



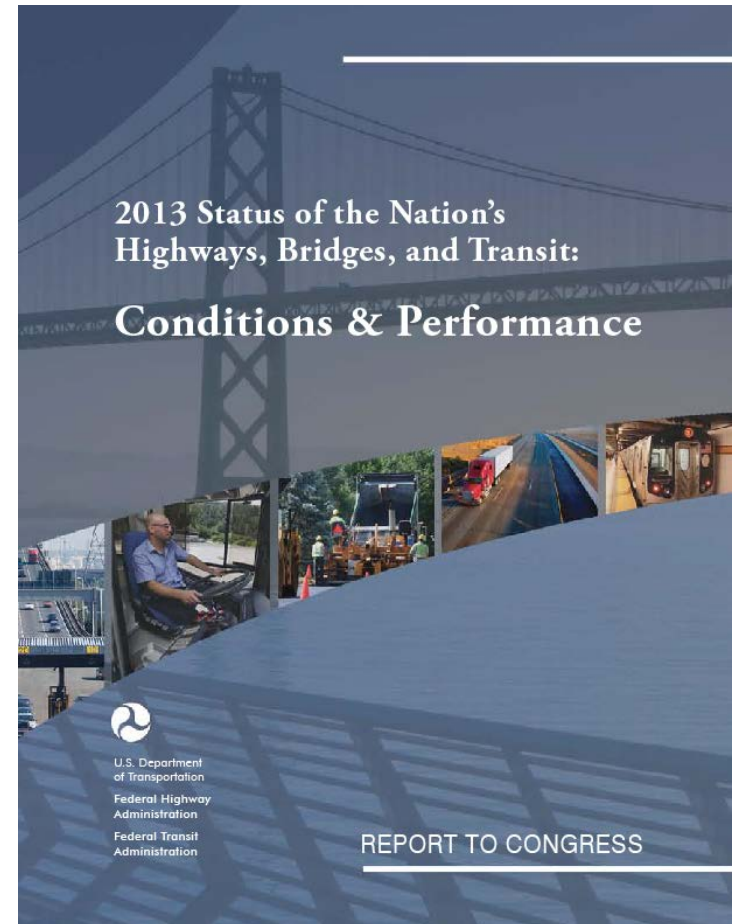
***2013 Status of the Nation's Highways, Bridges,
and Transit: Conditions and Performance
Report to Congress***

Overview & Key Interstate Highway Findings

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C&P Report Highway Findings

- ▶ **Overview**
 - Purpose & History
 - Report Structure
- ▶ 2013 C&P Key Retrospective Findings
- ▶ 2013 C&P Key Prospective Findings



Report Background

- ▶ Biennial report series dates back to 1968
 - 11 Highway-only Reports (1968 – 1991)
 - 4 Transit-only Reports (1984 – 1990)
 - 10 Combined Reports (1993 – 2013)
- ▶ **2013 edition** transmitted to Congress in January 2014
 - Based primarily on 2010 data
 - Used 2008 HPMS sample data
- ▶ 2015 edition in clearance - Based primarily on 2012 data
- ▶ 2017 edition underway - Based primarily on 2014 data

Report Purpose

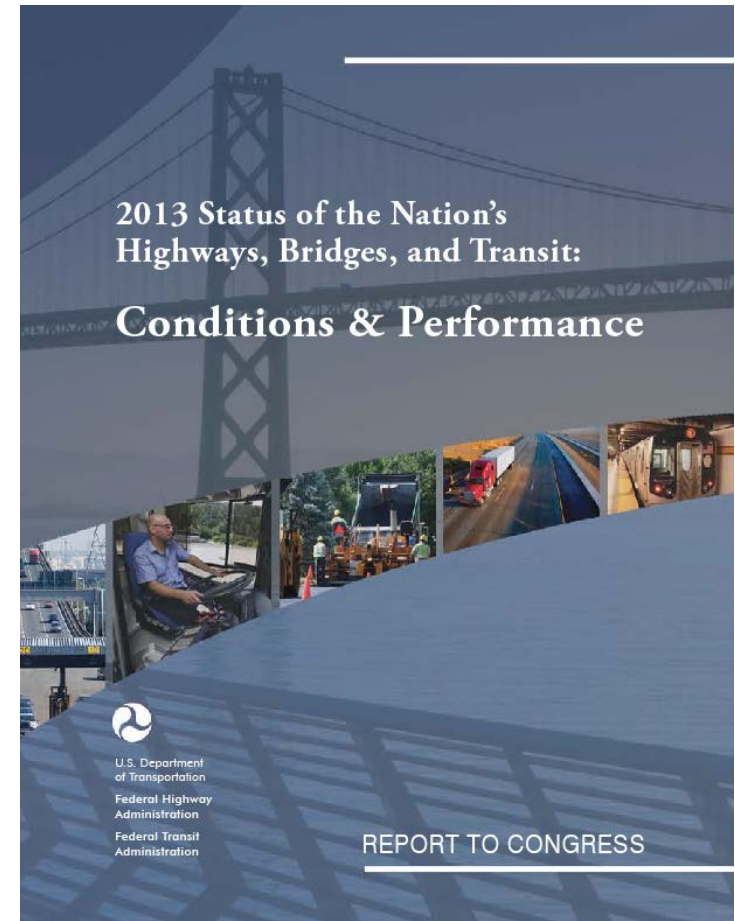
- ▶ To provide Congress and other decision makers with an objective appraisal of highway, bridge and transit physical conditions, operational performance, and financing mechanisms
 - Retrospective: current state of the system
 - Prospective: projected state of the system under alternative 20-year future capital investment scenarios
 - **Does not say how big the Federal program should be!**
- ▶ Meets Requirements of
 - 23 USC 23 U.S.C. 503(b)(8); 49 U.S.C. 308(e)

Report Structure

- ▶ Introduction, Executive Summary, Chapter Overviews
- ▶ Part I: Description of Current System
- ▶ Part II: Investment/Performance Analysis
- ▶ Part III: Special Topics
 - (11-Transportation Serving Federal and Tribal Lands, 12-Center for Accelerating Innovation, 13-National Fuel Cell Bus Program)
- ▶ Part IV: Recommendations for the HPMS
 - (HPMS = Highway Performance Monitoring System)
- ▶ Part V: Appendices (Analysis Methodology)

C&P Report Highway Findings

- ▶ Overview
- ▶ **2013 C&P Key Retrospective Findings**
(Part I: Description of Current System)
 - 1-Household Travel and Freight Movement
 - 2-System Characteristics
 - 3-System Conditions
 - 4-Safety
 - 5-System Performance
 - 6-Finance
- ▶ 2013 C&P Key Prospective Findings



Findings: Chapter 2

System Characteristics

Miles, Bridges, and VMT - 2010				
	All Public Roads	Federal-Aid Highways	National Highway System	Interstate System
Route Miles	4.08 million	1.01 million	162,698	47,182
Lane Miles	8.62 million	2.45 million	573,744	215,919
Vehicle Miles Traveled	2.99 trillion	2.53 trillion	1.30 trillion	0.72 trillion
Bridges	604,493	319,108*	116,669	55,339

* Off-system bridges are eligible for Federal-aid.

System Conditions: Interstate Pavements

Percent of travel (VMT) on Interstate Pavements with Good or Acceptable Ride Quality							
Calendar Year	2000	2002	2004	2006	2008	2010	
Rural Interstate							
Percent Good Ride Quality	70%	72%	74%	79%	79%	79%	
Percent Acceptable	97%	97%	98%	98%	97%	91%	
Urban Interstate							
Percent Good Ride Quality	44%	45%	49%	54%	56%	65%	
Percent Acceptable	91%	90%	90%	93%	92%	90%	

Ride quality is measured in inches of pavement roughness per mile via the International Roughness Index (IRI). IRI < 95 is considered "Good"; IRI <= 170 is considered "Acceptable" (which includes "Good").

Findings: Chapter 3

System Conditions: Interstate Bridges

Percent of Structurally Deficient or Functionally Obsolete Interstate Bridges							
		2000	2002	2004	2006	2008	2010
Rural Interstate Bridges							
	Structurally Deficient	4.0%	4.1%	4.3%	4.3%	4.5%	4.5%
	Functionally Obsolete	13.2%	12.9%	12.8%	12.0%	11.8%	11.6%
	Total Deficient	17.2%	17.0%	17.1%	16.3%	16.3%	16.1%
Urban Interstate Bridges							
	Structurally Deficient	6.7%	6.5%	6.3%	6.0%	5.9%	5.4%
	Functionally Obsolete	23.8%	23.0%	23.3%	23.6%	23.9%	23.0%
	Total Deficient	30.5%	29.5%	29.6%	29.6%	29.8%	28.4%

Safety Performance:

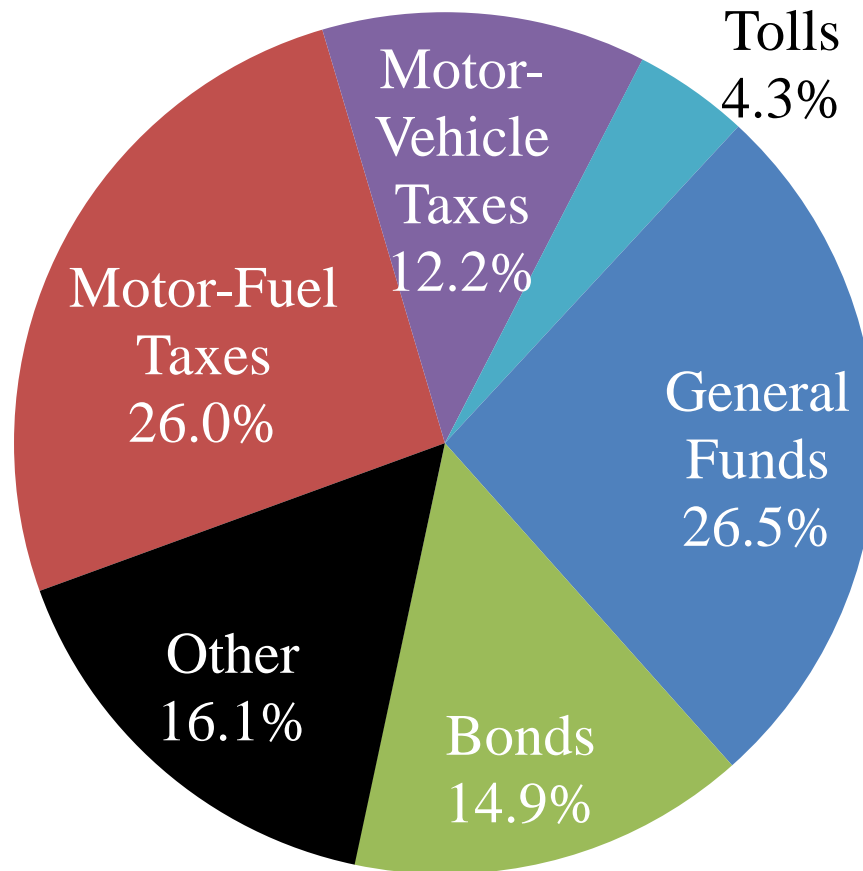
Highway Fatality Rates per 100 Million VMT						
	2000	2002	2004	2006	2008	2010
Rural Interstate	1.21	1.18	1.21	1.12	1.00	0.86
Urban Interstate	0.61	0.61	0.57	0.56	0.48	0.44

- Annual number of rural Interstate highway fatalities was reduced by 34.9 percent from 3,254 in 2000 to 2,119 in 2010.
- Annual number of urban Interstate highway fatalities was reduced by 12.8 percent from 2,419 in 2000 to 2,110 in 2010.

Findings Chapter 6 :

Revenue Sources for Highways

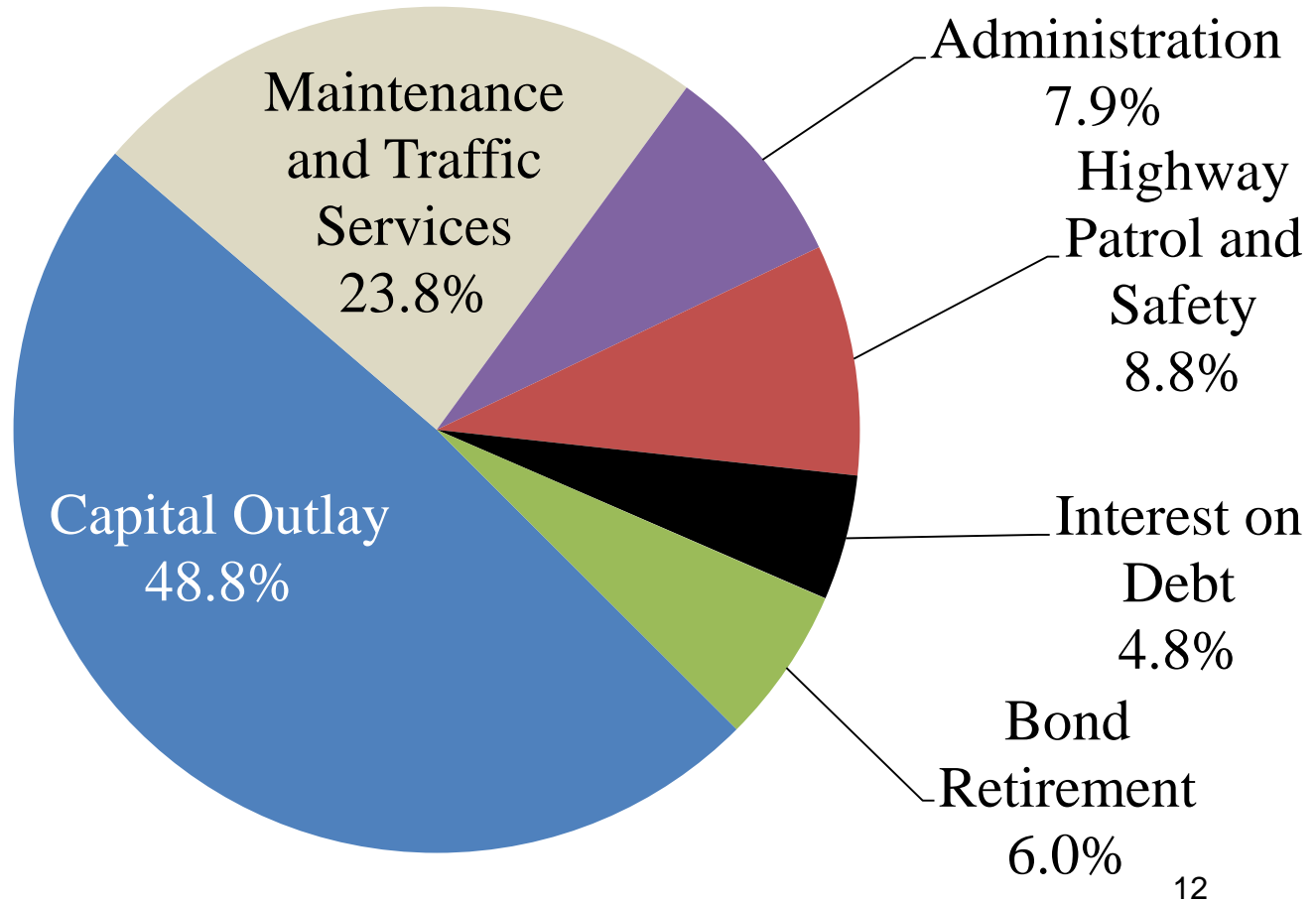
**Total Federal, State and Local Government Revenue in 2010:
\$221.0 Billion**



General Funds reflect \$11.9 billion of Recovery Act funds spent in 2010 and \$14.7 billion transferred to the Highway Account of the Highway Trust Fund in 2010

Highway Expenditures

Total Federal, State and Local Government Expenditures in 2010: \$205.3 Billion

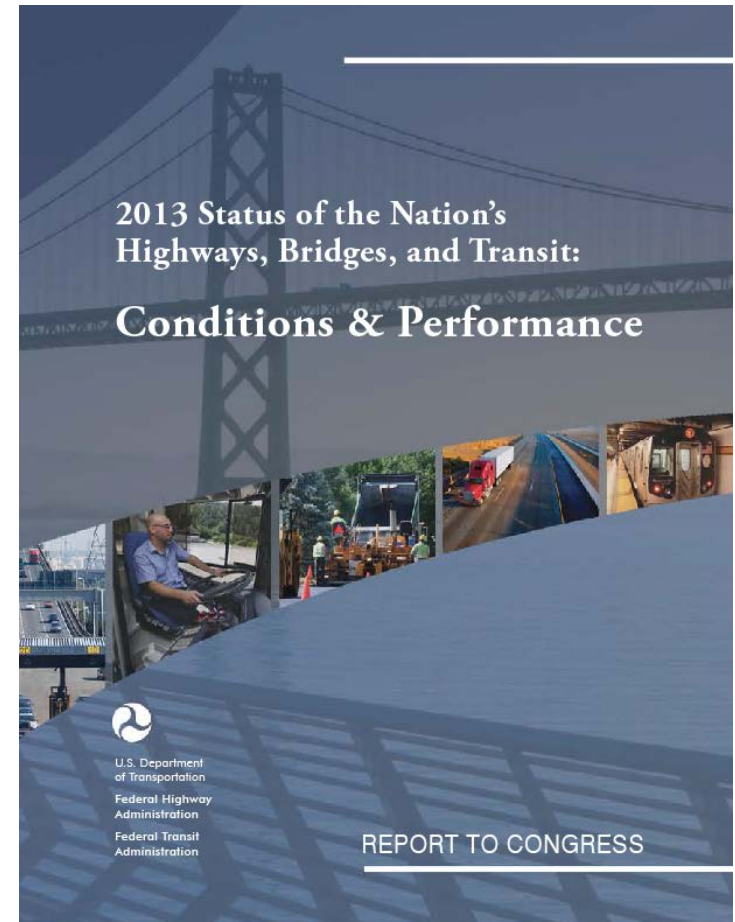


Highway Capital Outlay

Capital Outlay Trends						
	2000	2002	2004	2006	2008	2010
Total Capital Outlay (\$Billions)	\$61.3	\$68.2	\$70.3	\$80.2	\$90.4	\$100.2
Portion Funded by Federal Government	42.6%	46.1%	43.8%	43.1%	41.6%	44.3%
Capital Outlay on the Interstate System (\$B)	\$13.8	\$15.3	\$13.7	\$16.5	\$20.0	\$20.2
Portion Used for System Rehabilitation	53.7%	52.1%	50.8%	49.9%	53.9%	66.7%
Portion Used for System Expansion	39.6%	38.5%	40.9%	42.6%	38.9%	26.3%
Portion Used for System Enhancements	6.7%	9.4%	8.3%	7.4%	7.1%	6.9%

C&P Report Highway Findings

- ▶ Overview
- ▶ 2013 C&P Key Retrospective Findings
- ▶ **2013 C&P Key Prospective Findings**
(Part II: Investment/Performance Analysis)
 - Introduction
 - 7-Potential Capital Investment Impacts
 - 8-Selected Capital Investment Scenarios
 - 9-Supplemental Scenario Analysis
 - 10-Sensitivity Analysis



Investment/Performance Models

- ▶ **Highway Economic Requirements System**
 - Investment in highway widening and preservation on Federal-Aid highways
 - Including bridge widening as part of highway widening projects
- ▶ **National Bridge Investment Analysis System**
 - Investment in bridge rehabilitation on all highway classes.
- ▶ **HERS and NBIAS evaluate investment needs using a combination of:**
 - Technical adequacy (engineering) criteria
 - Benefit-cost (economic) criteria
- ▶ **Scenarios adjusted to account for other types of capital spending**

Highway Economic Requirements System

- ▶ Utilizes HPMS sample section data (100,000+ samples)
 - Identifies deficient sections based on engineering criteria
 - Evaluates potential improvements to deficient sections on the basis of economic benefits and project costs
 - Considers impacts of deployments of operations strategies and ITS
 - Consider travel demand elasticity (impact of user costs on future VMT)
- ▶ Benefits estimated by HERS are based on reductions in
 - User costs (travel time costs, vehicle operating costs, and crash costs)
 - Agency costs (maintenance costs)
 - Emissions costs (now includes greenhouse gas impacts)

National Bridge Investment Analysis System

- ▶ Analysis conducted for individual bridges, at the bridge element level.
 - Software can process element level data but typically synthesizes it.
 - Bridge characteristic and condition data reported in the National Bridge Inventory feeds a set of synthesis, quantity and condition models.
- ▶ Evaluates potential Maintenance, Repair & Rehabilitation actions to be applied on the basis of benefits and project costs
- ▶ Evaluates functional improvement needs
 - Widening, raising, strengthening
 - Considers replacement if functional improvement is infeasible

Future Capital Investment Scenarios

▶ **Sustain 2010 Spending**

- Projects impacts of sustaining spending at base year 2010 levels for 20 years in constant dollar terms

▶ **Maintain Conditions and Performance**

- Maintains overall system conditions and performance at base year 2010 levels through 2030.

▶ **Improve Conditions and Performance**

- Implements all potential improvements with a benefit-cost ratio (BCR) of 1.0 or higher by 2030.
- Addresses the current backlog of \$808.2 billion (\$189.4 billion Interstate)

Findings: Chapter 8

Interstate Highway Investment Scenarios

Average Annual Spending (\$B 2010) for 2011 to 2030	
Scenario	Assuming Forecast-Based Future VMT Growth (From HPMS)
Sustain 2010 Spending	\$20.2
Maintain Conditions and Performance	\$17.4
Improve Conditions and Performance	\$33.1

Amounts shown represent combined investment by all levels of government not just the Federal portion.

Forecast-Based Interstate Scenarios: Projected Changes in 2030 Interstate System Performance Indicators Compared with 2010

Scenario (Assuming Forecast-Based VMT Growth)	Average Annual Investment		Percent Change in:		Average Bridge Sufficiency Rating
	(Billions of \$2010)	Difference Relative to 2010 (%)	Average IRI	Average Delay	
Sustain 2010 Spending	\$20.2	0.0%	-12.7%	1.0%	84.0
Maintain Conditions and Performance	\$17.4	-14.1%	-6.5%	10.1%	82.3
Improve Conditions and Performance	\$33.1	64.0%	-32.9%	-39.5%	84.5
					(2010=82.3)

Sensitivity Analysis

- ▶ Tested sensitivity of HERS model projections to changes in certain model inputs:
 - Values of travel time and safety
 - Growth in the value of time
 - Discount rate
 - Alternative future fuel price assumptions
- ▶ Alternative Investment Strategies
 - Alternative bridge maintenance, repair and rehabilitation (MR&R) strategies (sustain steady state, minimize MR&R, maximize average returns and state of good repair)
 - Impacts of accelerating Operations/ITS deployments (aggressive deployment, full immediate deployment)

Findings: Chapter 10

Sensitivity Analysis on Highway Scenarios

Average Annual Spending (\$B 2010) for 2011 to 2030

Parameter Change	Improve C&P
Baseline	\$145.9
Lower Value of Time	\$134.9
Higher Value of Time	\$153.3
Lower Value of Statistical Life	\$142.4
Higher Value of Statistical Life	\$148.9
3 Percent Discount Rate	\$177.3
Higher Future Fuel Prices	\$124.5
Aggressive ITS/Operations	\$151.5

Findings: Chapter 8

Systemwide Highway Investment Scenarios

Average Annual Spending (\$B 2010) for 2011 to 2030		
Scenario	Forecast-Based VMT Growth (1.85%/Year)	Trend-Based VMT Growth (1.36%/Year)
Sustain 2010 Spending	\$100.2	\$100.2
Maintain Conditions and Performance	\$86.3	\$65.3
Improve Conditions and Performance	\$145.9	\$123.7

Amounts shown represent combined investment by all levels of government not just the Federal portion.

Questions?