban and non-urban areas.
- Limited understanding of **household composition** changes.
- Confusion between:
 - *traveler stated preference,*
 - *traveler revealed behavior* and
 - *author preference based on anecdotal data* regarding population, employment location and behavior trends.



30

Data Constraints (Economics)

- What is the new normal
 - GDP growth by Sector:
 - Personal (durables, non-durables, services)
 - Distribution across income quintiles
 - Private domestic investment
 - Net exports
 - Government expenditures
 - Changes in employment
 - Part time/full time
 - On-site versus telecommute
 - Labor force participation



Summary

Several historic trends that have supported growing VMT have played themselves out:

- labor force participation
- vehicle ownership and licensure levels,
- migration from city to suburbs
- shifts to personal vehicle

It's premature to discern the magnitude of new trends due to limited data, limited knowledge or relationships and limited ability to forecast future values for input variables.

The decline in demand has postponed the sky-is-falling gridlock scenarios for at least two decades



So what might help?

- Travel options (to auto) will fare better if the high fixed, low **variable cost of auto ownership** changes.
- To influence travel behavior, **transportation revenues should be user based** with transparency
 - Trend is away from that to general funds, land use value capture, etc., that do not have feedback to travel behavior.
- Delivery of services and products continue to experience **economy of scale** by consolidation at the cost of additional travel (retail, schools, services, healthcare, etc.).



33

So what might help?

- We don't know what the consequences of **autonomous or connected smart vehicles** will be
 - what enhanced capacity
 - what new deadhead and latent travel demand.
- Be aware of the **unintended consequences** of desired changes
 - How often is a shift to transit more energy efficient?
 - Will lower auto ownership minimize travel or dampen new technology adoption?



34

Other Strategies for Activist Planners

- Reorganize sports conferences to minimize travel. Don't give out tickets to the visiting team.
- Require divorcing couples with kids to do an environmental impact statement on the visitation/shared custody transportation plan.
- Require annual leave to be used in two week blocks to avoid those energy intensive weekend getaways.



35

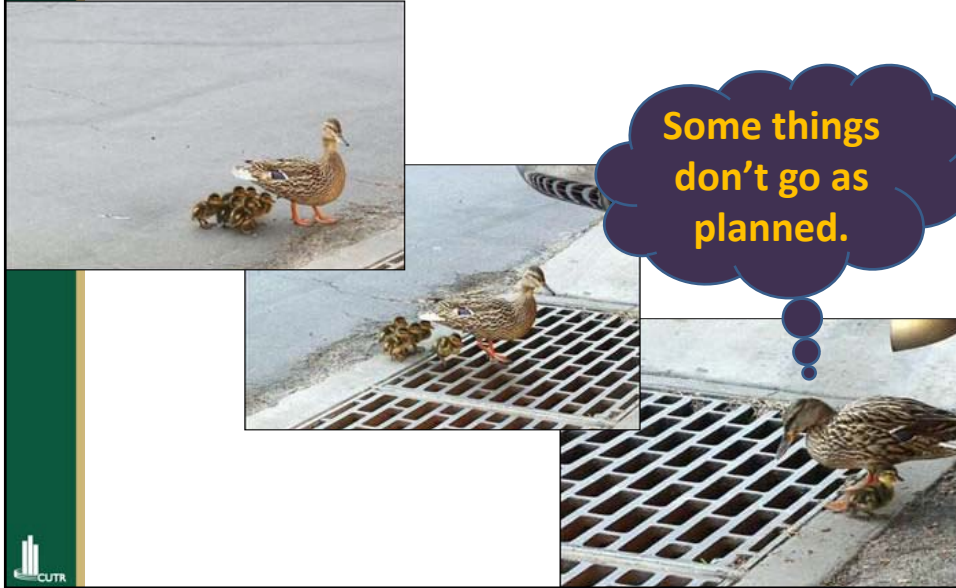
Other Strategies for Activist Planners

- Make house swapping practical and cheap to enable optimization of household travel.
- Outlaw youth sports travel teams.
- Ban trips to doggy day-care. Ban any trips to serve pets with a "doodle" in the name
- Standardize restaurant menus so no one is motivated to travel across town to a different restaurant.
- Price airline tickets by the pound-mile.



36

As You Prepare for the Future, Remember:



Contact Information

Steve Polzin

Director, Mobility Policy

Center for Urban Transportation Research

University of South Florida

813-974-9849

polzin@cutr.usf.edu