

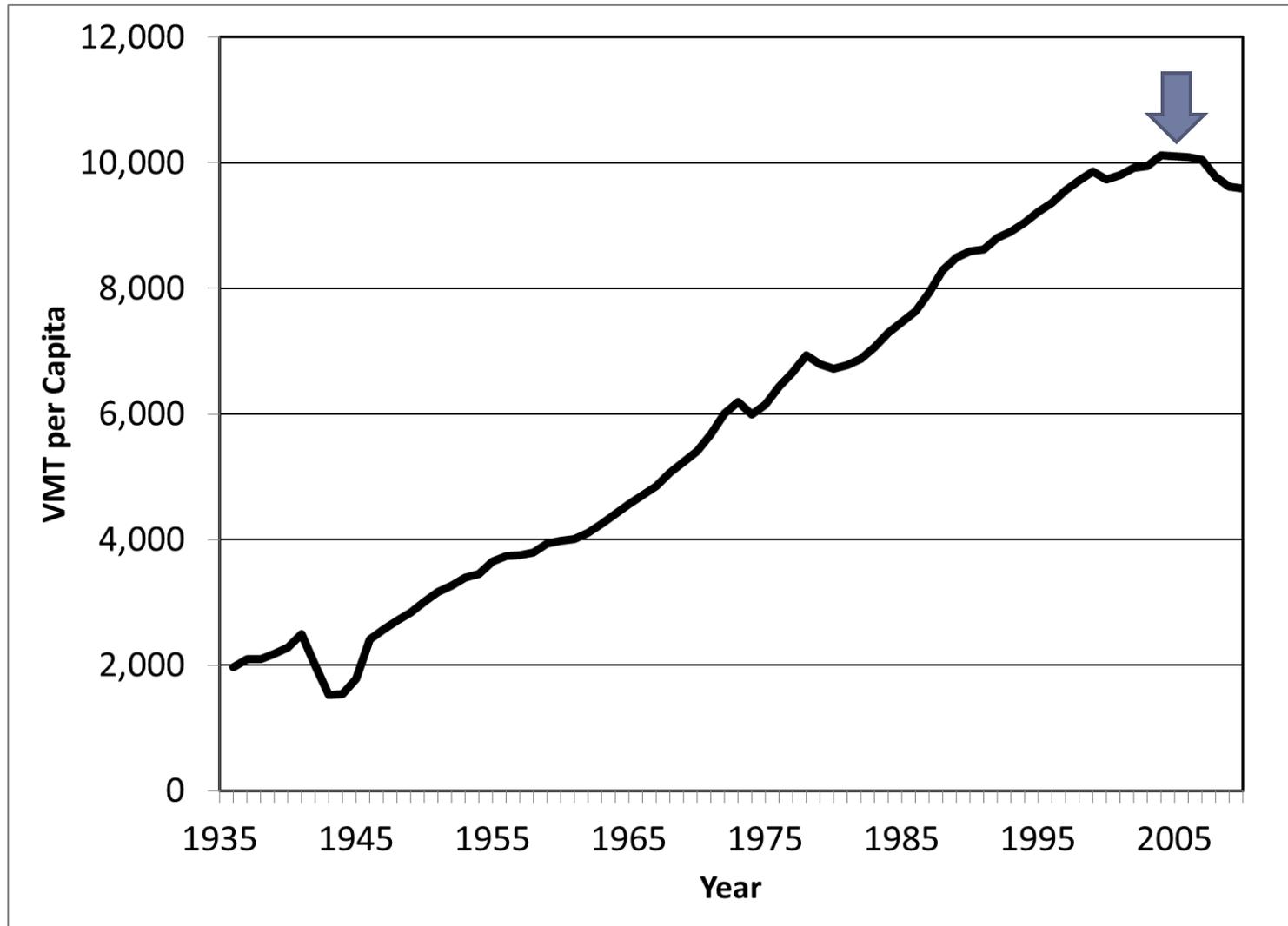
# **Peak Car Travel :** An Analysis of Trends in the National Capital Region

**Ryan Westrom**, District Department of Transportation

**Tim Garceau**, University of Connecticut Geography

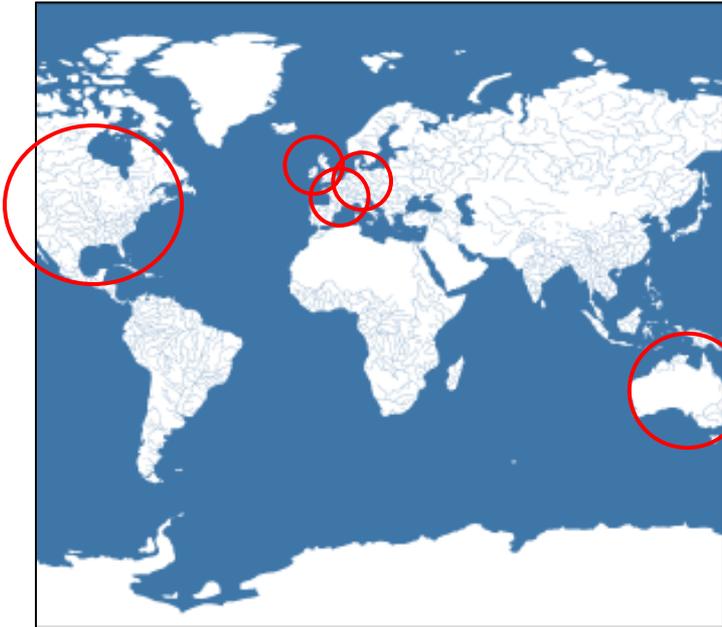
Friday, March 20, 2015

# What is Peak Car Travel?

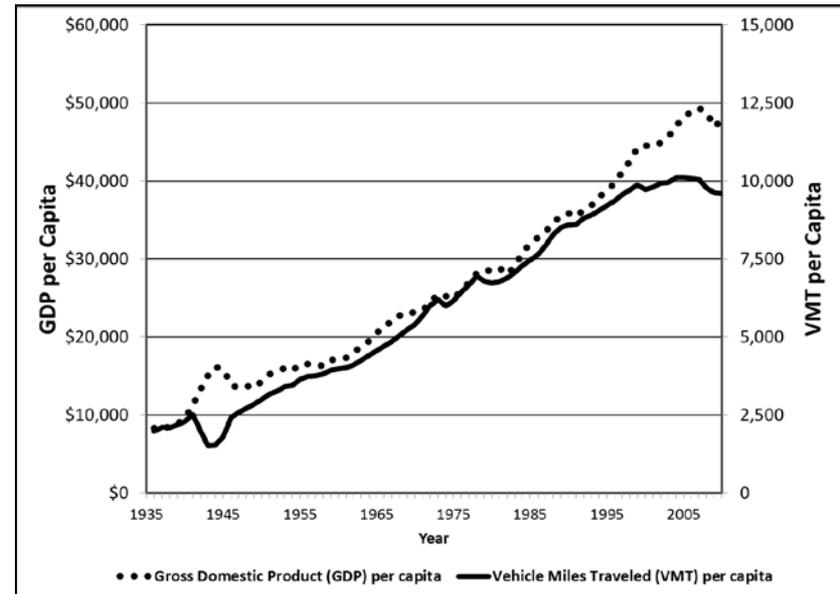


Nationally

# Existing Research



Peaks identified  
nationally &  
internationally



Decoupling from  
GDP

# Unknowns

## Causes of Peak Car Travel:

- ▶ Great Recession of 2008?
- ▶ Back-to-City Movement?
- ▶ Information Communication Technologies?



## Nature of Phenomenon:

- ▶ Temporary or Permanent?

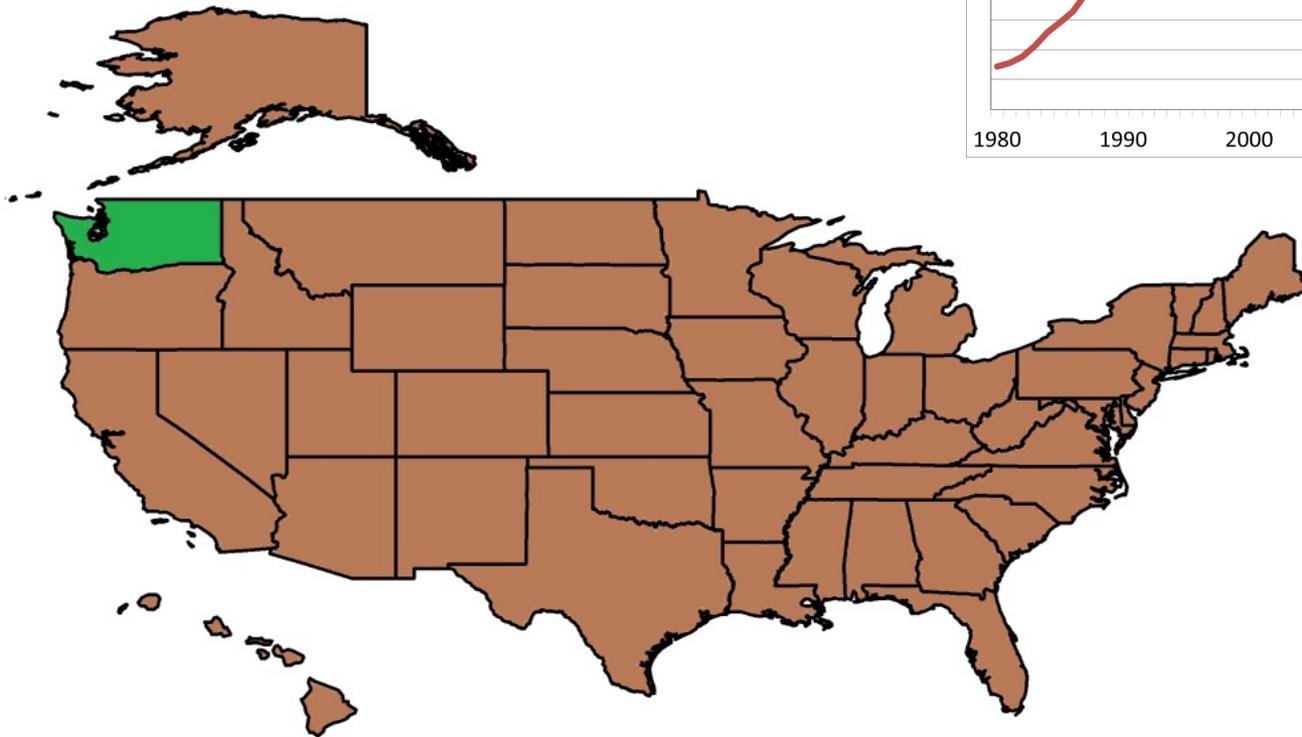
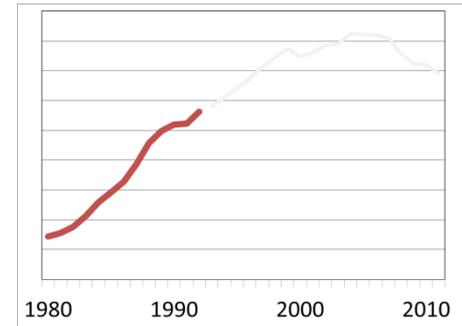
# ITE President's Message, 2012

“So will VMT continue its slight downward trend, or will it turn upwards and rejoin the economic activity trends? All of these factors will need to be weighed to make proper recommendations for future decisions.”

-Rock Miller, Former President, Institute for Transportation Engineers

# State-Level Patterns: 1992

National VMT/Capita

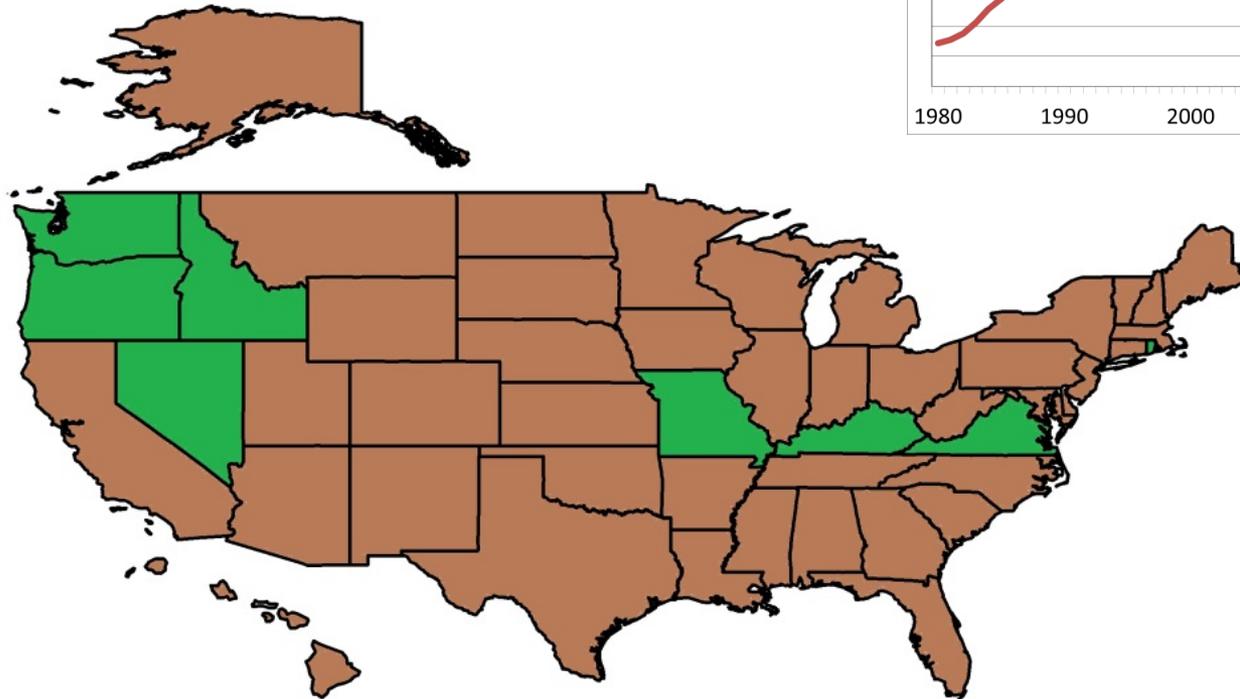
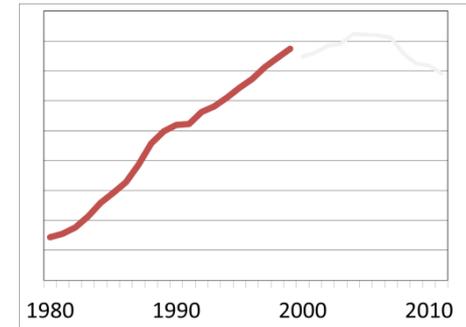


 Increasing / Has Not Peaked

 Peaking / Below Peak Level

# State-Level Patterns: 1999

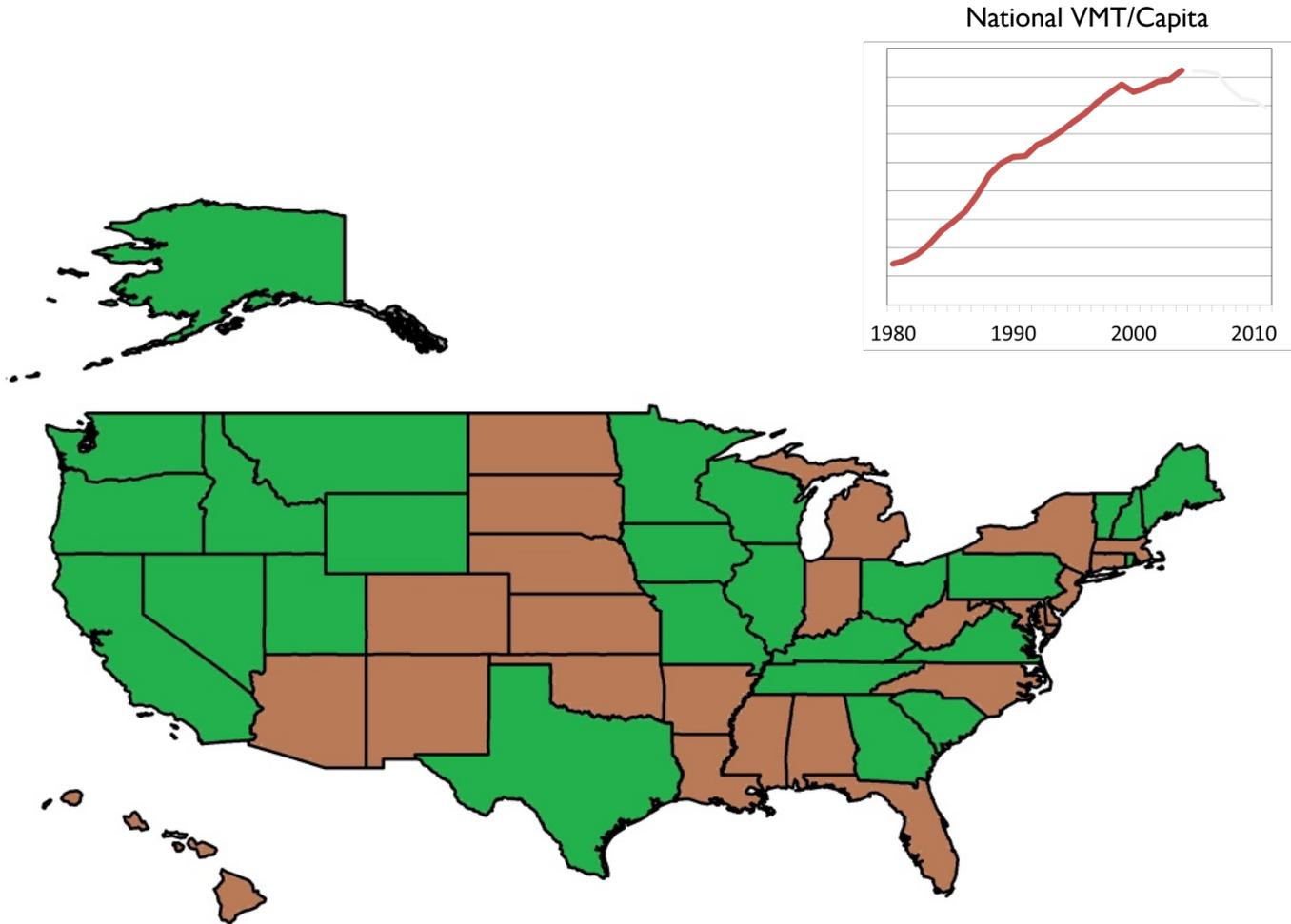
National VMT/Capita



 Increasing / Has Not Peaked

 Peaking / Below Peak Level

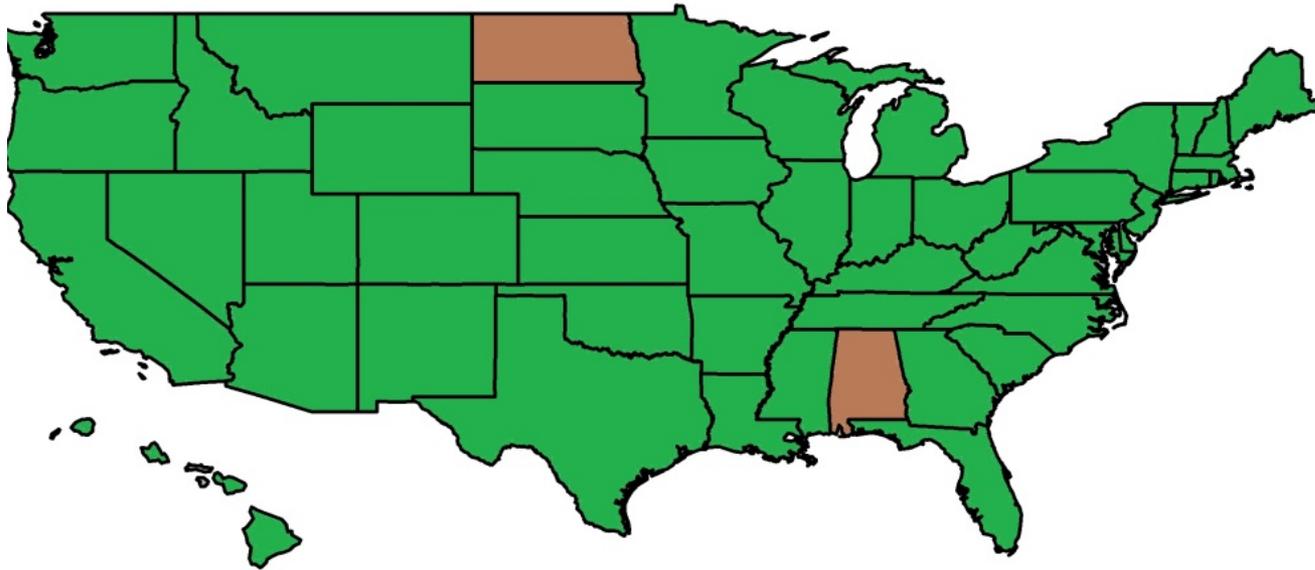
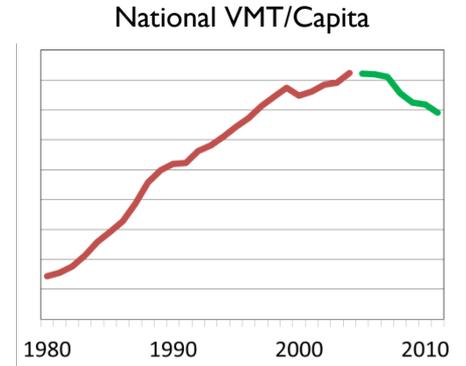
# State-Level Patterns: 2004



 Increasing / Has Not Peaked

 Peaking / Below Peak Level

# State-Level Patterns: 2011



Increasing / Has Not Peaked



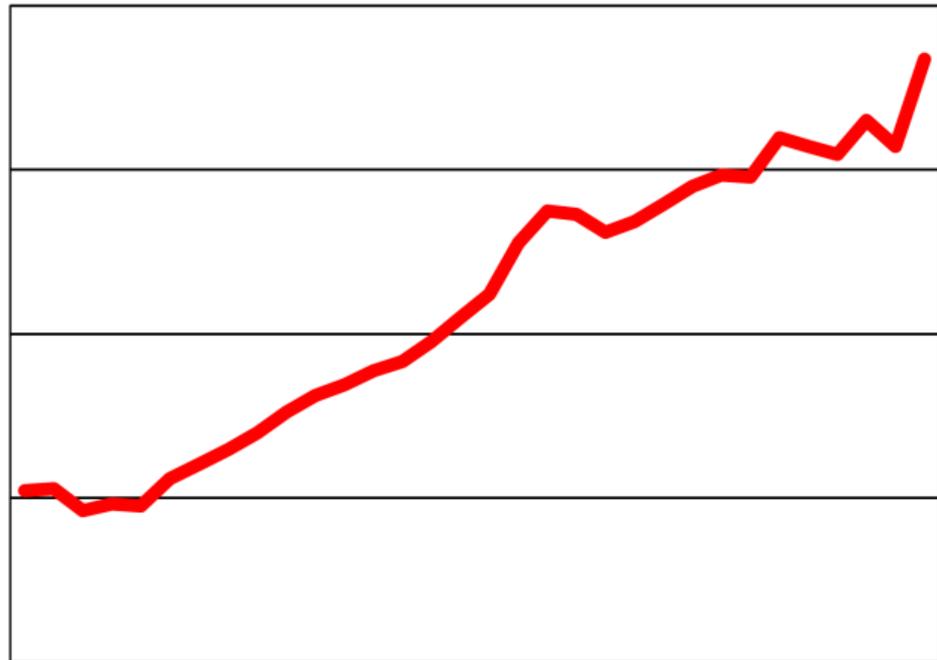
Peaking / Below Peak Level

# Non-Peaking States

2

states

- ▶ Continued overall increases
- ▶ Alabama & North Dakota

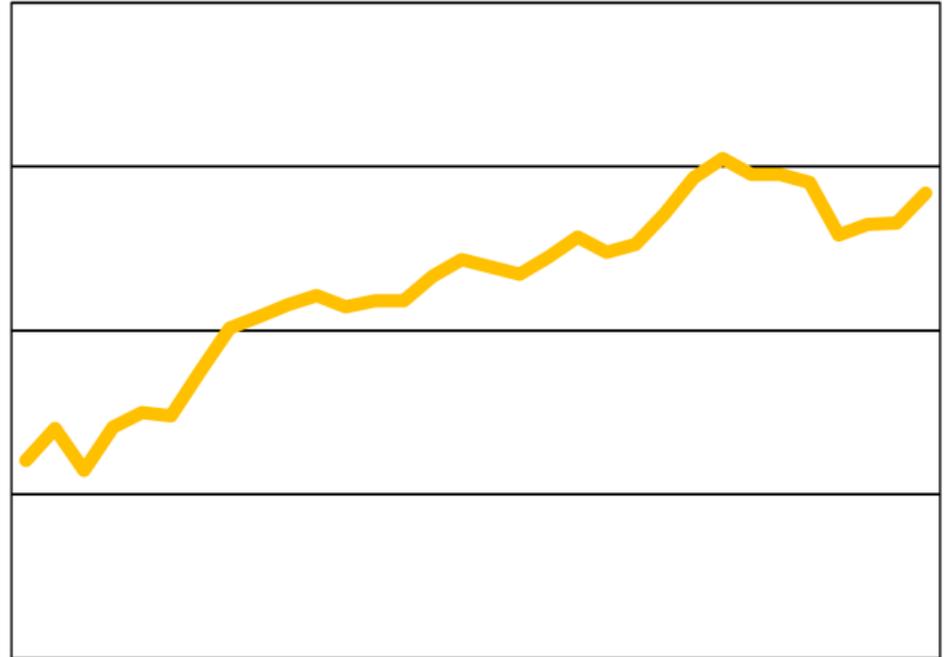


# Peak, Dip & Rise

8

states

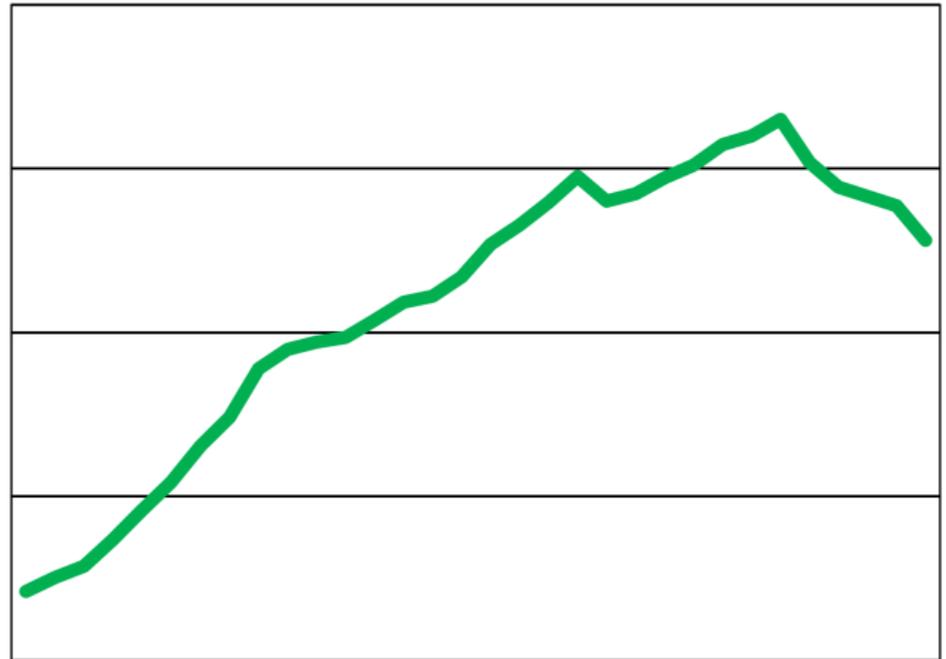
- ▶ Peak & Decline
- ▶ Now increasing, still below record-high peak



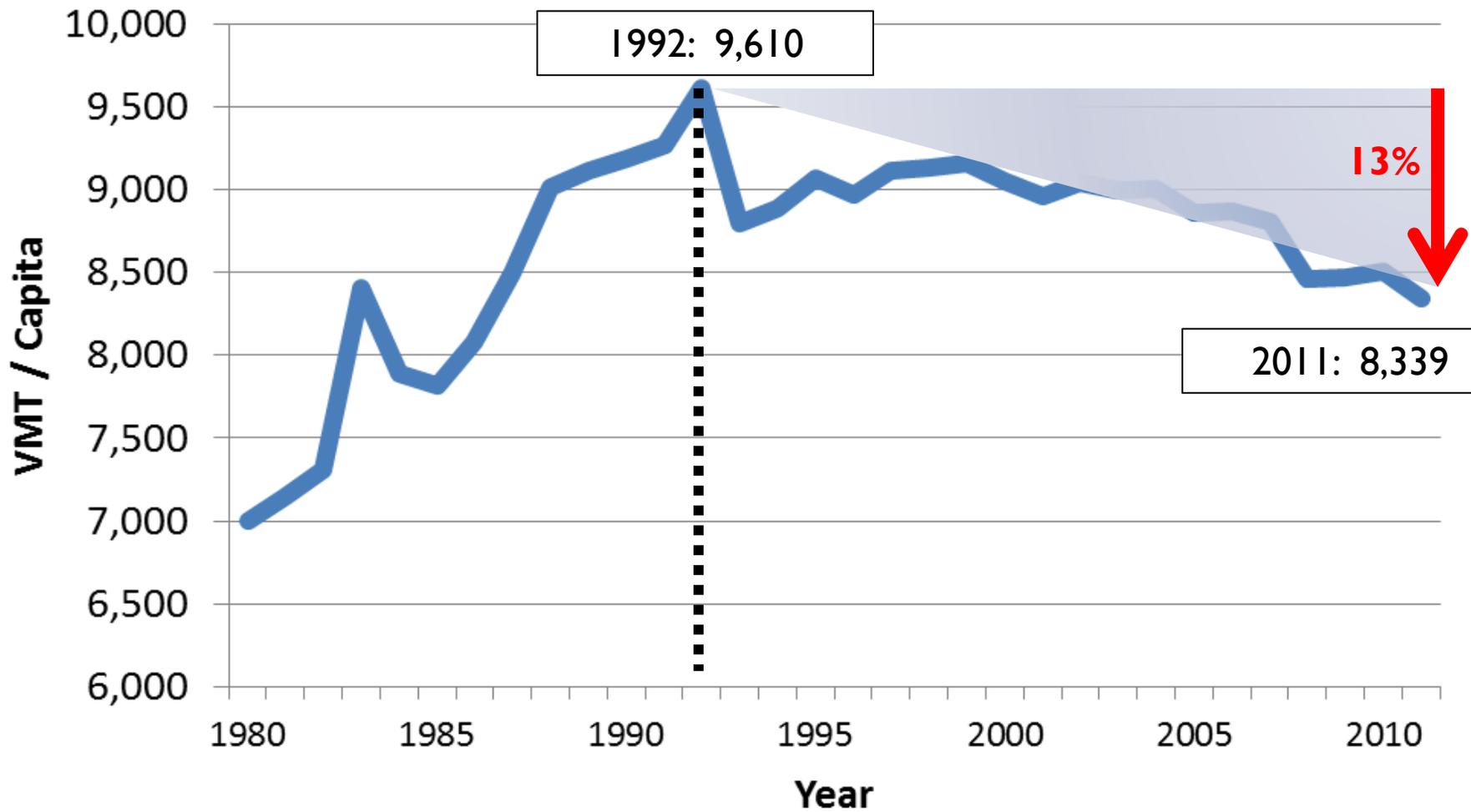
# Peak & Decline

**41**  
states

- ▶ Record-high peak
- ▶ Continued overall decline



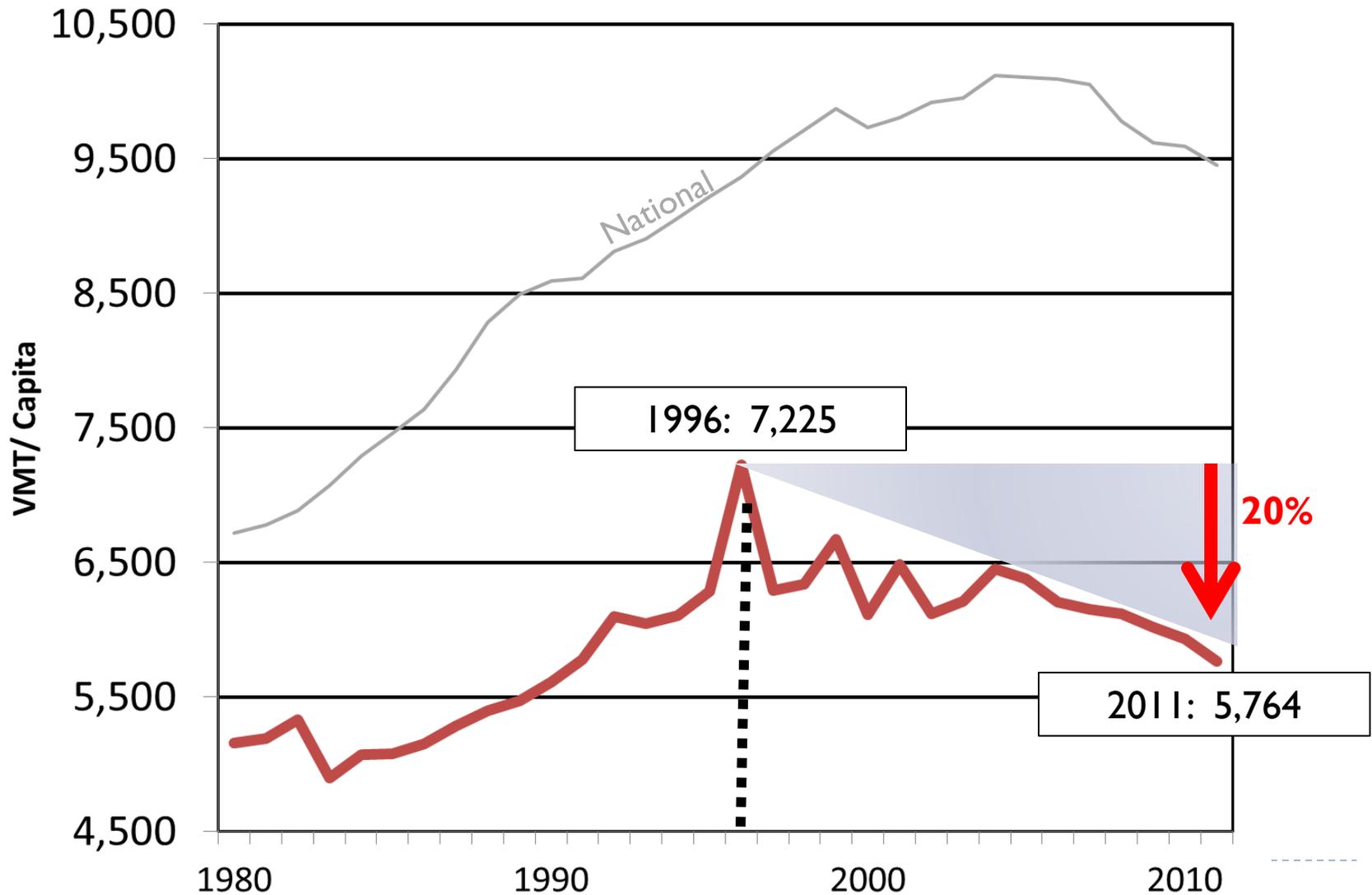
# First Peak: Washington State



# Washington, D.C.:

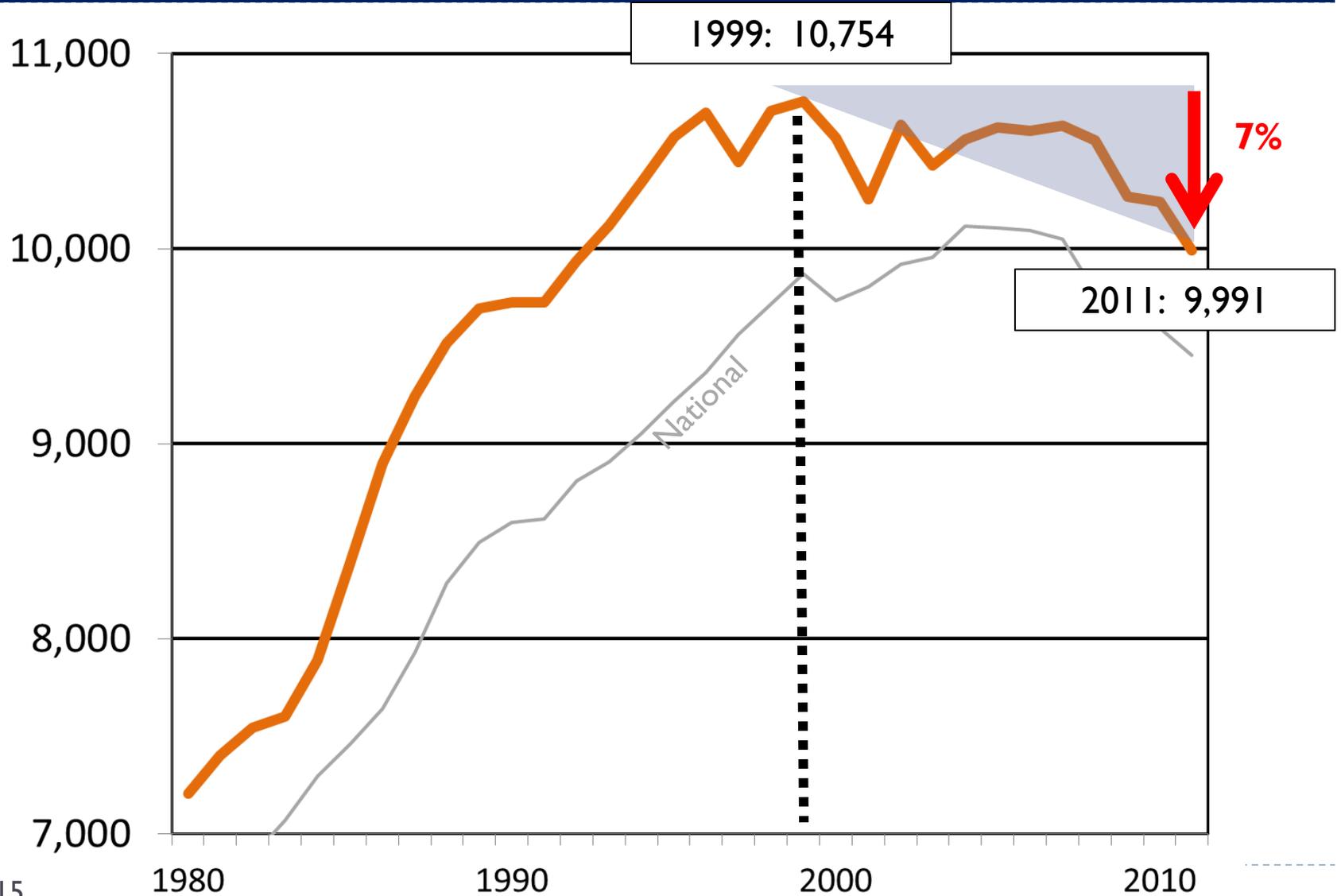
# 1996

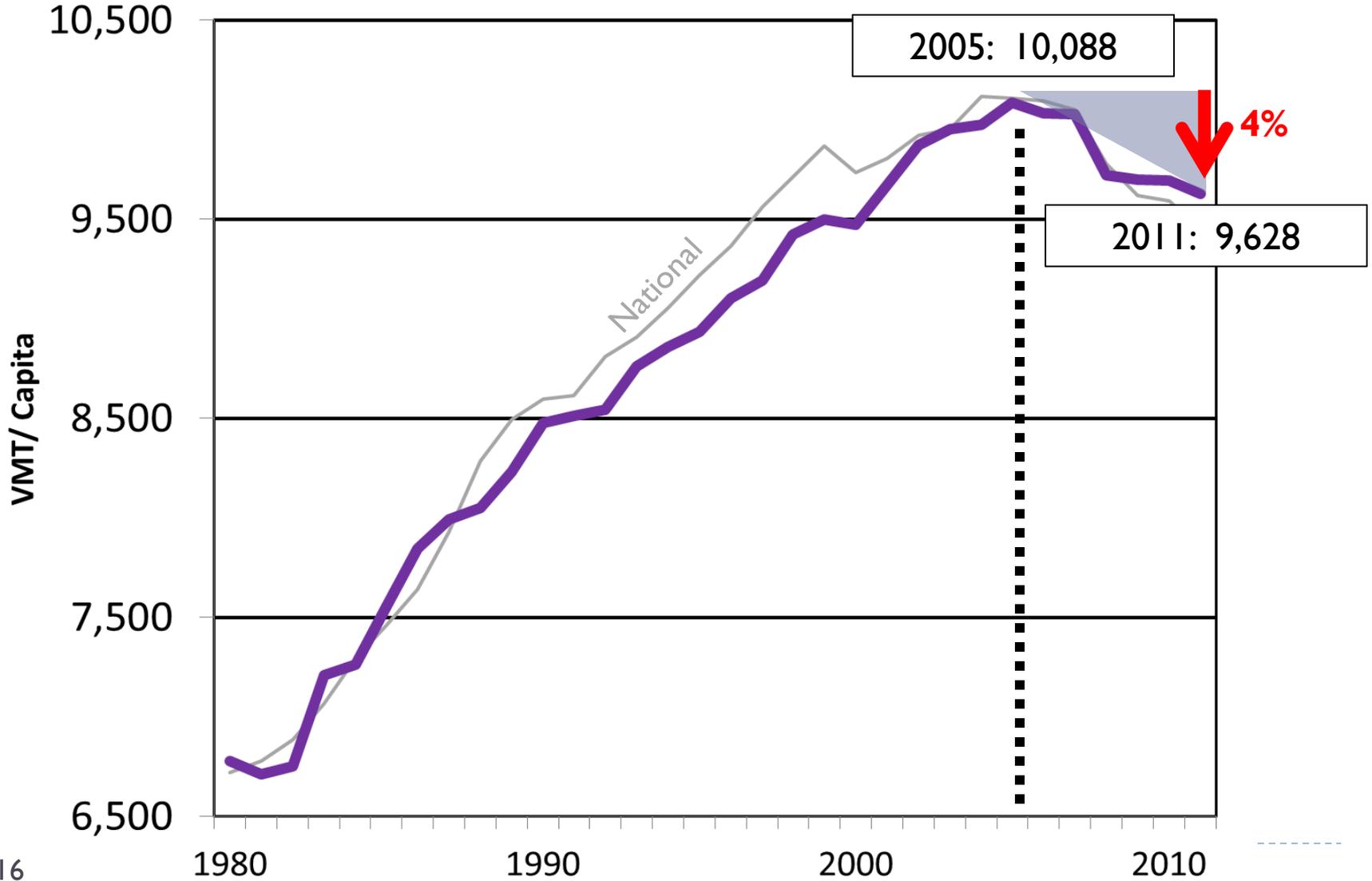
(Tied with Nevada for 2<sup>nd</sup> peak)



# Virginia:

# 1999





# Peak Car Travel: Early & Widespread

Era	States	Total Peaking / Past Peak	Time
Rapid VMT Growth Era		0	23-80 years ago
	Washington State	1	23 years ago
	Washington, D.C. & Nevada	3	19 years ago
Slowing Growth	Virginia + 5 other states	9	16 years ago
Peaking	Maryland + 5 other states	33	10 years ago
Post-Peak	Indiana	49	6 years ago

Longevity of phenomenon suggests  
it may be permanent in nature

# Driving & The Economy

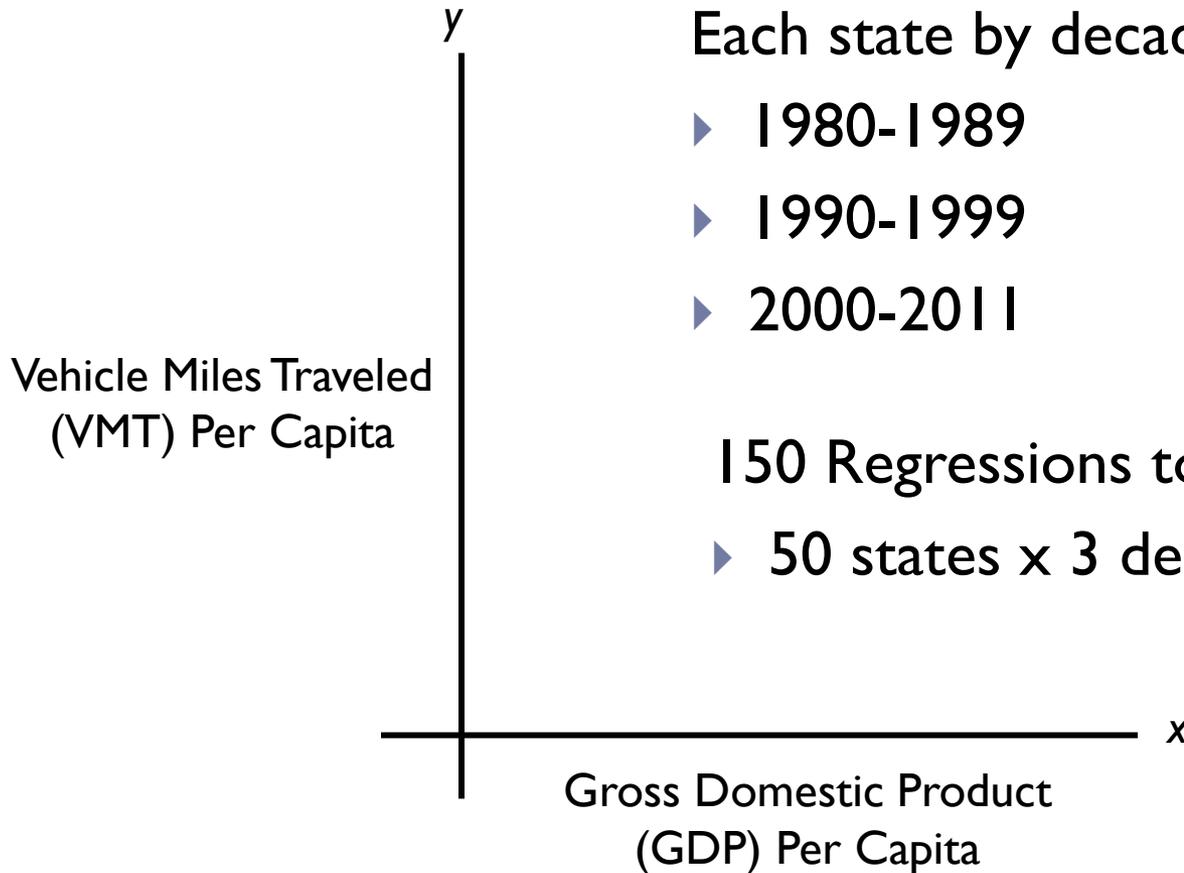
## Simple Linear Regressions:

Each state by decade

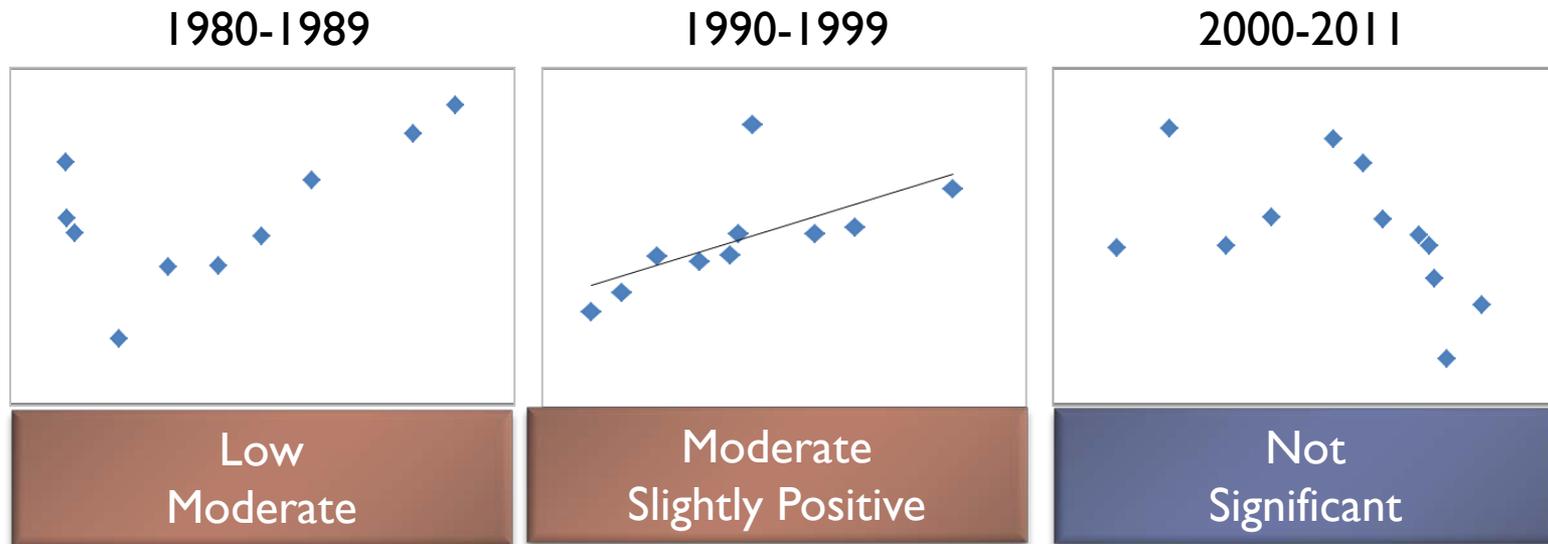
- ▶ 1980-1989
- ▶ 1990-1999
- ▶ 2000-2011

150 Regressions total

- ▶ 50 states x 3 decade per state



# Model Results: Washington, D.C.



P-value: 0.06  
R-Square: 0.36  
Slope: 0.01

0.05  
0.41  
0.03

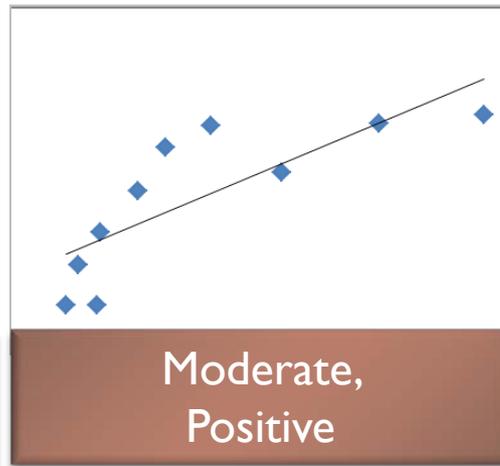
0.11  
N/A  
N/A

# Model Results: Virginia

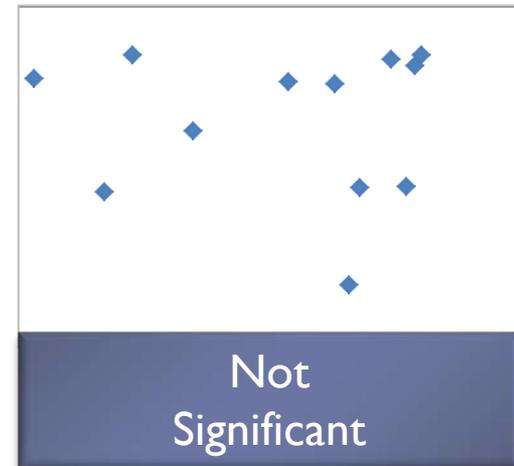
1980-1989



1990-1999



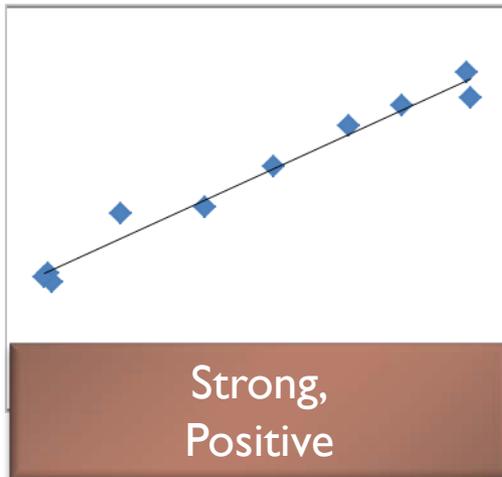
2000-2011



P-value:	0.01	0.01	0.88
R-Square:	0.97	0.63	N/A
Slope:	0.21	0.12	N/A

# Model Results: Maryland

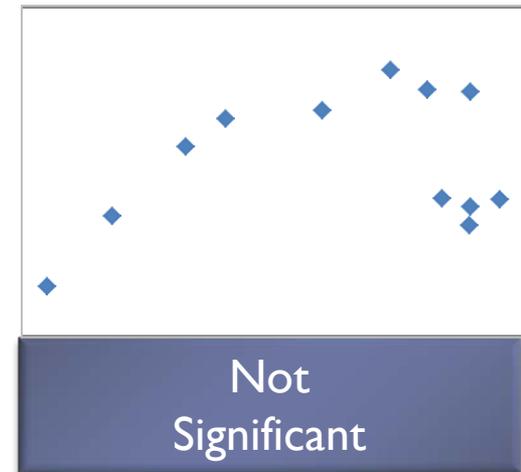
1980-1989



1990-1999



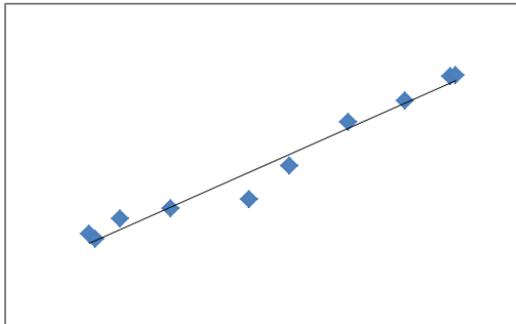
2000-2011



P-value:	0.01	0.01	0.31
R-Square:	0.98	0.83	N/A
Slope:	0.13	0.17	N/A

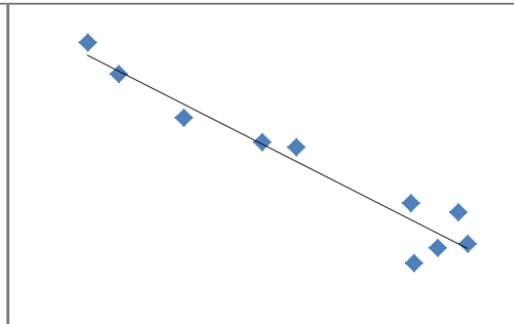
# Driving & The Economy

**40**  
states



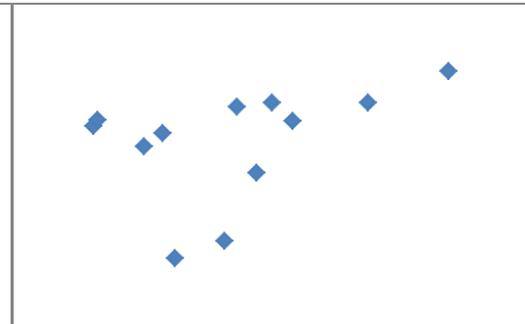
Positively-Correlated

**5**  
states



Negatively-Correlated

**6**  
states

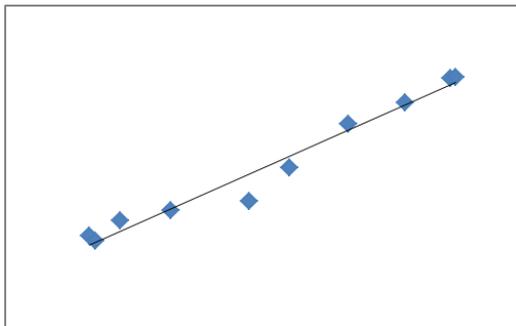


Not Significant

**1980 - 1989**

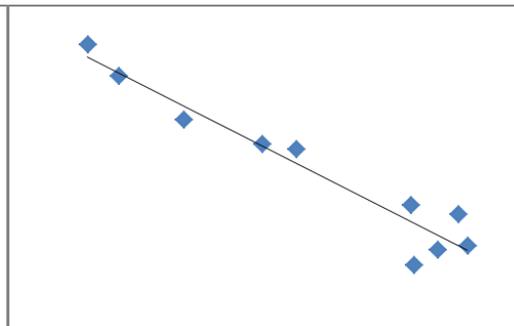
# Driving & The Economy

**47**  
states



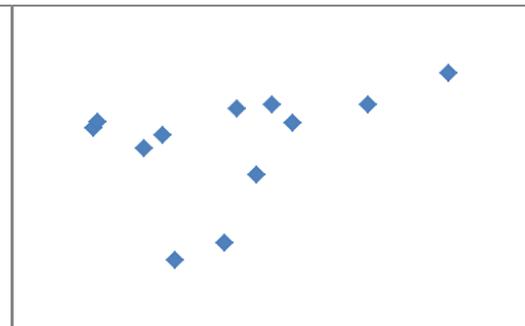
Positively-Correlated

**1**  
state



Negatively-Correlated

**3**  
states

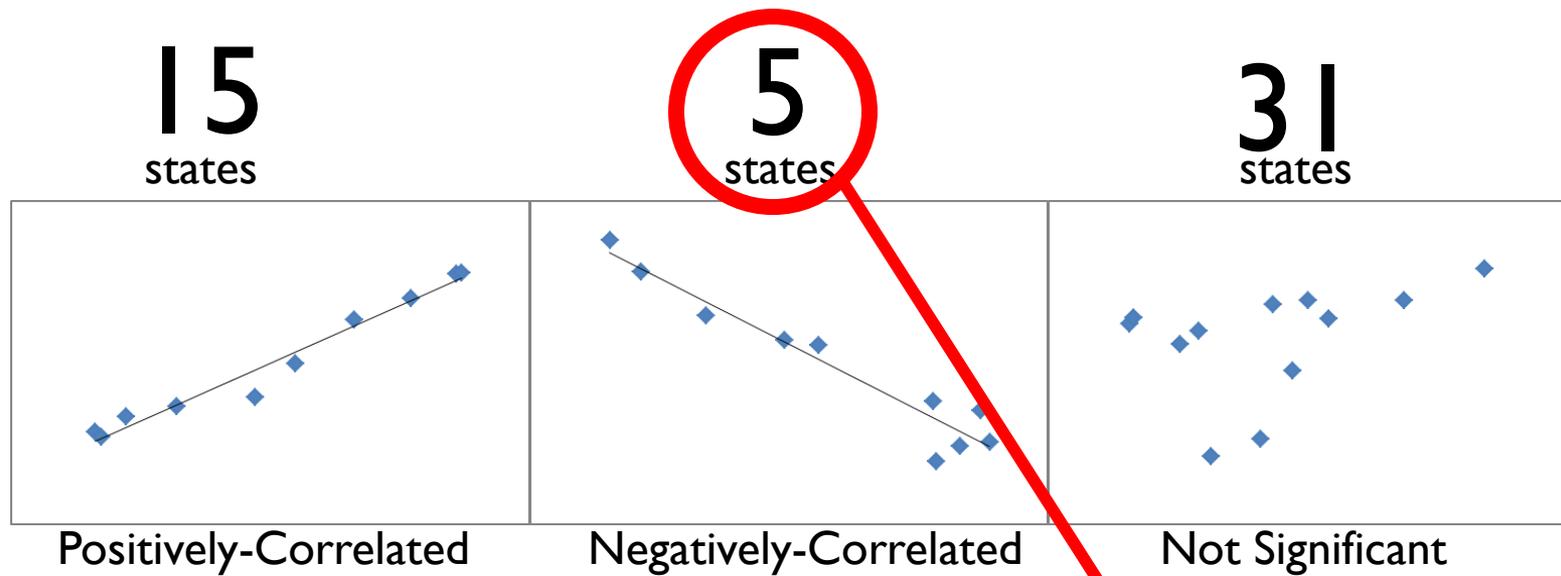


Not Significant

**1990 - 1999**



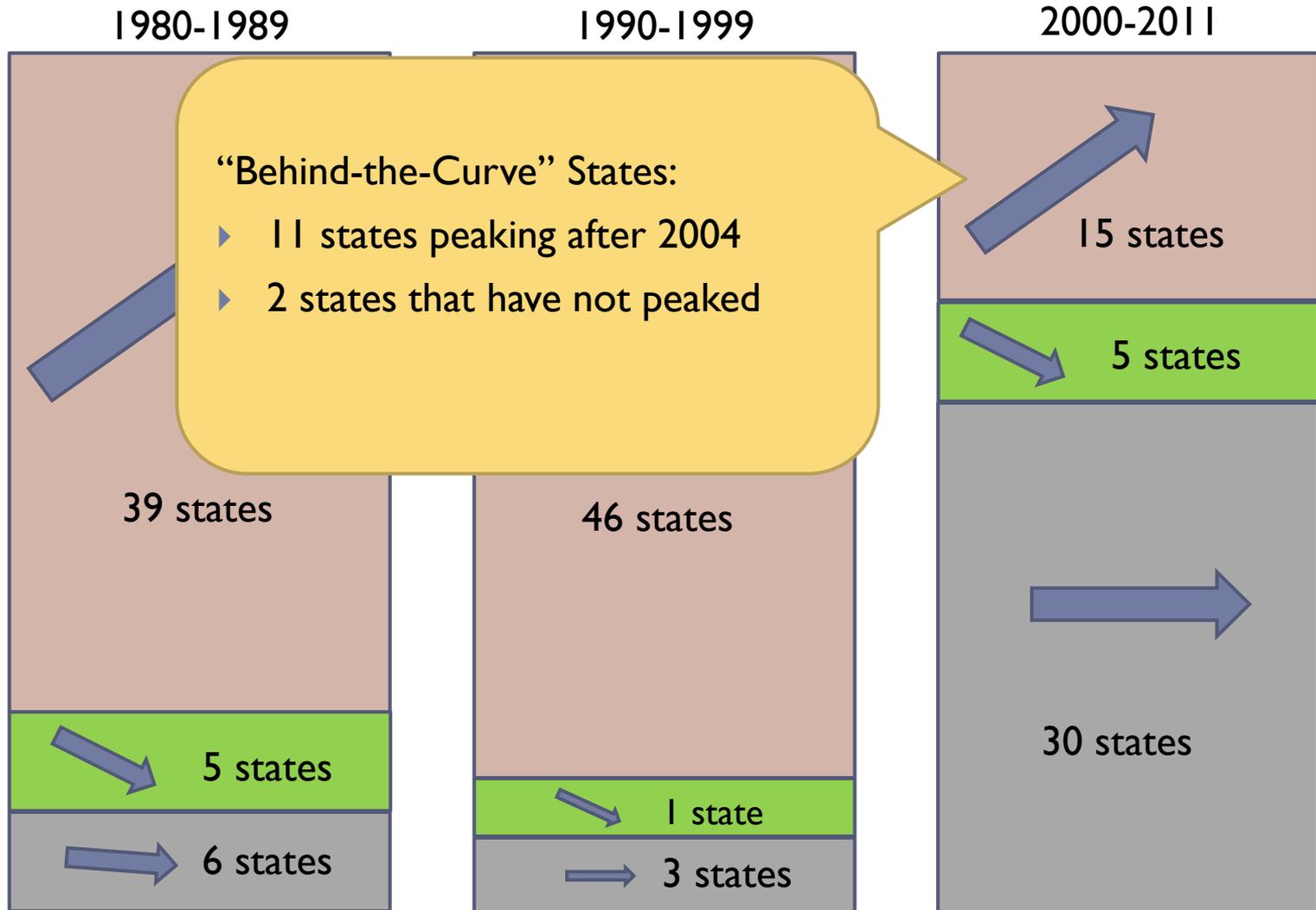
# Driving & The Economy: 2000-2011



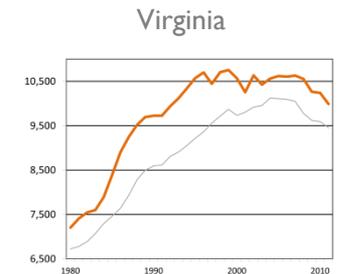
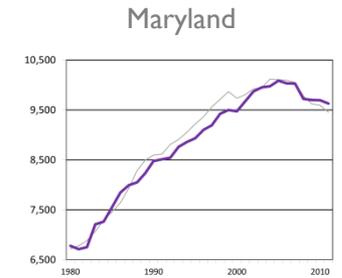
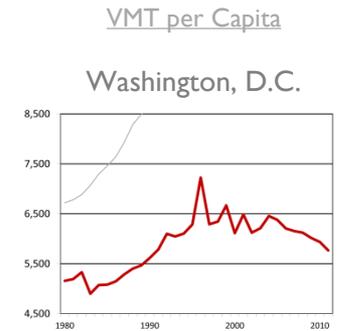
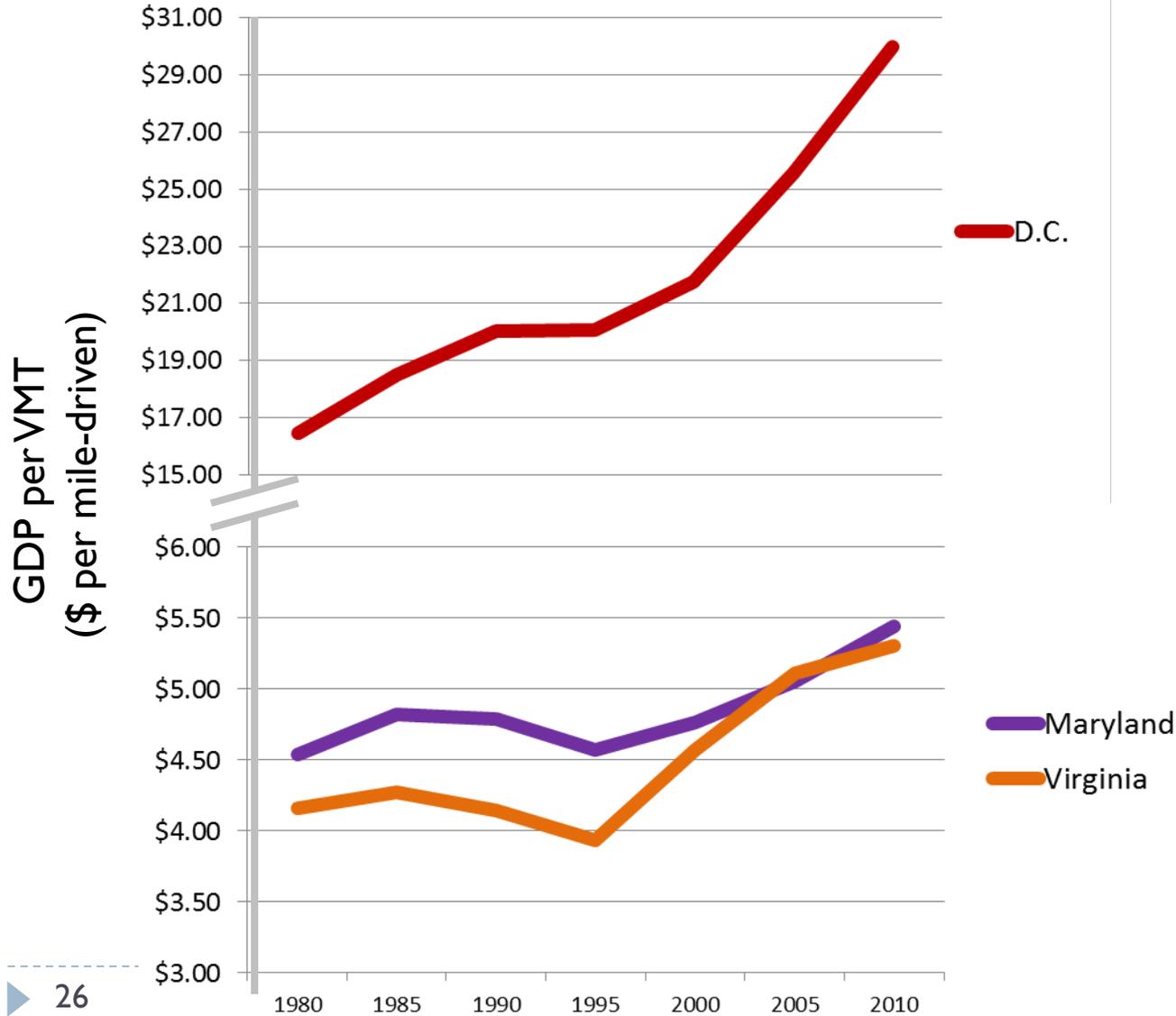
2000 - 2011

Washington (1992 )  
Oregon (1999)  
Kentucky (1999)  
Utah (2002)  
Alaska (2002)

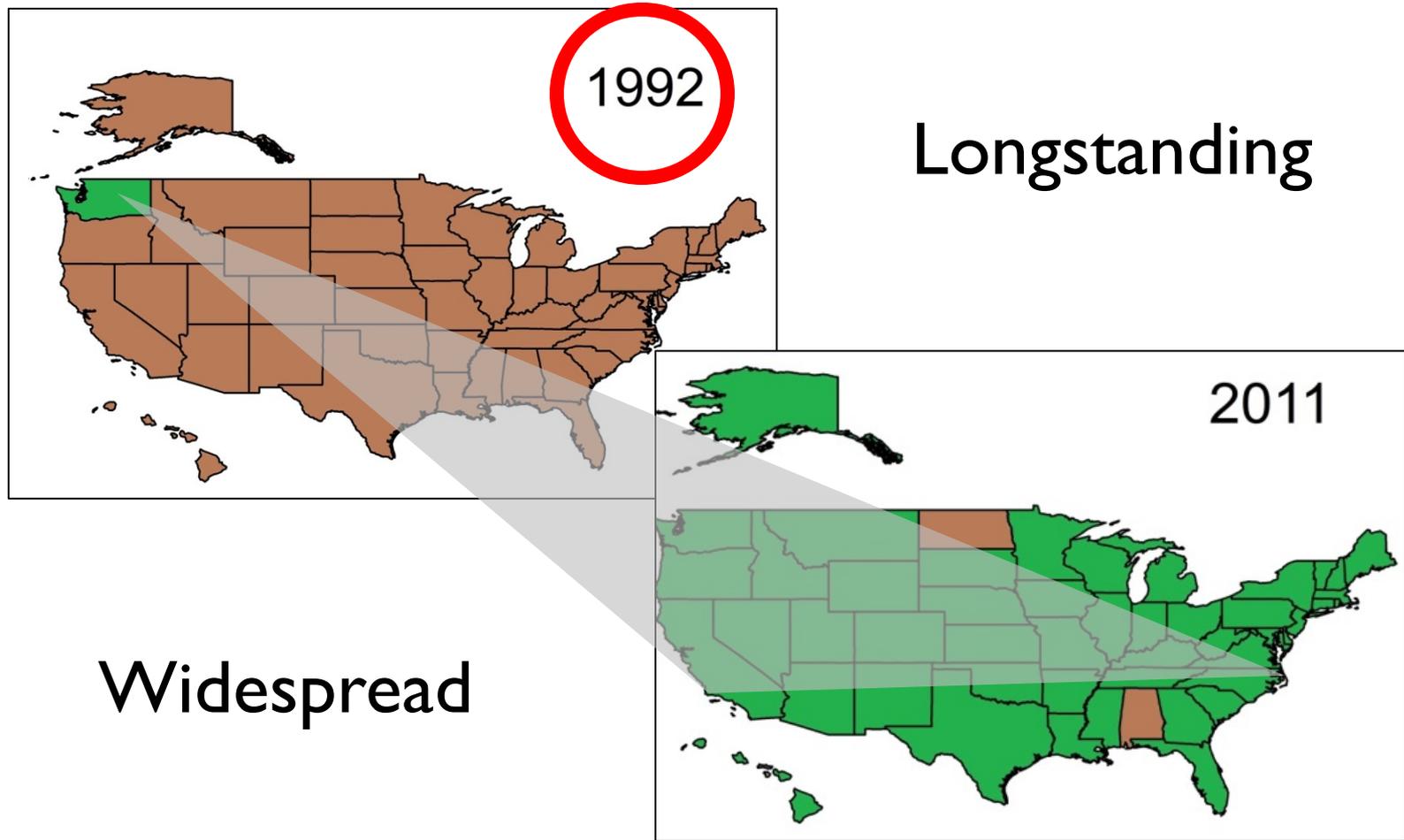
# VMT v. GDP: Three Decades



# Economic-Efficiency-Per-Mile-Driven



# Evidence for a New Era of Travel



# Causes of Peak Remain Unknown

## Peak Travel and the Decoupling of Vehicle Travel from the Economy

A Synthesis of the Literature

Timothy J. Garceau, Carol Atkinson-Palombo, and Norman Garrick

Decades of growth in overall and per capita automobile use led many to believe that driving peaks increase steadily over time. In the mid-2000s, driving levels in the United States and other developed countries peaked and then began to decline. Referred to as "peak travel," this international phenomenon is occurring in places with urban layouts, densities, and demographics that are quite different from one another and suggests a fundamental shift in travel behavior. Strikingly, after 70 years of concurrent growth, the complex relationship between the economy (as measured by gross domestic product) and personal vehicle travel appears to be changing, and this change suggests a weakening connection between the two. This paper reviews the literature about the current understanding and potential causes of these revolutionary trend reversals. Although causes such as saturation of demand, aging, decline of young drivers, preference shifts, and time budget constraints all contribute to reduced automobile travel at one time or another, or in one place or another, none of these factors can explain why peak travel is occurring on multiple scales in a diversity of places. The authors conclude that although the existing literature explains the recent trend reversal in specific cities or partially explains the global phenomenon, the fundamental reasons for peak travel are still not understood. Further, the authors challenge fellow researchers to explain these phenomena for more accurate and efficient planning of the transportation infrastructure.

Automobile travel has dominated the way people choose residences, commute, and live in the United States, creating an automobile-oriented society that demands maintained, free-flowing roadways. Once policy makers chose to rely solely on this travel mode, they became responsible for relieving congestion. Through the cycle of induced travel (1, 2), each highway improvement generated new demand and resulted in additional congestion (3). This predict-and-provide approach used observed driving rates (vehicle miles traveled (VMT) in the United States and vehicle kilometers traveled (VKT) in other countries) as its mobility measure, with increased driving levels assumed to represent mobility success. Despite predictions that saturation of vehicle ownership would serve to stabilize driving rates in the early 1990s (4), driving levels continued to grow until 2004, when per capita driving rates reached a plateau and then began

to decline (Figure 1) (9, 10). This new trend, labeled "peak travel" (11) or "peak car" (12, 13), is so different from that of prior decades of growth in vehicle travel that it is considered a new era of travel (14). Whether peak travel is permanent or temporary is unclear and leaves some to suggest that economic improvement could foster a return to increased driving levels (15–17). For example, 2013 trends in traffic volume showed that driving levels were increasing when compared with those of 2 prior years; however, those levels were still well below the 2004 peak (18).

Initially, the economic recession of 2008 and recessions were identified as reasons for reduced driving. Investigation found that peak travel began before any economic events (11, 15, 19). A second divergence from what some are calling a "decoupling" is the apparent assumed connection between personal vehicle travel growth (as measured by gross domestic product (GDP) for decades in the United States, VMT and GDP grew in a correlated manner that suggested intricate connectivity) mid-1990s, GDP began growing faster than VMT, weakening its driving's contribution to economic growth. The nature of the relationship into question (20, 22) economy recovers and driving rates stagnate or decline assumption of connectivity between driving and the no longer be justified.

The reasons for peak travel are a determination of this paper first discusses the use of observed driving rates in transportation planning and then the potential relationship between the economy while their similar historic growth at reversals are considered. It then summarizes the factors of vehicle travel before reviewing the literature causes of the peak travel phenomenon.

### SIGNIFICANCE OF PERSONAL VEHICLE TRAVEL

Driving distance per person, as measured by VMT in the United States (VKT per capita elsewhere), is an indicator of driving behavior and system performance to measure, readily available, and easily transferred geographically (20, 24). These data have limitations, however, they neither provide indications of available capacity or vehicle fuel efficiencies nor account for nonauto (9, 20). Despite many limitations, data on vehicle travel have been used as critical metrics for transportation funding. For decades, transportation planners had questions about future travel behavior and associated costs

T. J. Garceau and C. Atkinson-Palombo, Department of Geography, 215 Glenbrook Road, Unit 4140, and N. Garrick, Department of Civil and Environmental Engineering, 261 Glenbrook Road, Unit 2027, University of Connecticut, Storrs, CT 06269. Corresponding author: T. J. Garceau, timothy.garceau@uconn.edu.

Transportation Research Board, *Journal of the Transportation Research Board*, No. 2412, Transportation Research Board of the National Academies, Washington, DC, 2014, pp. 41–46. DOI: 10.3141/2412-05

41

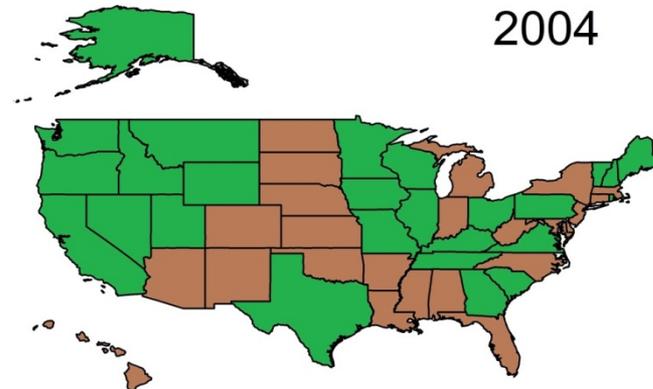


Transportation and the New Generation  
Why Young People Are Driving Less and What It Means for Transportation Policy

FRONTIER GROUP U.S. PIRC  
TRANSPORTATION BOARD

# Causes of Peak Remain Unknown

- 1992: WA State peaked
- 1996: D.C. & Nevada peaked
- 1999: 6 states peaked
- 2000: 2 states peaked



Predates

Expansion of Information Communication Technologies (ICT)

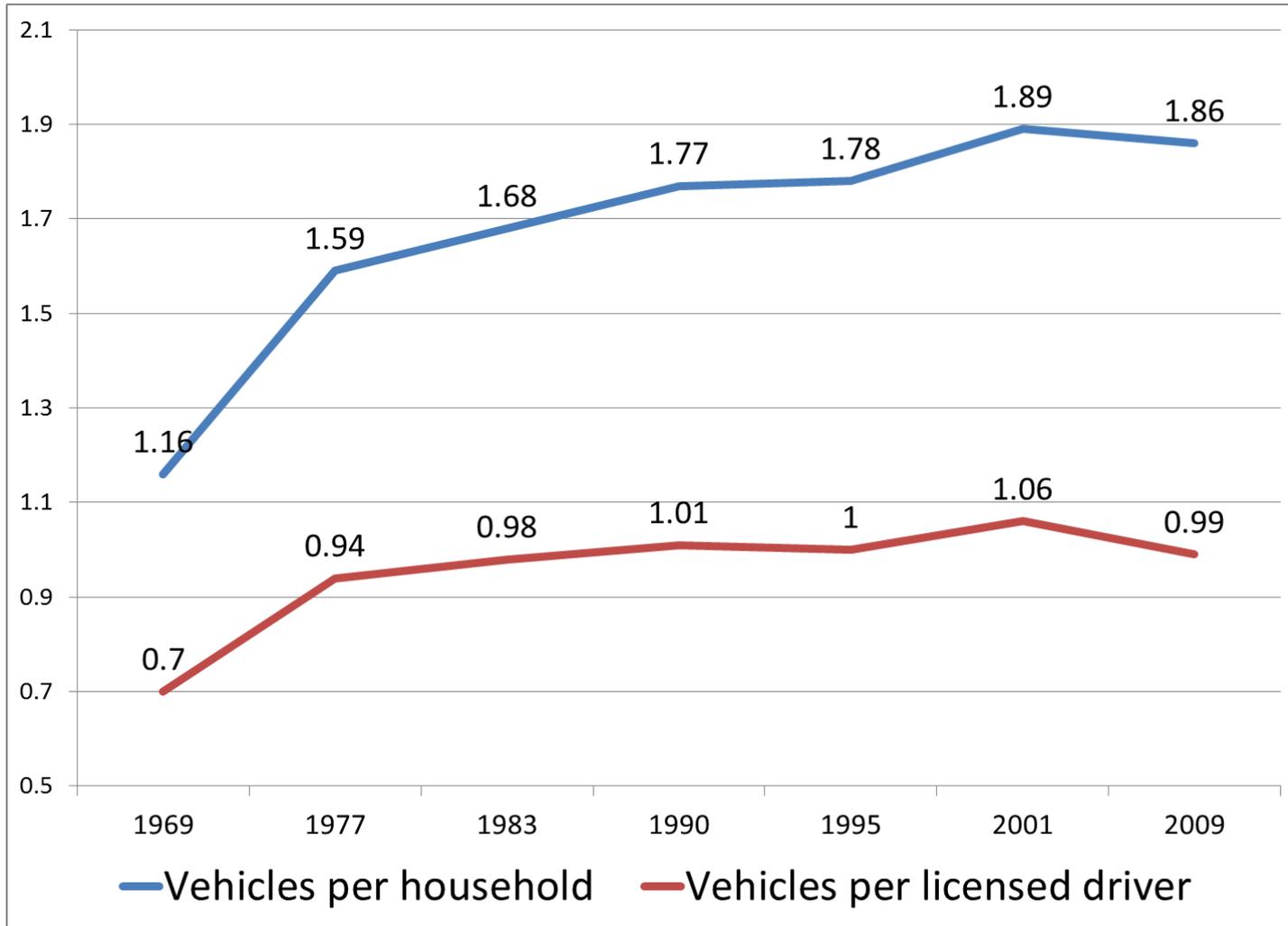
The Great Recession of 2008

# Exploring Potential Causes

## Back-to-City Movement:

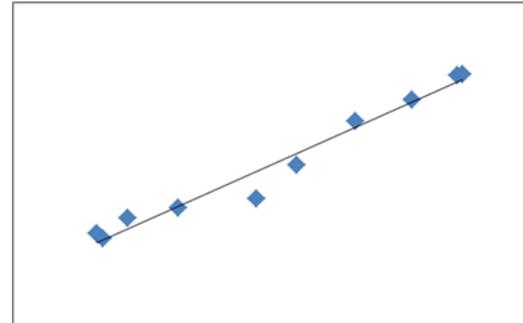
- Young & Old
- Reversal of flight to suburbs?
  - Residential
  - Employment centers
- Transit-Oriented & Mixed Use Development

# Changing Car Ownership

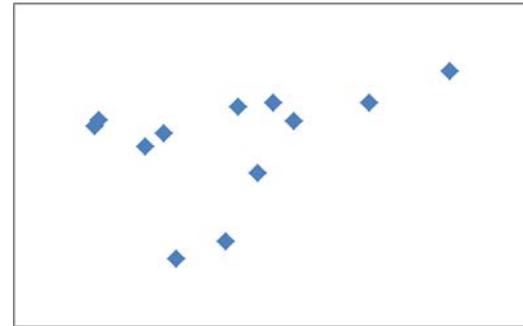


# Increased Wealth No Longer Equates to Increased Driving

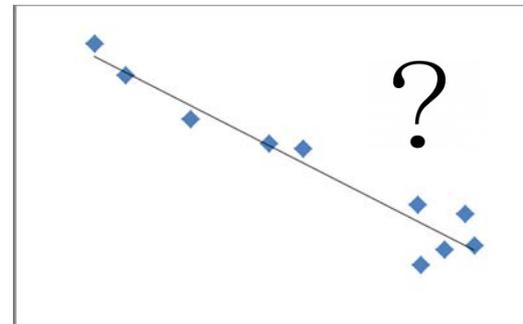
Positive relationship strengthened from 1980's to 1990's



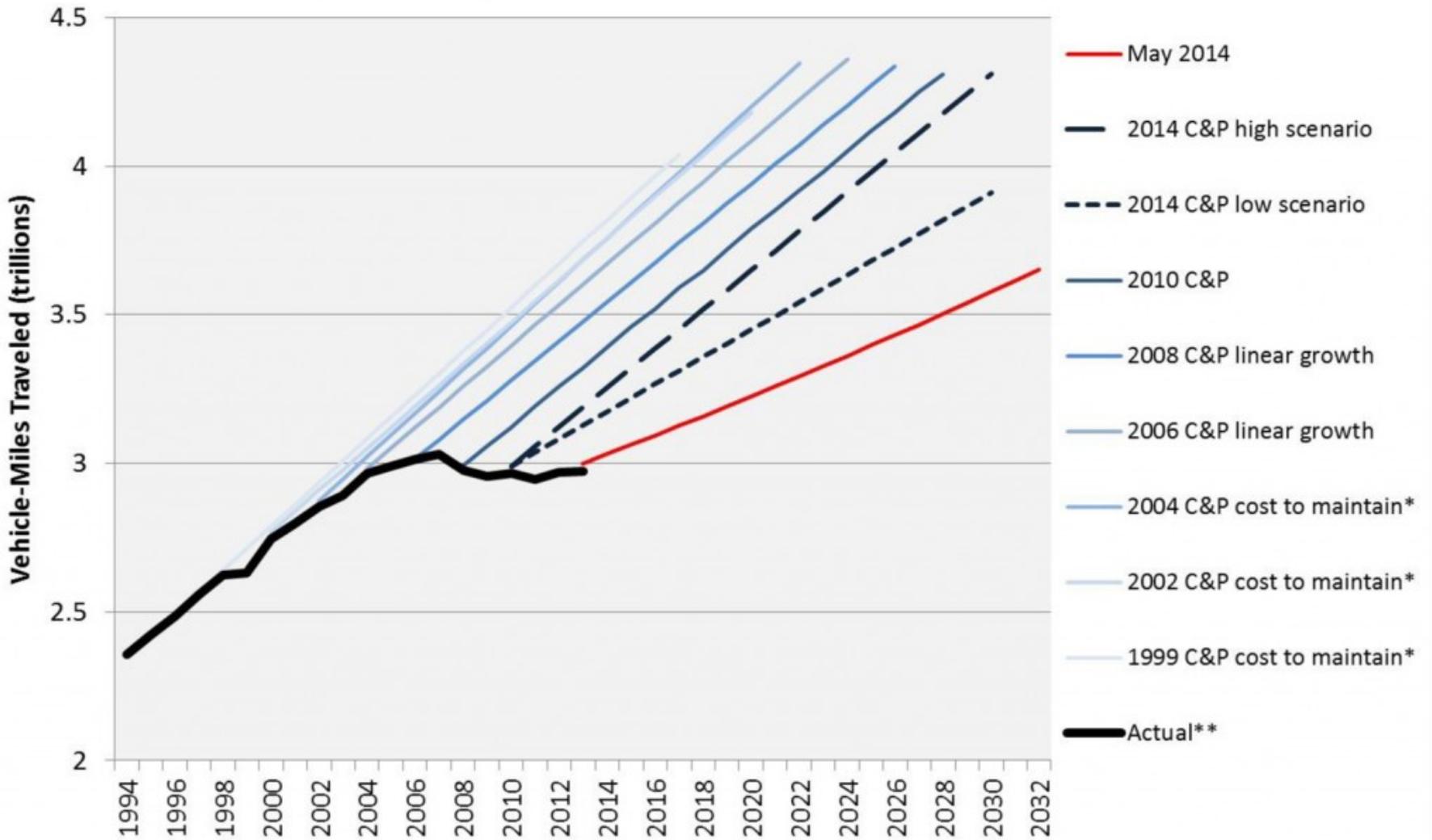
Relationship severed in New Era of Travel



Relationship may be reversing



# U.S. Dept of Transportation Forecasts of Future Driving vs. Reality



C&P scenarios depicted based on linear growth; FHWA May 2014 forecast on compound growth.

\* Based on "Cost to Maintain" scenario.

\*\* Data through 2012 from FHWA Highway Statistics; 2013 data from FHWA Traffic Volume Trends

FHWA: Federal Highway Administration; C&P: Conditions & Performance report.

Frontier Group



# Planning for a New Era

## 2012 ITE President's Message:

“So will VMT continue its slight downward trend, or will it turn upwards and rejoin the economic activity trends?

All of these factors will need to be weighed to make proper recommendations for future decisions.”

VMT decrease will most likely continue

We see positive economic growth in the face of decreasing VMT

States need to reconsider transportation planning approaches to focus on increasing access rather than congestion reduction

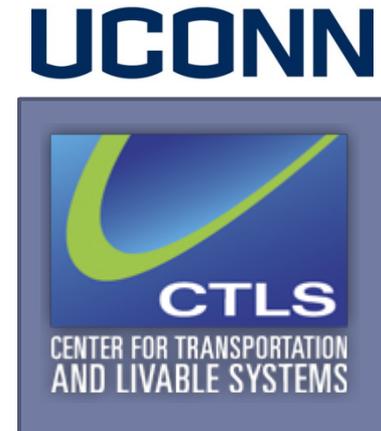
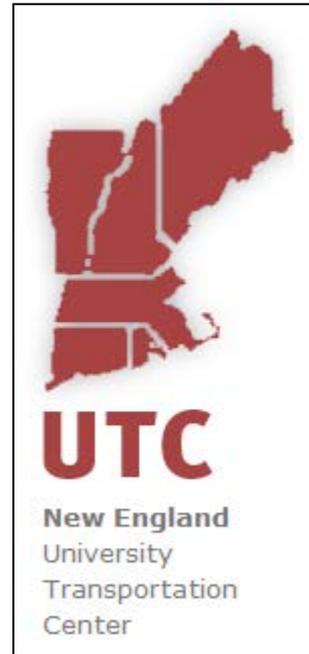
Can D.C. and the MWCOC be a leader and model for other agencies?

# Acknowledgements



**FHWA**

*Dwight David Eisenhower  
Transportation Fellowship*



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Ryan Westrom

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[ryan.westrom@dc.gov](mailto:ryan.westrom@dc.gov)

# Sources

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