



Infrastructure Maintenance and Renewal

*Challenges for Local Government
Agencies in the US*

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American Society of Civil Engineers



Local Government (Cities and Counties) Infrastructure Systems

- Transportation
- Airport
- Water Utility
- Wastewater Utility
- Public Buildings and Grounds

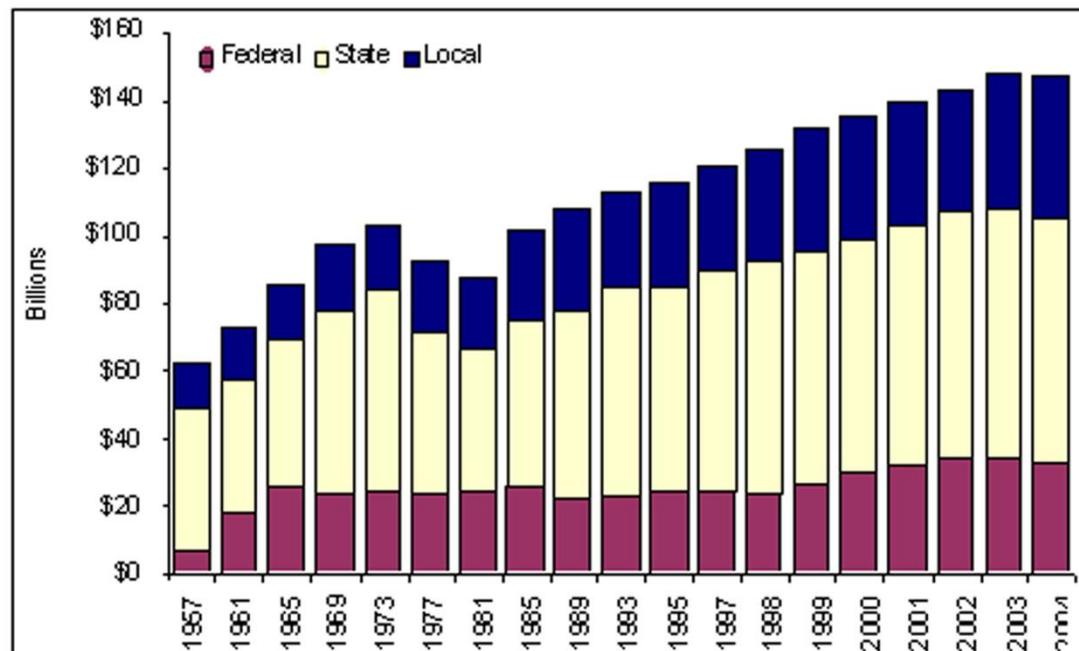


Transportation Funding in US

- Federal Highway Trust Fund (1956)
- Federal, State and Local Roles
- Shifting Resource/Revenue since 1956

Highway Expenditure by Government Type

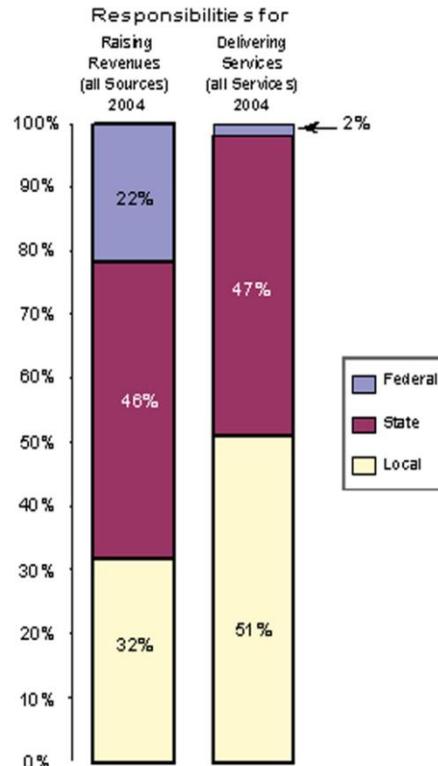
Figure 20. Highway Expenditures by Government Type (1957-2004) in 2004 Dollars



SOURCE: U.S. Department of Transportation, 2006 Conditions and Performance Report, from Highway Statistics Summary to 1995, Table HF-210; Highway Statistics, various years, Tables HF-10A and HF-10. Inflation adjustment—Bureau of Labor Statistics Inflation Calculator.

Revenue vs. Service Delivery Responsibilities

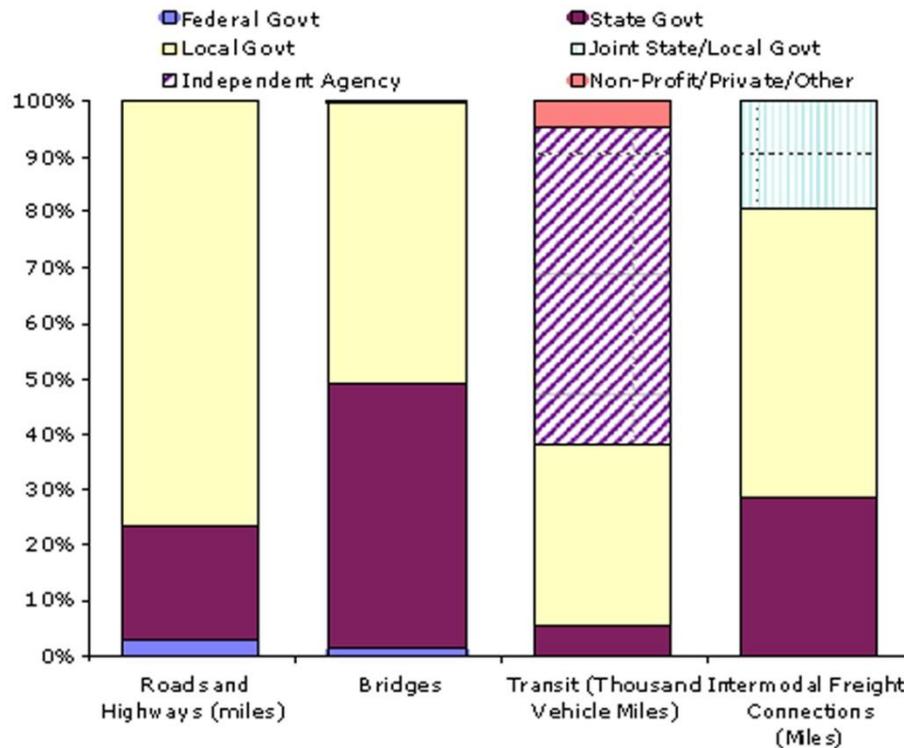
Figure 1. Complex Relationships between Financing and Delivering America's Highway and Transit Services



SOURCE: U.S. DOT, 2006 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance

Transportation System Owners

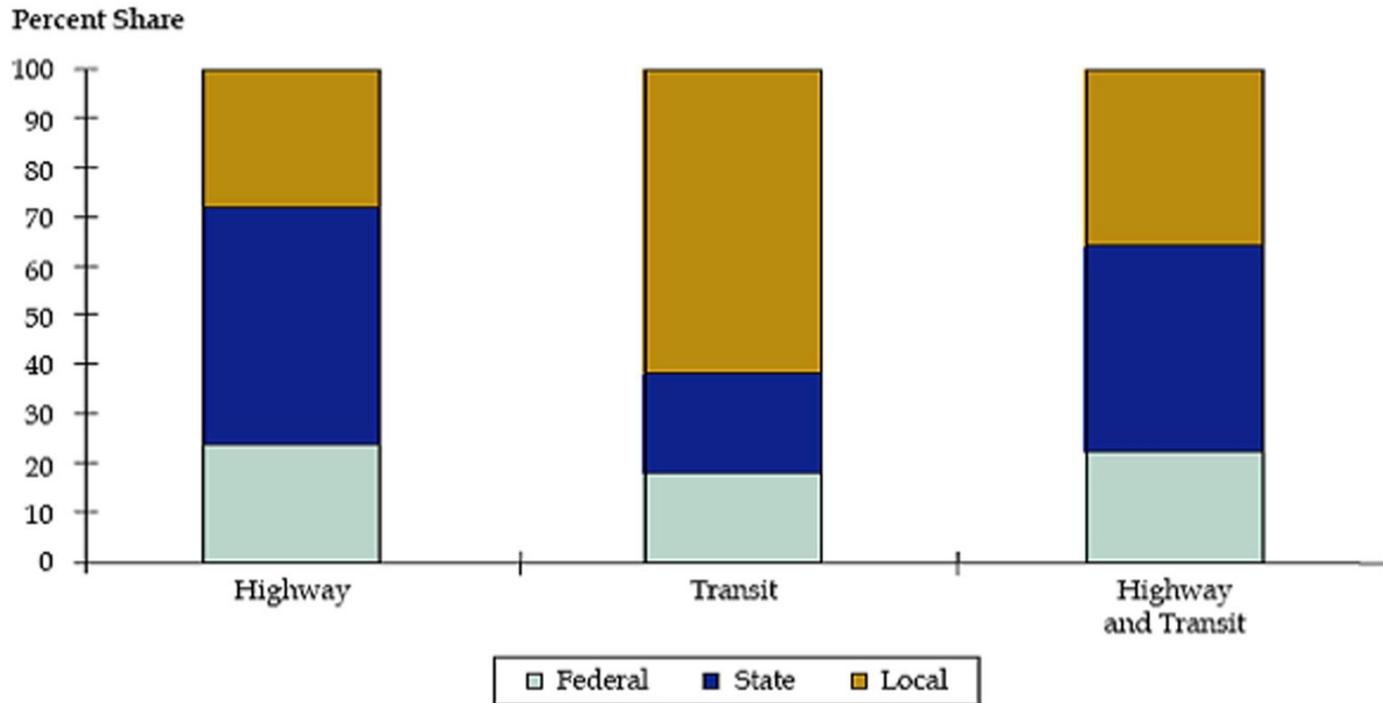
Figure 4. Surface Transportation System Owners



SOURCES: U.S. Department of Transportation, 2006 Conditions and Performance Report; Federal Transit Administration, National Transit Database 2004; Federal Highway Administration, 1999 FHIS Intermodal Freight.

Federal, State and Local Transportation Funding

Figure 8. 2004 Highway and Transit Funding by Level of Government



SOURCE: NCHRP Report, Figure 2.7, p. 2-12.



California Example of Transportation Funding

- Transportation Funding in California includes:
 - Federal (HTF allocation)
 - State (State User Taxes)
 - Local (General Fund and “Self Help” funding)

Highway Maintenance Responsibility by Agency in California

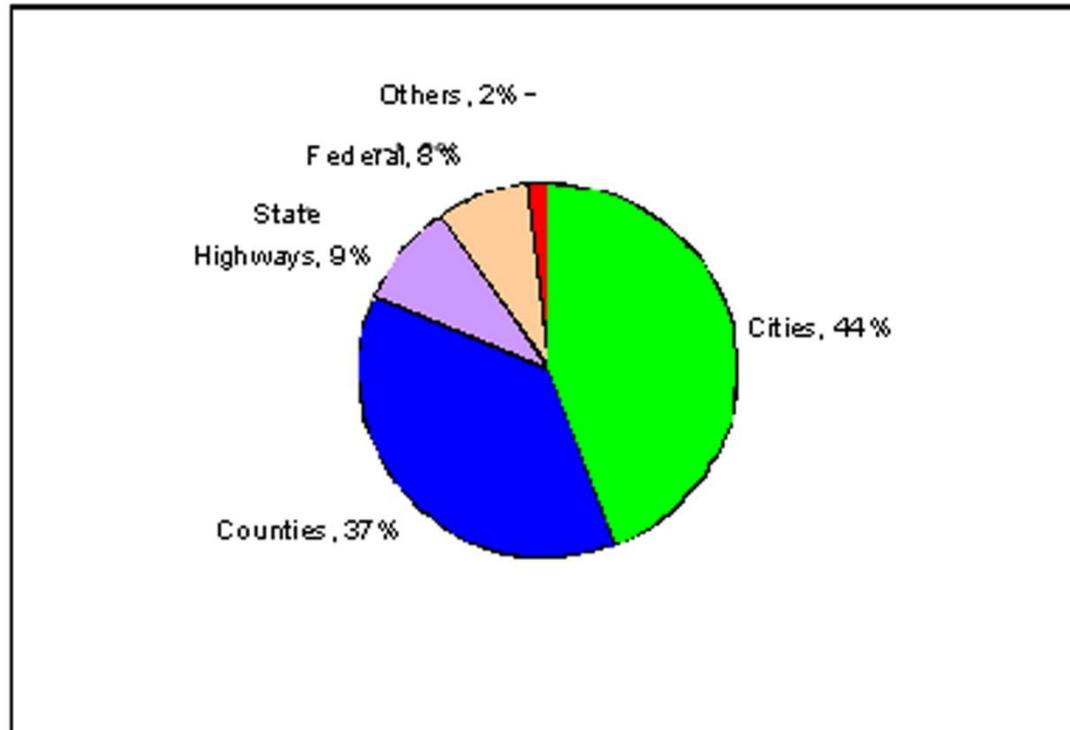


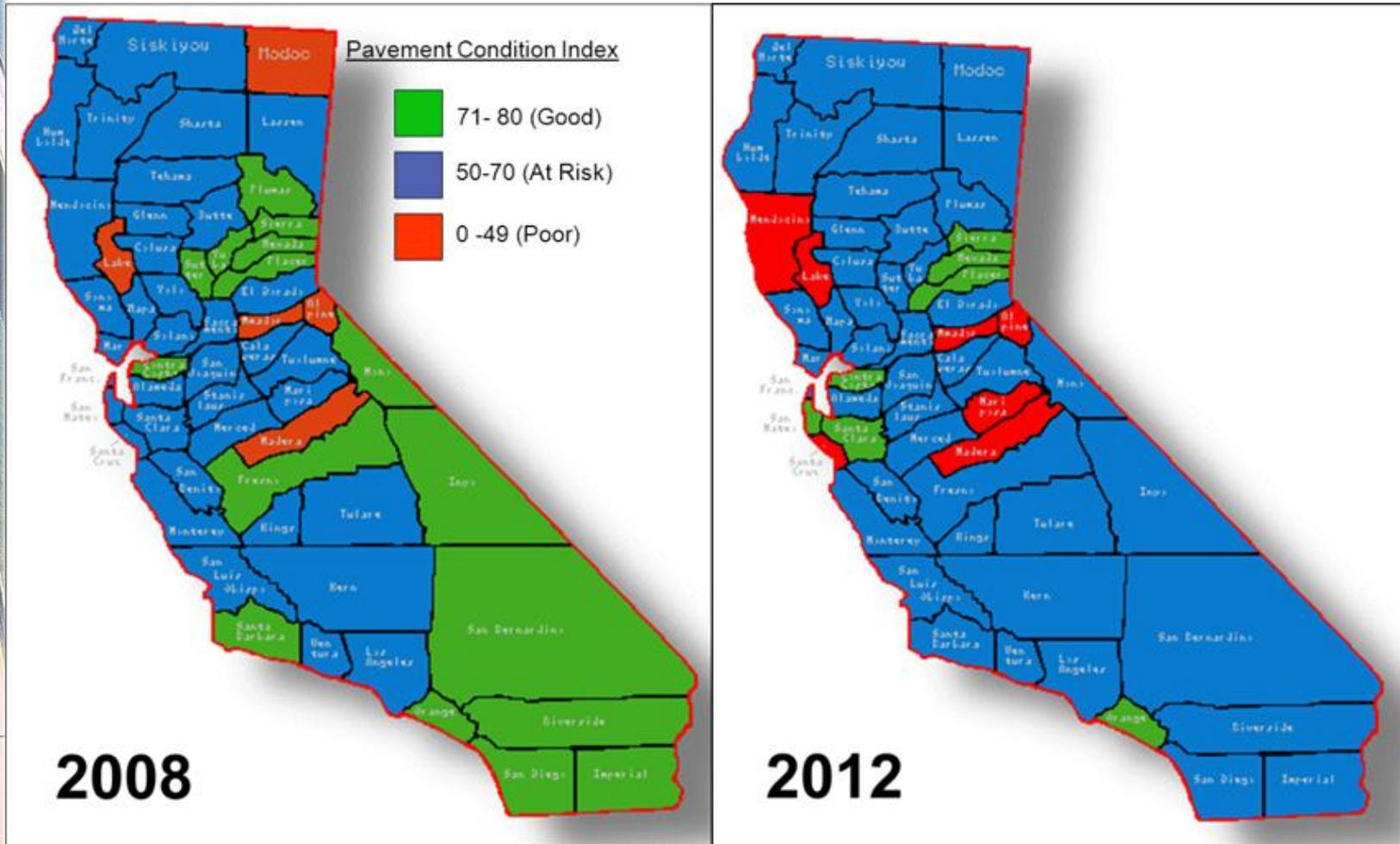
Figure 0.1 Breakdown of Maintained Road Centerline Miles by Agency²



California Local Agency Funding Initiatives

- “Self Help” Counties have successfully achieved super-majority voter approval for transportation funding measures.
- 19 of the 58 Counties in California are in this category and represent 81% of the population of the State.
- Santa Barbara County passed ½ cent sales tax dedicated to Transportation funding in 1989 and extended the measure in 2008 (for another 30 years)

Pavement Condition Trends in California (by County)





California Transportation Funding Need for Local Systems

- Statewide report shows a transportation funding shortfall of over \$82 billion over the next 10 years.
- Current funding level of \$2.5 billion per year would require an additional \$1.9 billion per year just to maintain status quo.
- Ongoing deferred road maintenance will create greater transportation, economic and environmental impacts.

Definitions of Sustainability for Transportation Systems

- Definitions include: “Meeting the needs of the present without compromising the ability of future generations to meet their own needs.”
- With limited funding it is critical to ensure that best use of resources are chosen to achieve sustainable transportation



New Strategies for Sustainable Transportation

- Research and Development is not a local agency function
- Dependence upon Federal and State Transportation Agencies and Universities for Research (Transportation Research Board [TRB])
- Pavement Management Systems have become a standard asset management tool for all Transportation Agencies and have helped in communicating the problem.



Elements of Sustainability

- Seven Sustainability Factors:
 - Virgin Material Usage
 - Alternative Material Usage
 - Pavement In-service Monitoring
 - Noise Mitigation
 - Air Quality/Emissions Mitigation
 - Water Quality
 - Energy Usage



Pavement Preservation

- Recycling, reusing and reclaiming materials are prevalent strategies used by most Local Agencies.
- Use of Alternative Materials is less prevalent because of dependence on research to support long-term performance before adoption by Local Agencies.





Sustainability Research Needs for Transportation

- Need for research to develop fundamental data on the relative environmental sustainability of common pavement maintenance treatments.
- Need for treatment specific life-cycle assessment and cost analysis methods that include values for factors such as: carbon sequestration, resource renewability.
- Need for research to quantify the contribution that crack sealing makes to environmental sustainability of all types of pavement surfaces and its appropriate role in sustainable pavement preservation and maintenance.

Other Local Government Infrastructure System Needs

- Airports are funded through the Federal Airport Trust Fund and user fees and leases.
- For Water and Wastewater Utilities the funding comes from user fees and tends to be adequate for operations but limited for capital program needs. The reliability of fees makes bonding and other loan programs reasonable options for funding.
- Public Buildings and Grounds compete with other General Fund programs and are more challenging to fund adequately.

Sustainability Goals for Local Agency Infrastructure

- All systems must utilize cost effective and sustainable strategies to meet operation and maintenance requirements into the future.
- Tools like the Institute for Sustainability env|SI on certification program for non-building infrastructure are gaining support.
- Life-cycle costing and environmental sustainability factors help to reinforce maintenance and construction practices that recognize long-term impacts and needs.





Questions