



The State of California's Infrastructure: the Challenges of Rebuilding America

Sue McNeil

Department of Civil and Environmental Engineering

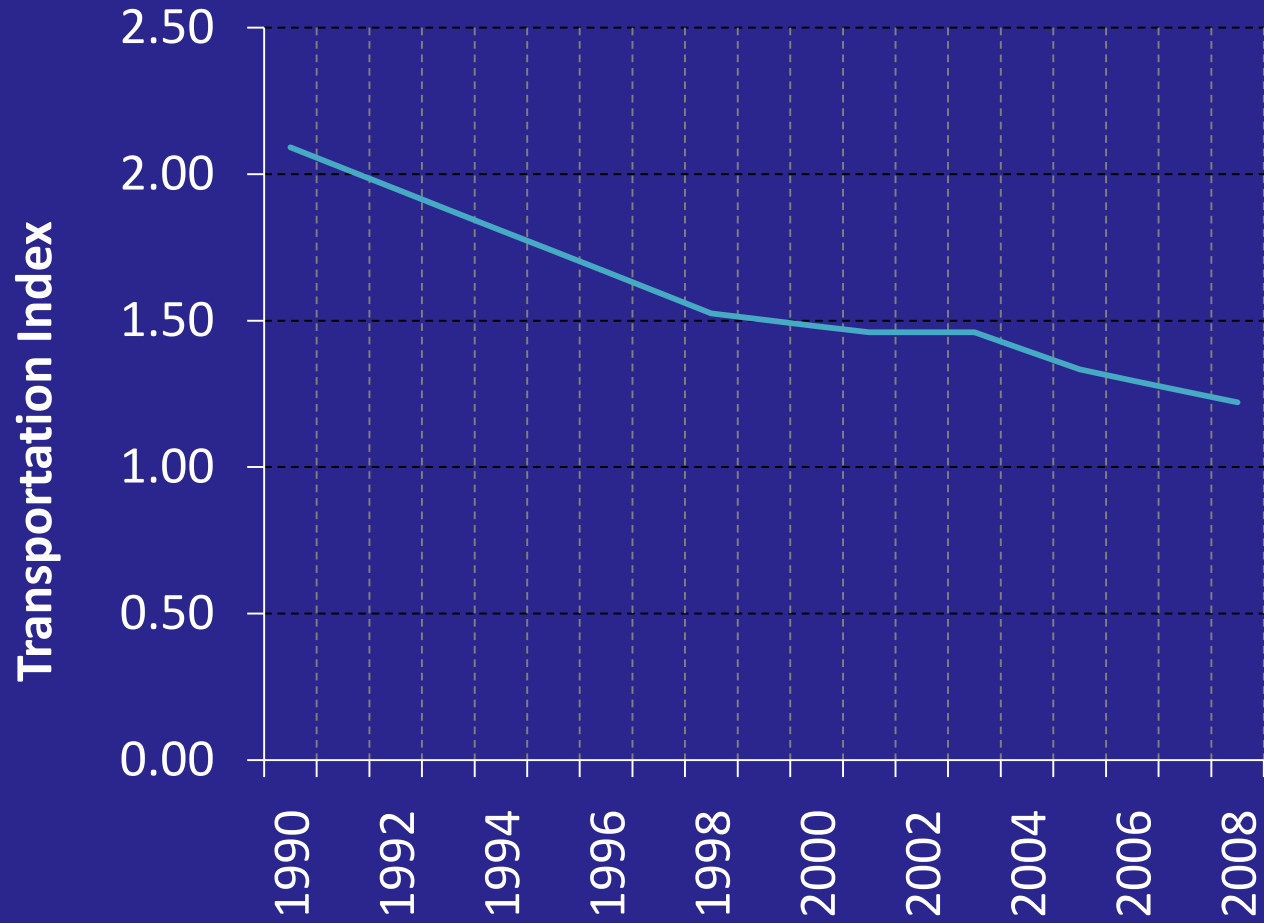
smcneil@udel.edu

- AVIATION: D
- BRIDGES: C
- DAMS: D
- DRINKING WATER: D-
- ENERGY: D+
- HAZARDOUS WASTE: D
- INLAND WATERWAYS: D-
- PUBLIC PARKS AND RECREATION: C-
- RAIL: C-
- ROADS: D-
- SCHOOLS: D
- SOLID WASTE: C+
- TRANSIT: D
- WASTEWATER: D-
- America's Infrastructure G.P.A.: D

A = Exceptional
B = Good
C = Fair
D = Poor
F = Inadequate



ASCE's Report Card



ASCE CALIFORNIA INFRASTRUCTURE REPORT CARD 2006

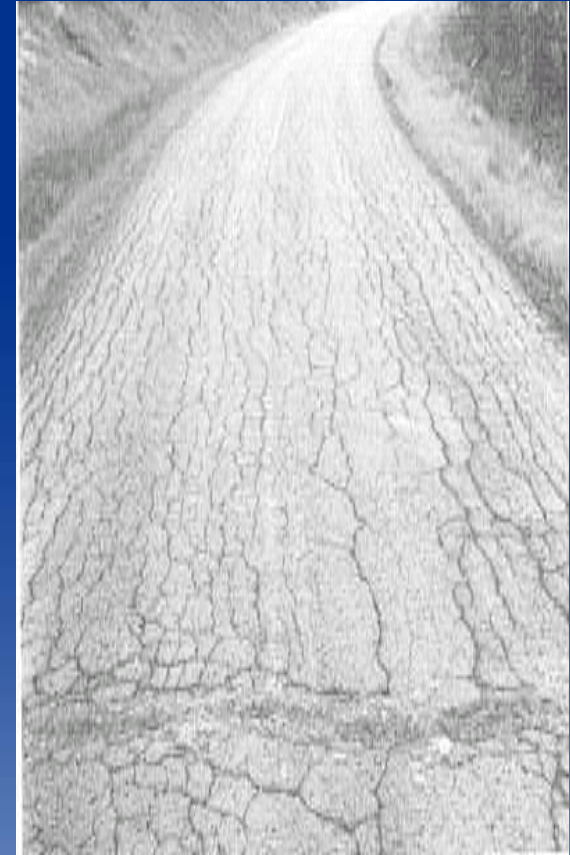
www.ascecareportcard.org

Aviation	C ⁻
Levees / Flood Control	F
Parks / Open Space	D ⁺
Ports	C ⁺
Solid Waste	B
Transportation	D ⁺
Urban Runoff	D ⁺
Wastewater	C ⁺
Water	C ⁺
California's Infrastructure GPA	C⁻

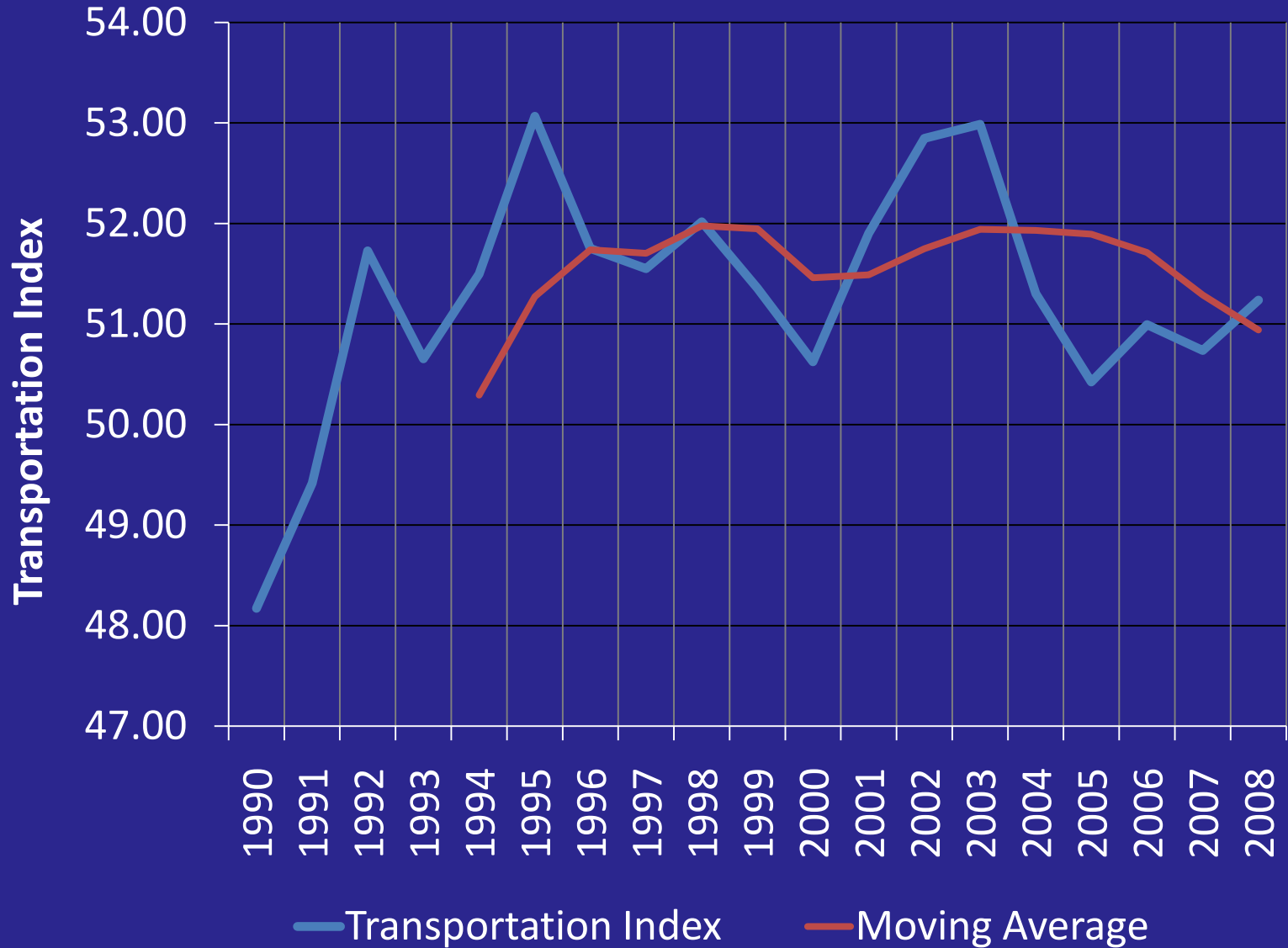
Annual Investment Needs

\$37 Billion

- CNBC Special Report *America's Top States for Doing Business (2010)*
 - Transportation and Infrastructure, California Ranked 16.
- Enterprising States (Praxis Strategy Group and Kotkin, 2010)
 - Only in air and port investment, California ranked in the top 25. (Other categories were bridge condition and road condition)
- "Hold the Wheel Steady: America's Roughest Rides and Strategies to Make our Roads Smoother" (September 2010)
 - Based on a ranking of share of roads in poor condition and vehicle operating costs, eight of the top-twenty (worst) urban regions (500,000+ population) are in California.

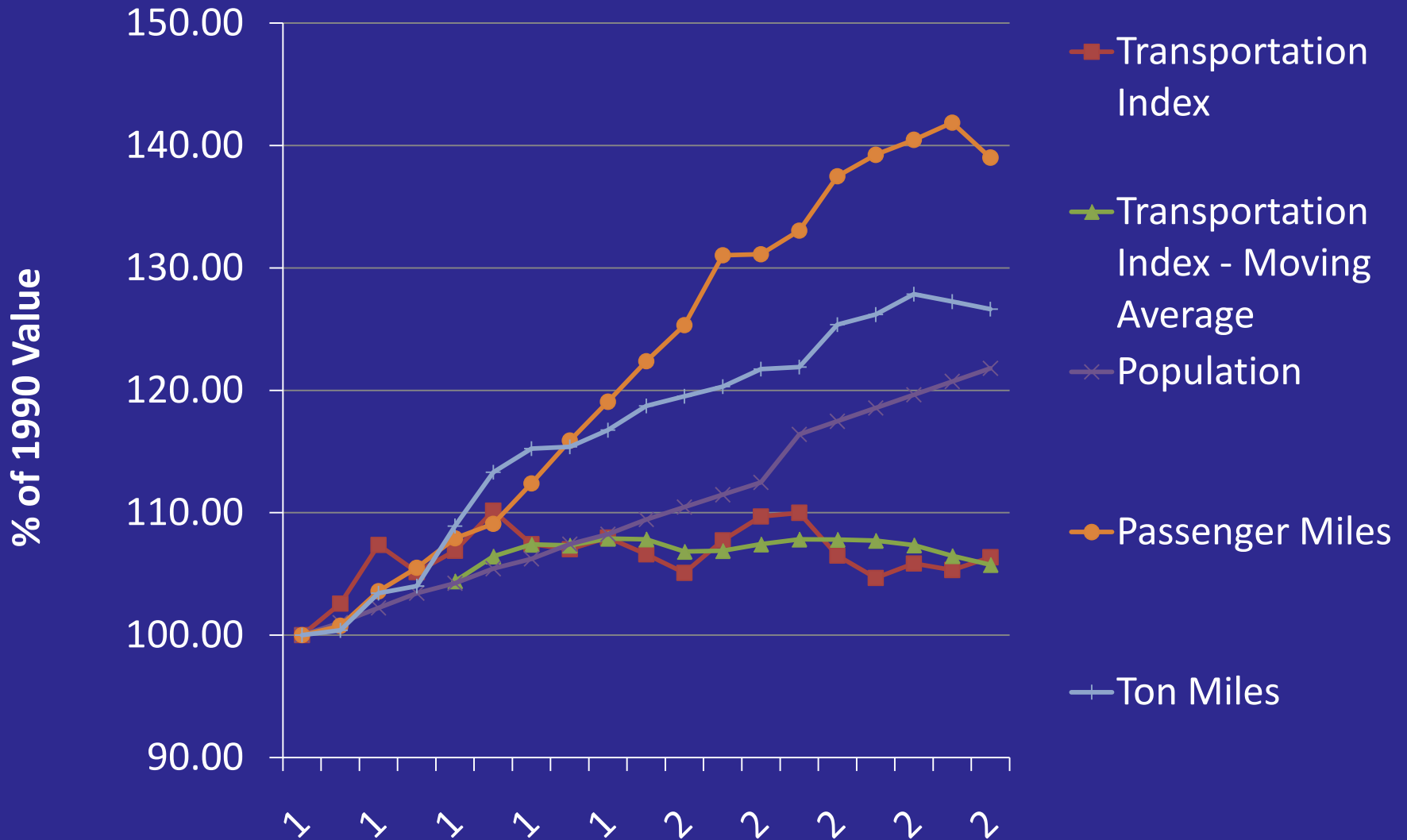


Transportation Performance Index (TPI)

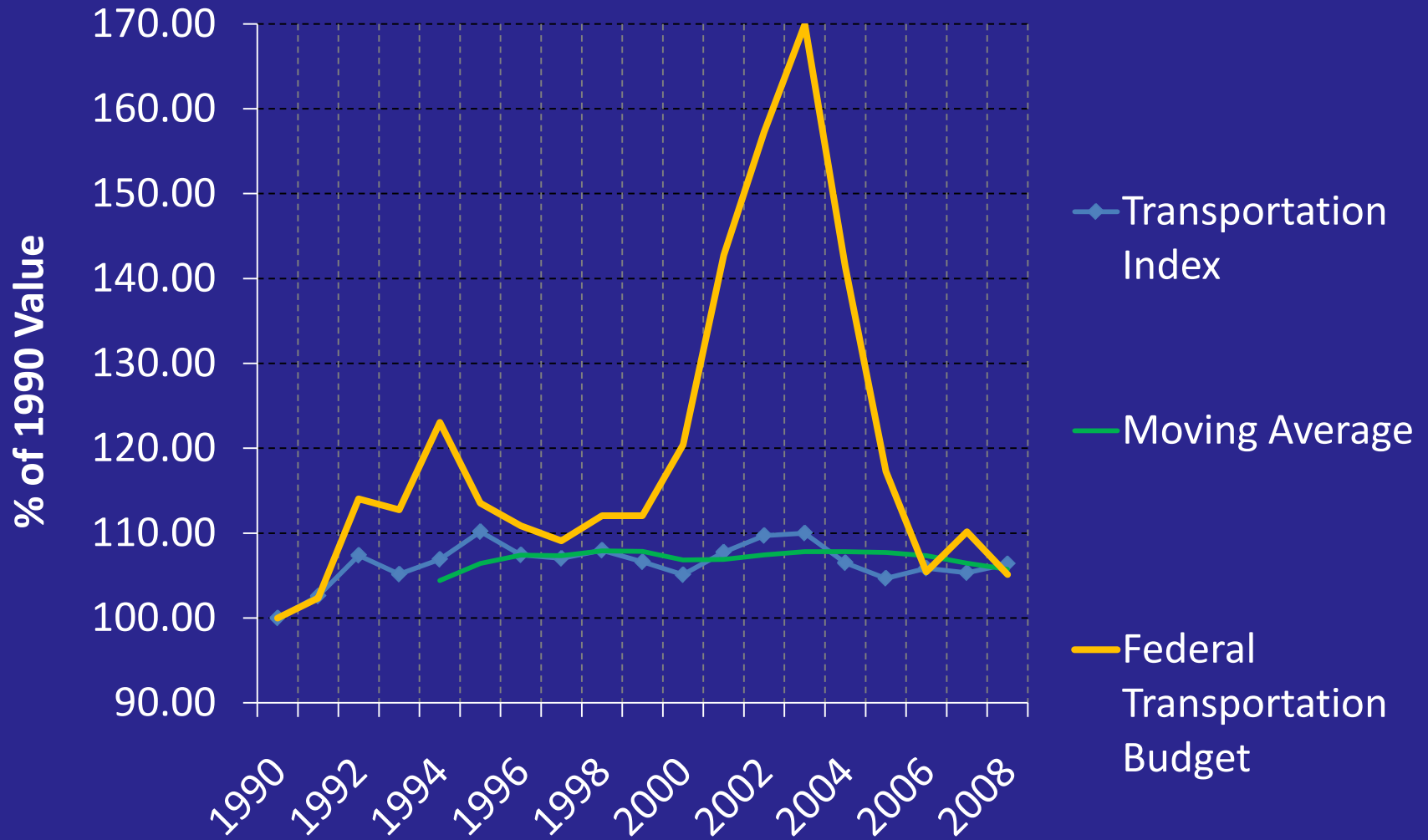


- 1. Definitions**
- 2. Geographic Samples**
- 3. Hierarchical Model**
- 4. Identify Indicators**
- 5. Explore Data Sources & Assemble Data**
- 6. Weight the Indicators**
- 7. Compute the Index**

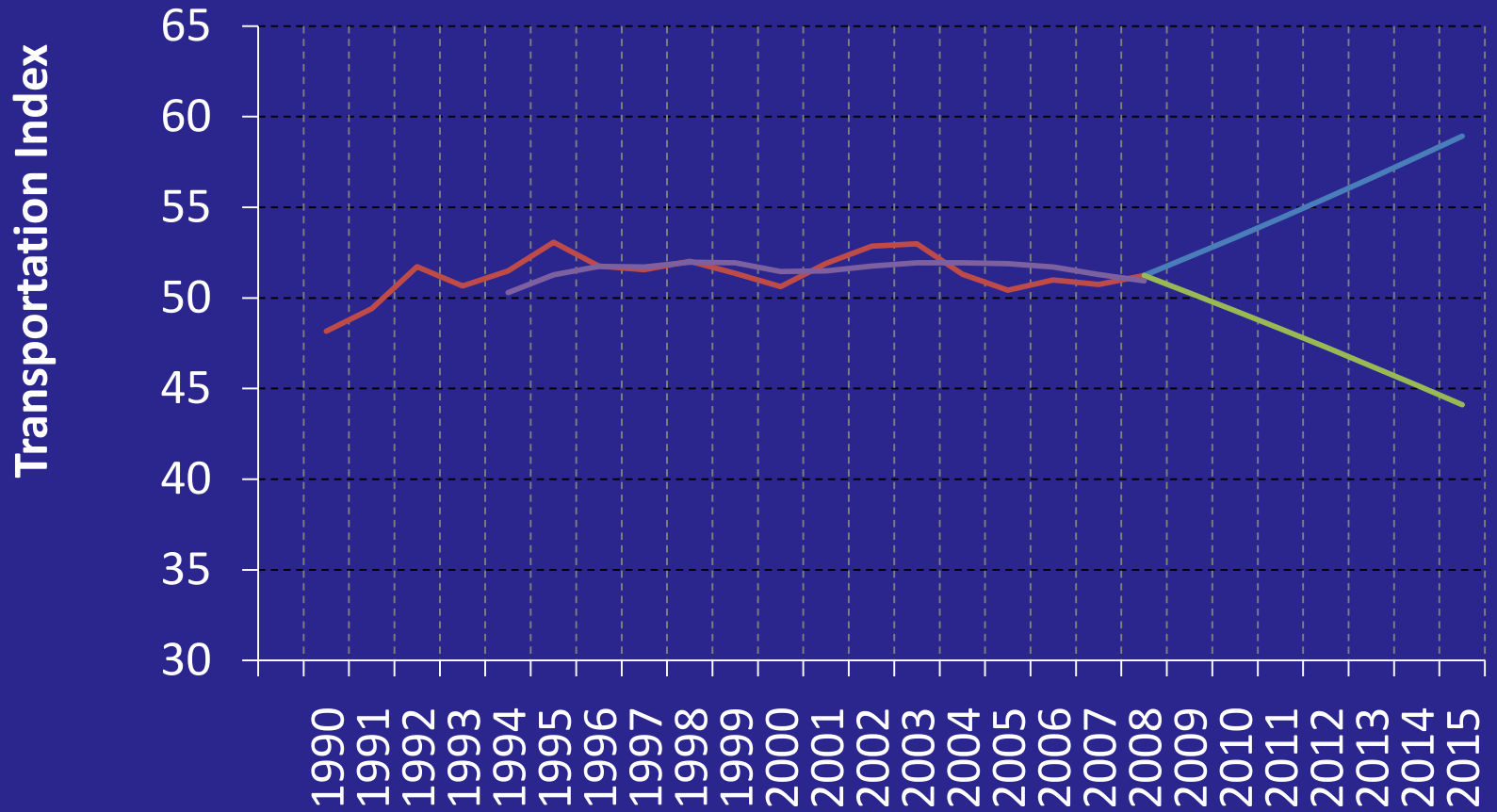
Comparison with Other Time Series



Federal Transportation Expenditures



Extrapolated Future - 2015



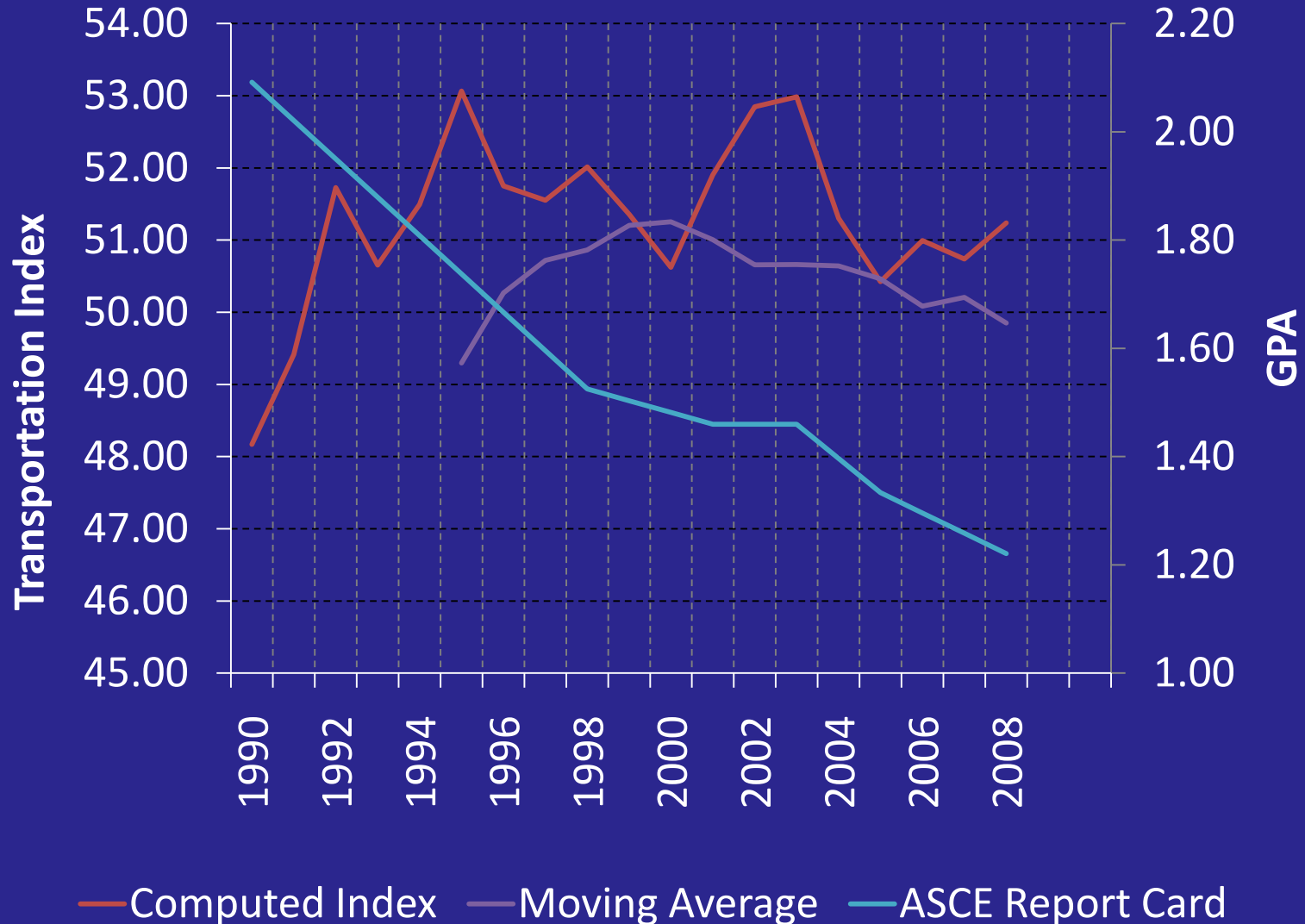
— Computed Index

— New Investment

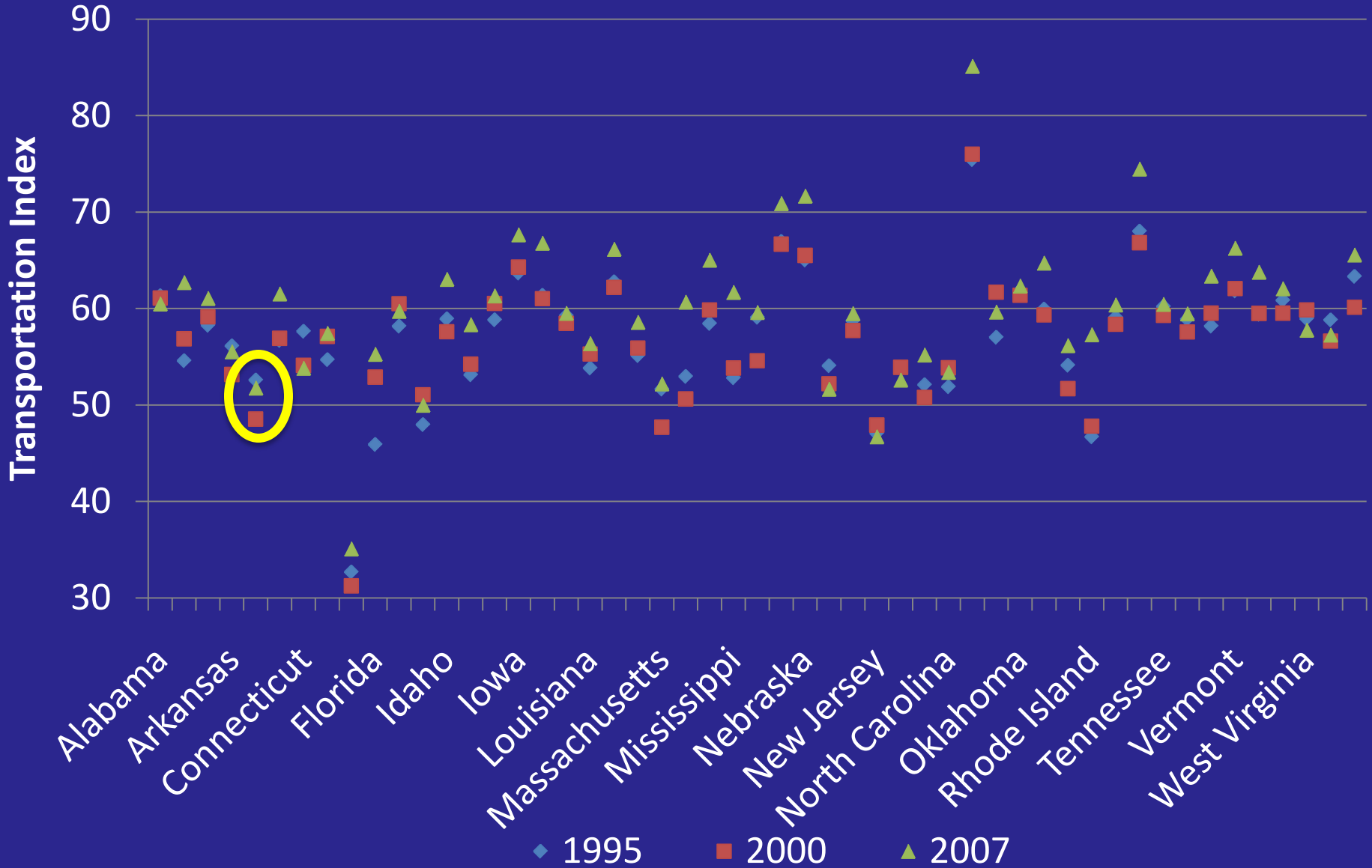
— No new investment

— Moving Average

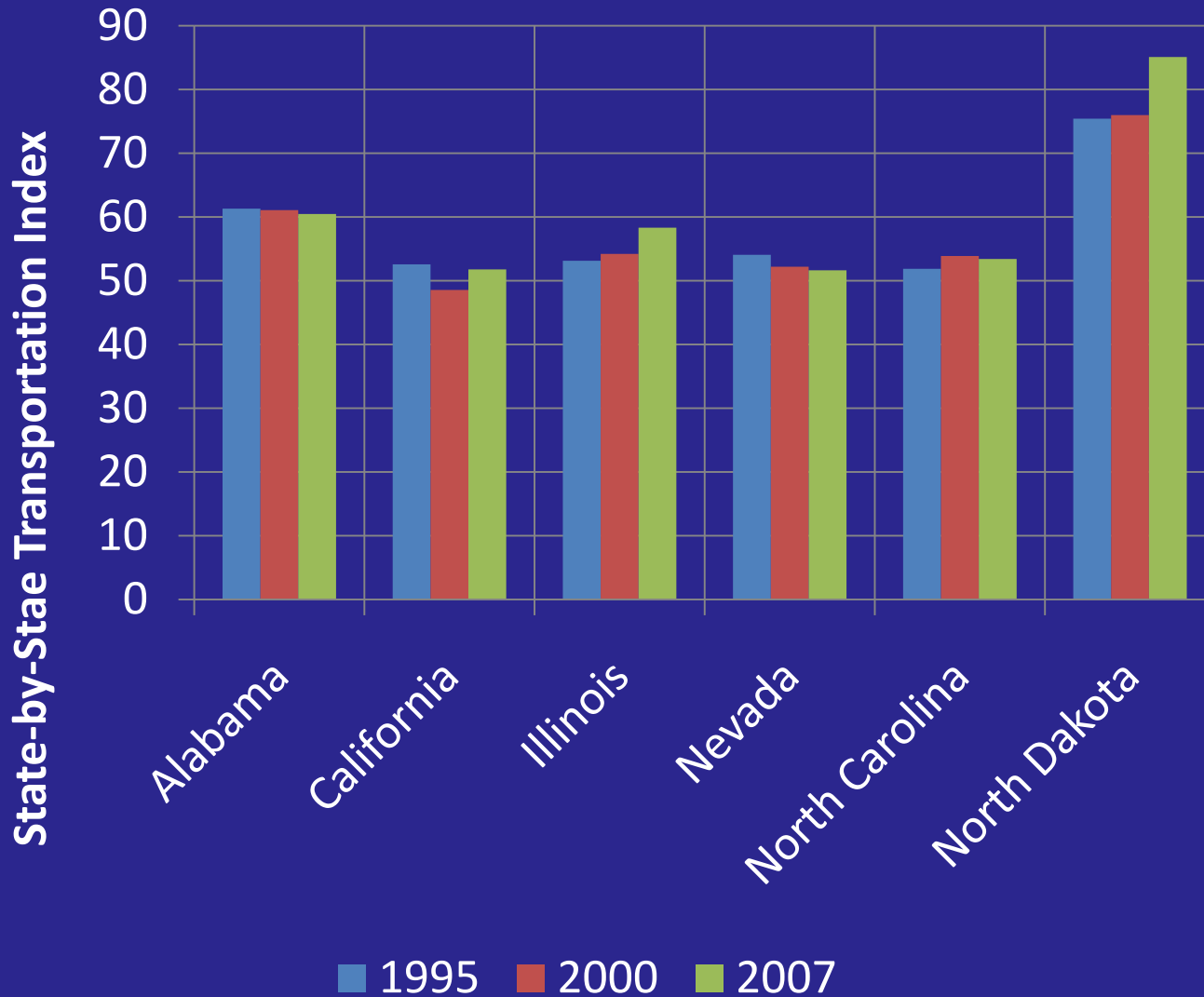
ASCE's Report Card



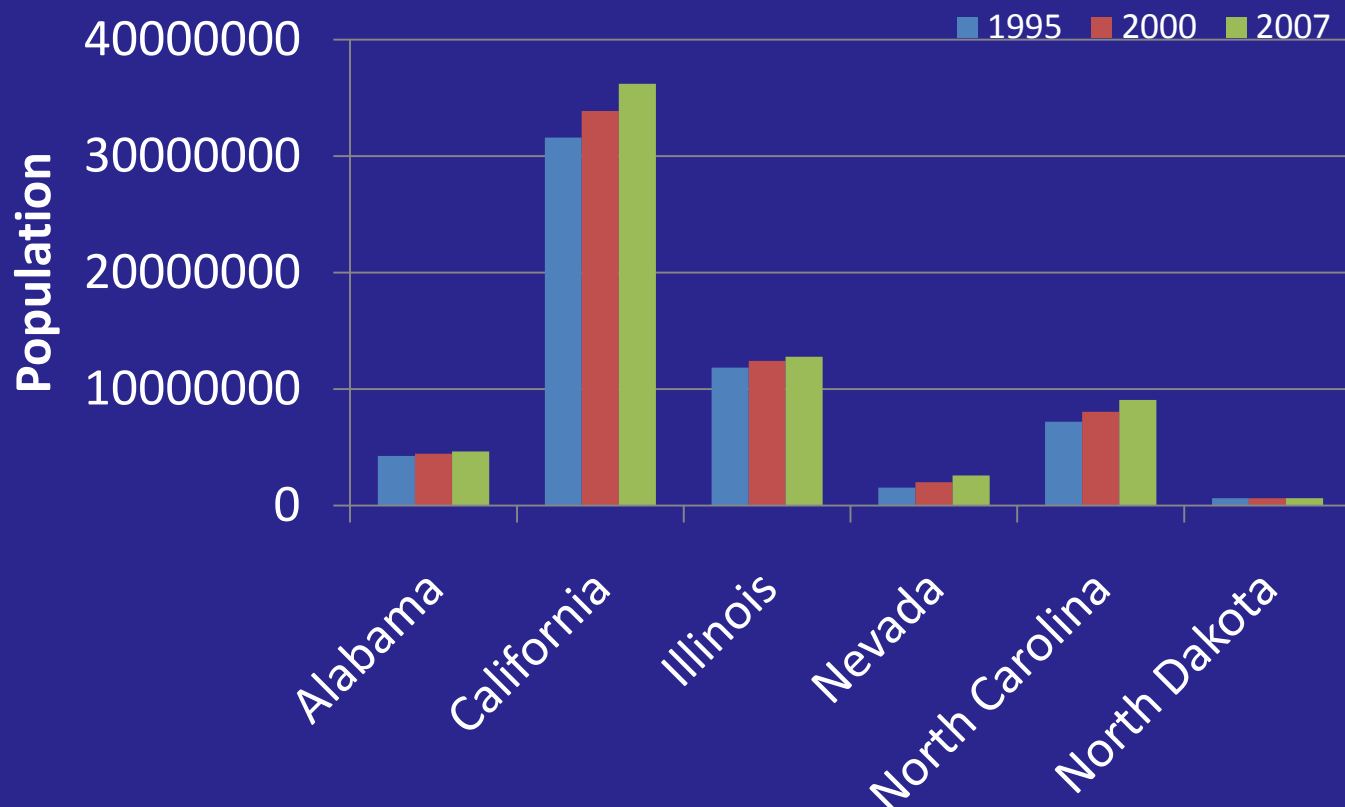
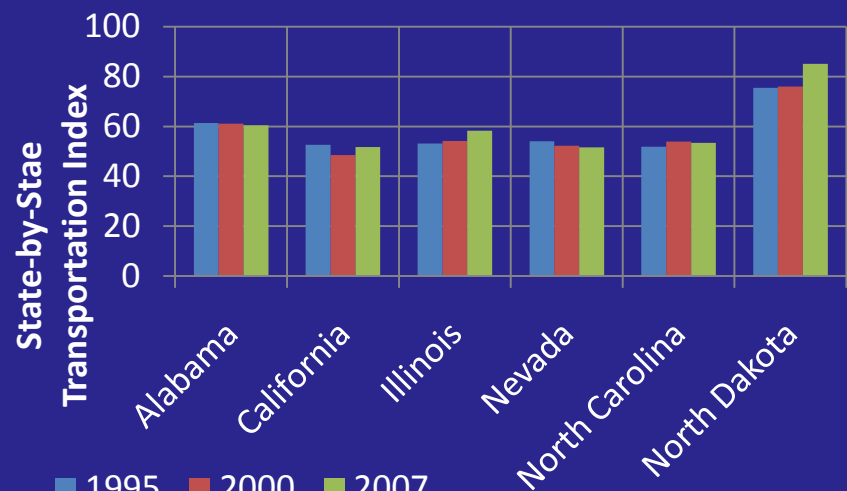
State by State Results



Select State Comparison – Transportation Performance Index

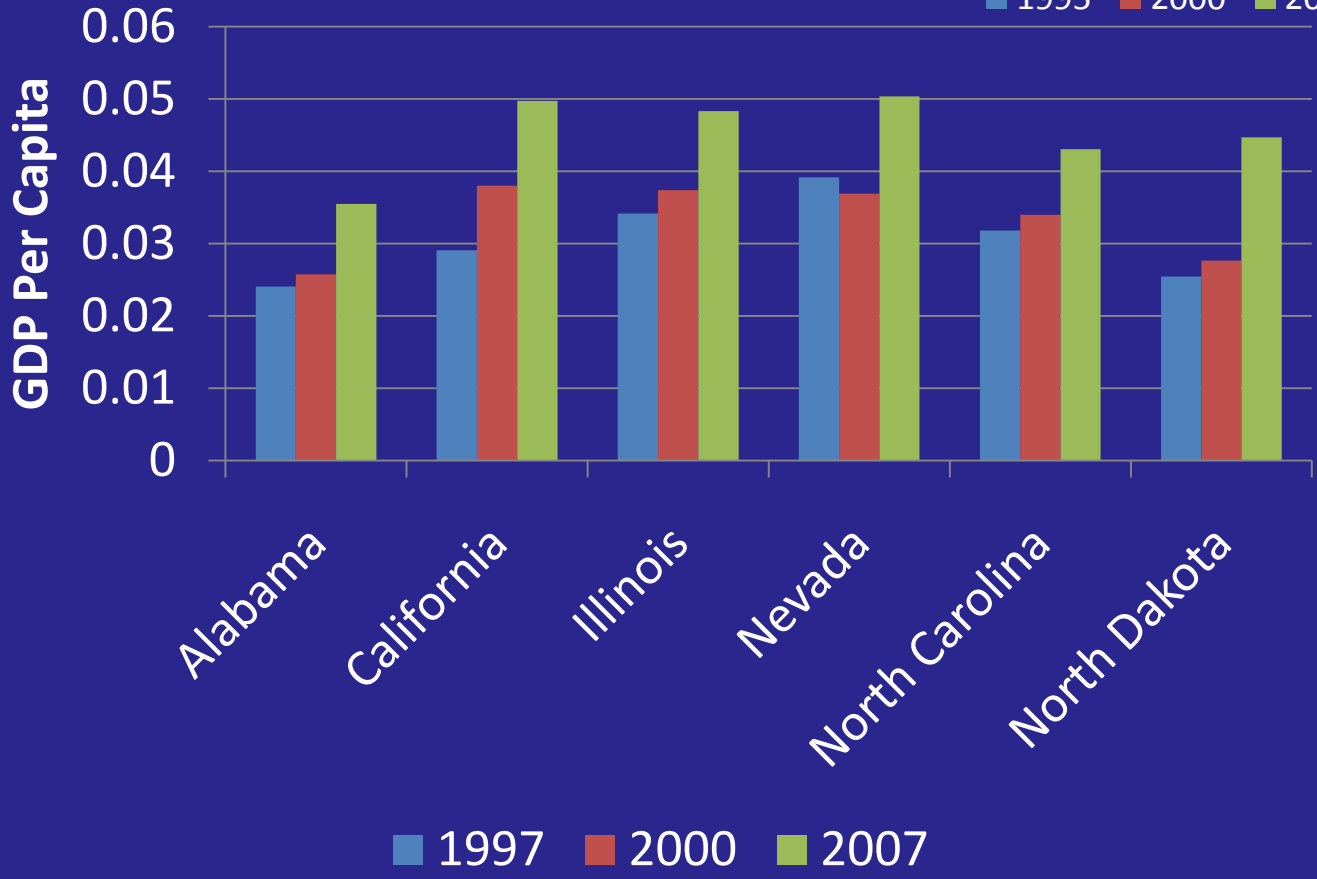
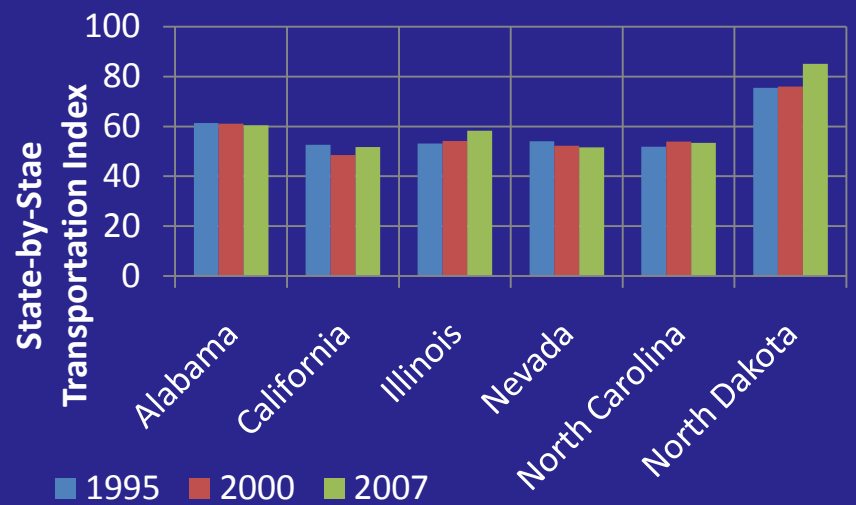


Select State Comparison – Population

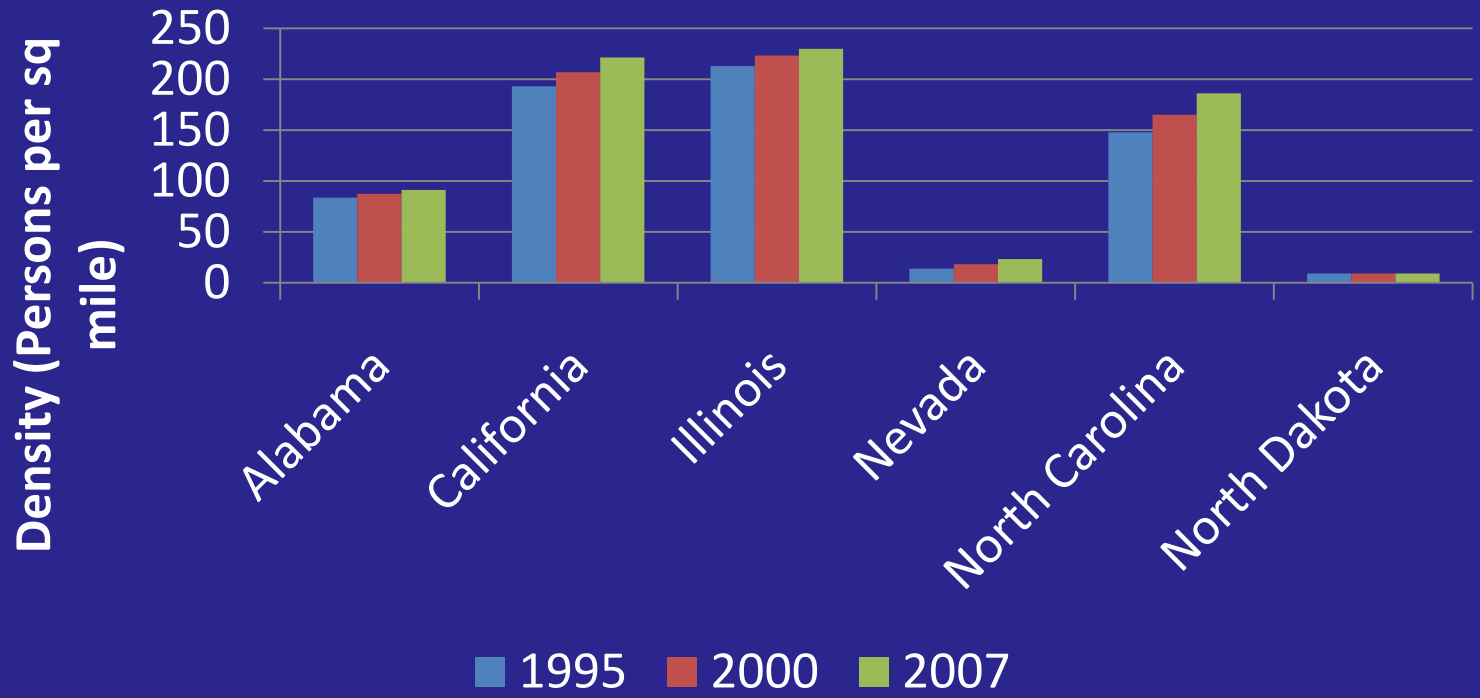
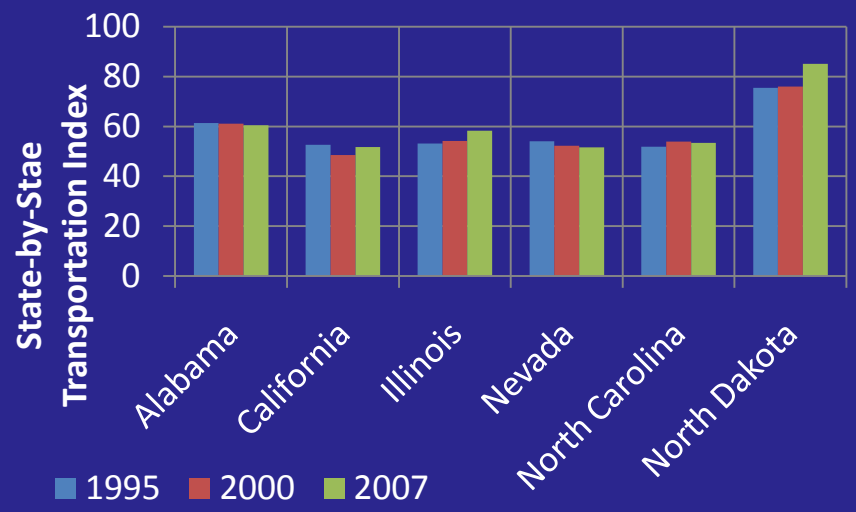


■ 1995 Population ■ 2000 Population ■ 2007 Population

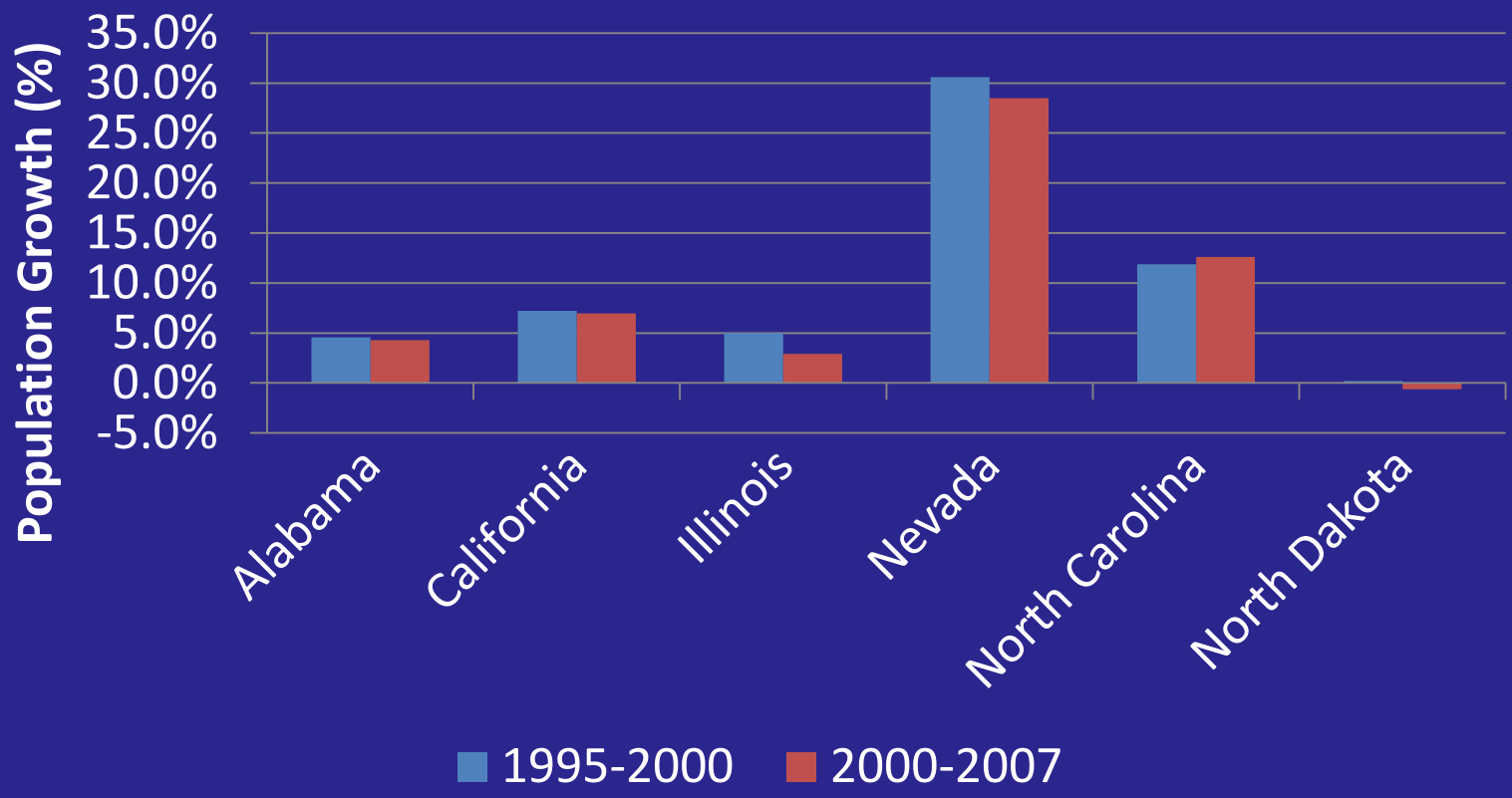
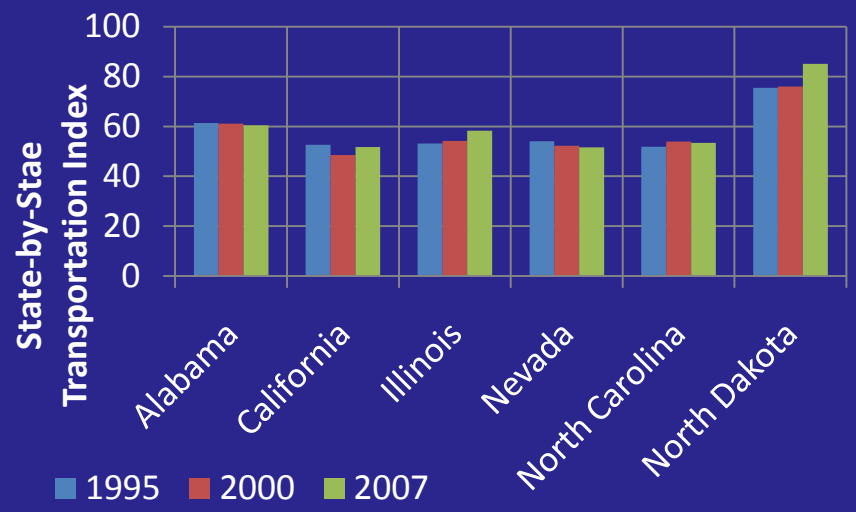
Select State Comparison – GDP per Capita

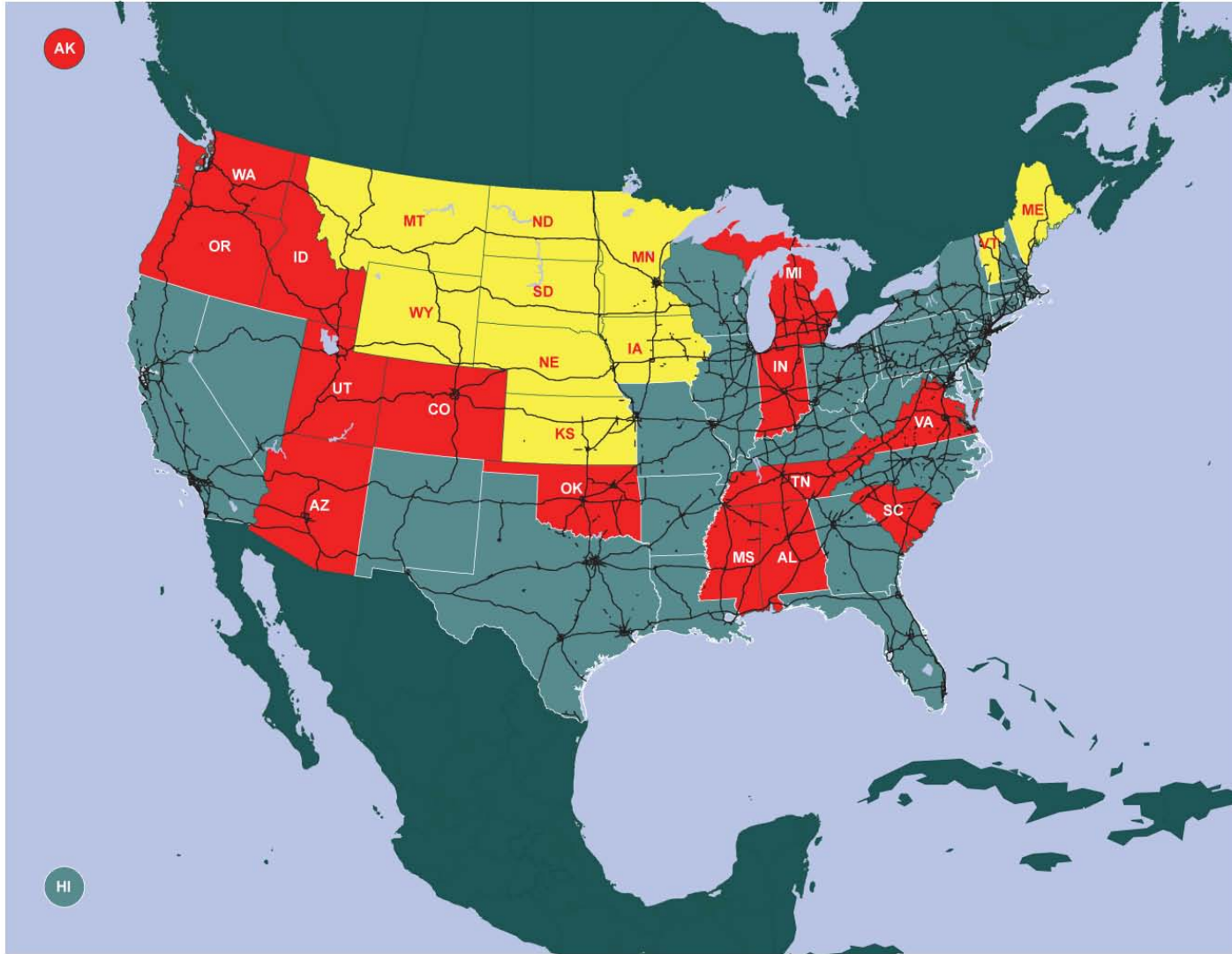


Select State Comparison – Population Density



Select State Comparison – Population Growth





Let's Rebuild America
Infrastructure Index
NORTH AMERICA

US CHAMBER OF COMMERCE

TRANSPORTATION
INDEX -
TOP 25 STATES

- Top 10 states
- Next 15 states
- Other 25 states

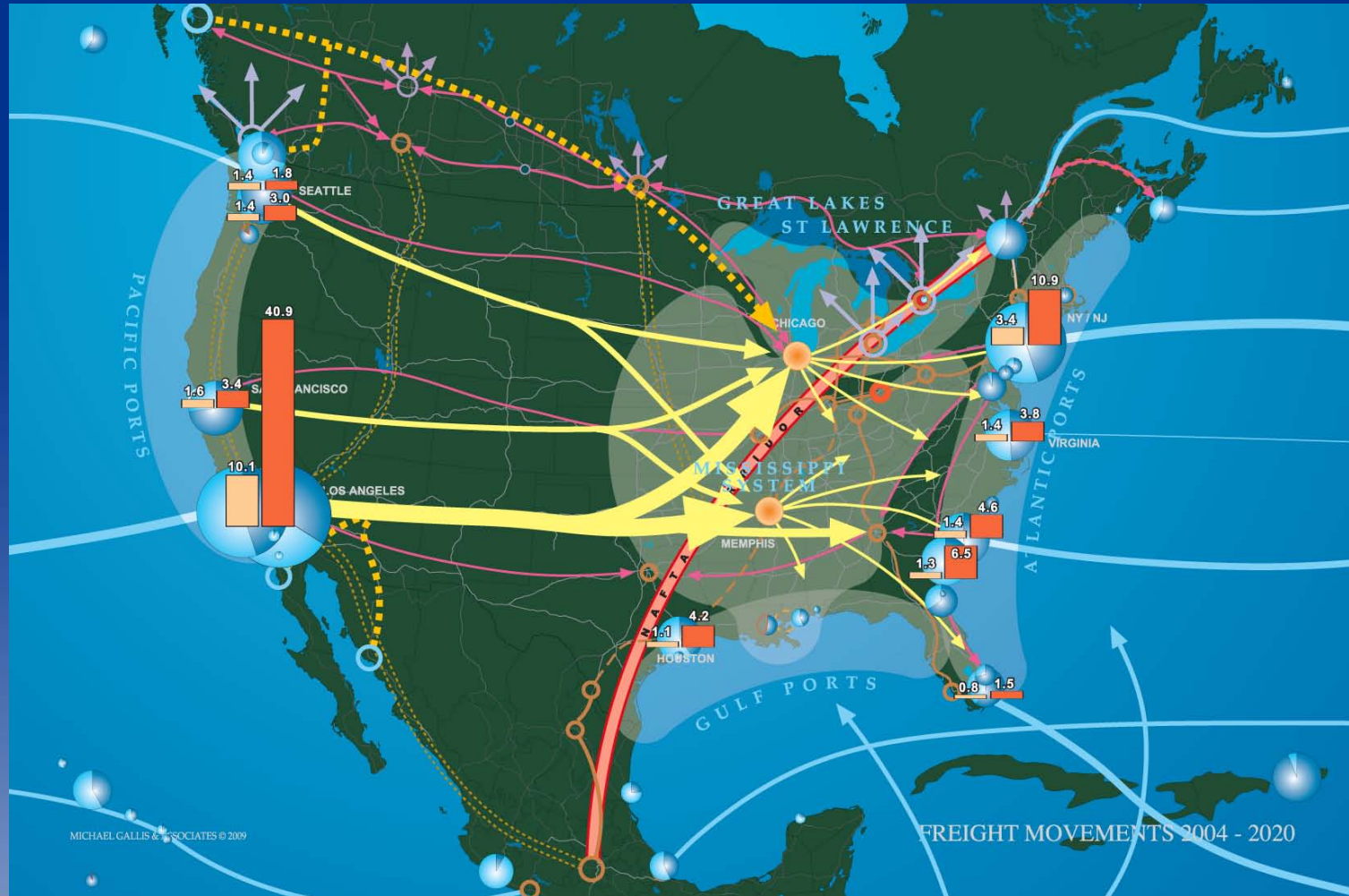
SOURCE: US CHAMBER OF COMMERCE - INFRASTRUCTURE INDEX

Version 1.2 8.23.10



MICHAEL GALLIS & ASSOCIATES

MEASURING SYSTEM PERFORMANCE



Economic Analysis

- Past research has attempted to correlate infrastructure **spending** and economic growth
- Following Sala-i-Martin (1994) and Sanchez-Robles (1998), model form is:

GDP per capita

= f (Index, GDP (level), Government policy,
Population health)

Results

GDP per Capita	Coefficients*
Transportation Index **	0.0037
Real GDP	0.6120
Federal debt	-0.0025
R-squared	0.9953

*All coefficients significant at 0.99.

**Three year lag

Also positive correlation between the index and foreign direct investment.

Observations

- Relationships are non-linear
- Interdependencies are strong
- Challenges require multimodal, life-cycle based solutions
 - No single project
 - No single mode
 - New facilities, infrastructure renewal, improved operations, innovative solutions

THE TRANSPORTATION PERFORMANCE INDEX



**LET'S REBUILD
AMERICA**

- US Chamber of Commerce
 - Janet Kavinoky
 - Murphie Barrett
- Michael Gallis and Associates
 - Michael Gallis
 - Erik Kreh
- Susanne Trimbath
- Tom Skancke
- Workshop participants
- University of Delaware
 - Qiang (Joshua) Li
 - Michelle Oswald
 - TK Foulke
 - Jonathan Calhoun
 - Laura Black
- Transportation Experts
 - James Corbett
 - Mark Hanson
 - Ashish Sen