List of Exhibits

Executive Summary

Chapter 1	
Percent of Household-Based Vehicle Miles by Purpose, 1969–2009	ES-1
Average Commute Time and Distance by Mode	ES-1
Chapter 2	
Percentage of Highway Miles, Bridges, and Vehicle Miles Traveled by Functional System	ES-2
Highway Functional Classification System	ES-2
Transit Urban Directional Route Miles by Mode (Millions of Miles)	ES-3
Transit Urban Passenger Miles by Mode (Millions of Miles)	ES-3
Chapter 3	
Percent of NHS VMT on Pavements With Good and Acceptable Ride Quality, 2000-2008	ES-4
Percentage of NHS Bridges Classified as Deficient, 2001–2009	ES-4
2008 Replacement Value of U.S. Transit Assets (Billions of Current Dollars)	ES-5
Distribution of Asset Physical Conditions by Asset Type for All Rail	ES-5
Chapter 4	
Travel Time Index by Urbanized Area Size, 2000–2008	ES-6
Average Daily Percent of VMT Under Congested Conditions for All Urbanized Areas, 2000–2008	ES-6
Vehicle Occupancy Averages by Mode	ES-7
Change From 2000 to 2008 in Vehicle Revenue Miles by Mode (Millions of Miles)	ES-7
Change From 2000 to 2008 in Vehicle Revenue Miles per Active Vehicle	ES-7
Chapter 5	
Highway Fatality Rates, 2000 to 2008	ES-8
Highway Injury Rates, 2000 to 2008	ES-8
Annual Transit Fatality (Non-Suicide/Homocide) Count and Rate, 2000–2008	ES-9
Annual Transit Incidents and Injuries by Mode, 2004–2008	ES-9
Chapter 6	
Highway Expenditures by Type, 2008	ES-10
Revenue Sources for Highways, 2008	ES-10
2008 Public Transit Revenue Sources (Billions of Dollars)	ES-11
2008 Transit Capital Expenditures by Mode (Millions of Dollars)	ES-11
Chapter 7	
Projected Changes in 2028 Highway Condition and Performance Measures Compared With 2008 Levels, for Different Spending Growth Rates Relative to 2008	ES-14

Impact of Sustaining Spending at 2008 Levels Through 2028 on Economic Bridge Investment BacklogES-14
2008 Transit Capital Expenditures (Billions of Dollars)ES-15
Chapter 8
Average Annual Investment Levels for Selected Highway Scenarios (Billions of 2008 Dollars) ES-16
Impact of Investing at the State of Good Repair Benchmark Level on Pavement Ride Quality ES-16
Annual Average Cost by Investment Scenario (2008–2028) ES-17
Chapter 9
Cost of Maintaining System Components Versus Maintain Conditions and Performance Scenario for Federal-Aid Highways (Billions of 2008 Dollars)
Potential Impact of Congestion Pricing on 2028 System Performance Measures Compared With 2008, for Different Average Annual Investment Levels
Annual Change in Passenger Miles Traveled, All Urbanized and Rural Areas ES-19
Chapter 10
Projected Changes in 2028 Average Speed Compared With 2008 for Different Spending Growth Rates and Two Constant Price VMT Growth AssumptionsES-20
Impact of Alternative Replacement Condition Thresholds on Transit Preservation Investment Needs by ScenarioES-21
Impact of Alternative Value of Time Rates for Selected Transit Scenarios (Billions of 2008 Dollars)

Main Report

Exhibit 1-1	VMT by Age Group, 2000–2050	1-3
Exhibit 1-2	Annual Trip Rates and Vehicle Ownership by Race and Ethnicity	1-4
Exhibit 1-3	Key Demographic and Travel Characteristics of New Immigrants	1-5
Exhibit 1-4	Immigrant Households with No Vehicle by Number of Years Residency in the U.S	1-5
Exhibit 1-5	Number of Persons Aged 15 Years and Older Added to the U.S. Population, 1910–2000, and Forecast for 2025	1-6
Exhibit 1-6	Share of Drivers by Age Group, 1965–2005	1-6
Exhibit 1-7	Measures Related to Growth of Vehicle Travel, 1969 and 2009	1-7
Exhibit 1-8	Trends in Annual Person Trips per Household by Mode of Travel, 1977–2009	1-8
Exhibit 1-9	Percent of Trips Made by Vehicle and Walking	1-9
Exhibit 1-10	Most Important Issues for the Traveling Public	1-9
Exhibit 1-11	Percent of Vehicle Trips Made on Interstates/Highways (Toll and Nontoll) for Specified Purposes	1-9
Exhibit 1-12	Percent of Household-Based Vehicle Miles by Purpose, 1969–2009	1-10
Exhibit 1-13	Average Commute Time and Distance by Mode	1-10
Exhibit 1-14	Proportion of "Mandatory" and "Flexible" Morning and Evening Peak Vehicle Trips on Weekdays	1-12
Exhibit 1-15	Percent of Household Vehicles by Vehicle Type	1-13
Exhibit 1-16	Average Annual CO ₂ Emissions From Vehicle Travel by Household Characteristics	1-14

Exhibit 2-1	Highway Miles by Owner and by Size of Area, 2000–2008	2-3
Exhibit 2-2	Highway Functional Classification System Hierarchy	2-4
Exhibit 2-3	Percentage of Highway Miles, Lane Miles, and VMT by Functional System and by Size of Area, 2008	2-5
Exhibit 2-4	Highway Route Miles by Functional System, 2000–2008	2-6
Exhibit 2-5	Highway Lane Miles by Functional System and by Size of Area, 2000–2008	2-7
Exhibit 2-6	Annual VMT Growth Rates, 1978–2008	2-8
Exhibit 2-7	Vehicle Miles Traveled (VMT) and Passenger Miles Traveled (PMT), 2000–2008	2-9
Exhibit 2-8	Licensed Drivers, Vehicle Registrations, and Resident Population, 2000–2008	2-10
Exhibit 2-9	Highway Travel by Functional System and by Vehicle Type, 2000–2008	2-11
Exhibit 2-10	Federal-Aid Highway Miles, Lane Miles, and VMT, 2000–2008	2-12
Exhibit 2-11	Highway Route Miles, Lane Miles, and VMT on the NHS Compared With All Roads, by Functional System, 2008	2-13
Exhibit 2-12	NHS Mileage by Owner, 2008	2-14
Exhibit 2-13	Interstate Highway Miles, Lane Miles, and VMT, 2000–2008	2-14
Exhibit 2-14	Trucks and Truck Miles by Range of Operations	2-15
Exhibit 2-15	Ton Miles by Truck, 2002	2-15
Exhibit 2-16	Goods Movement by Mode, 2007	2-16
Exhibit 2-17	Weight of Shipments by Transportation Mode (Millions of Tons)	2-17
Exhibit 2-18	The Spectrum of Freight Moved in 2007	2-18
Exhibit 2-19	Bridges by Owner, 2001–2009	2-25
Exhibit 2-20	Bridge Inventory Characteristics for Ownership, Traffic, and Deck Area, 2009	2-25
Exhibit 2-21	Number of Bridges by Functional System, 2001–2009	2-26
Exhibit 2-22	Bridges by Functional System Weighted by Numbers, ADT, and Deck Area, 2009	2-27
Exhibit 2-23	Number of Bridges by ADT, 2009	2-27
Exhibit 2-24	Interstate, STRAHNET, and NHS Bridges Weighted by Numbers, ADT, and Deck Area, 2009	2-28
Exhibit 2-25	Rail Modes Serving Urbanized Areas, by State	2-31
Exhibit 2-26	Transit Active Fleet by Vehicle Type, 2008	2-33
Exhibit 2-27	Composition of Urban Transit Road Vehicle Fleet, 2008	2-34
Exhibit 2-28	Maintenance Facilities for Directly Operated Services, 2008	2-34
Exhibit 2-29	Transit Rail Mileage and Stations, 2008	2-35
Exhibit 2-30	Transit Urban Directional Route Miles, 2000–2008	2-36
Exhibit 2-31	Rail Vehicle Revenue Miles, 2000–2008	2-37
Exhibit 2-32	2008 Capacity-Equivalent Factors by Mode	2-37
Exhibit 2-33	Capacity-Equivalent Revenue Vehicle Miles, 2000–2008	2-38
Exhibit 2-34	2008 Unlinked Passenger Trips	2-38
Exhibit 2-35	2008 Passenger Miles Traveled	2-39
Exhibit 2-36	Transit Urban Passenger Miles, 2000–2008	2-39
Exhibit 2-37	Transit Ridership Versus Employment	2-40
Exhibit 2-38	Distribution of Rural and Urban Unlinked Passenger Trips Across the United States	2-41
Exhibit 2-39	2008 Rural Transit Vehicles	2-41

Exhibit 2-40	Urban Transit Operators' ADA Vehicle Fleets by Mode, 2008	2-42
Exhibit 2-41	Urban Transit Operators' ADA-Compliant Stations by Mode, 2008	2-43
Exhibit 2-42	Change in Percentage of Urban Bus Fleet Using Alternative Fuels, 2000–2008	2-44
Exhibit 3-1	Pavement Condition Criteria	3-3
Exhibit 3-2	Percent of NHS VMT on Pavements With Good and Acceptable Ride Quality, 2000–2008	3-4
Exhibit 3-3	Percent of VMT on NHS Pavements With Good and Acceptable Ride Quality in Rural and Urban Areas, 2000–2008	3-5
Exhibit 3-4	Percent of VMT on Pavements With Good and Acceptable Ride Quality, by Functional System, 2000–2008	3-6
Exhibit 3-5	Percent of Mileage With Acceptable and Good Ride Quality, by Functional System, 2000–2008	3-7
Exhibit 3-6	Lane Width by Functional Class, 2008	3-8
Exhibit 3-7	Rural Alignment by Functional Class, 2008	3-9
Exhibit 3-8	Bridge Condition Rating Categories	3-11
Exhibit 3-9	Bridge Condition Ratings, 2009	3-12
Exhibit 3-10	Culvert Condition Ratings, 2009	3-12
Exhibit 3-11	Bridge Appraisal Rating Categories	3-13
Exhibit 3-12	Structural Evaluation and Waterway Adequacy Appraisal Ratings, 2009	3-14
Exhibit 3-13	Bridge Appraisal Ratings Based on Geometry and Function, 2009	3-15
Exhibit 3-14	NHS Bridge Deficiences, 2001–2009	3-16
Exhibit 3-15	Systemwide Bridge Deficiencies, 2001–2009	3-16
Exhibit 3-16	Bridge Deficiences by Functional Class, 2001–2009	3-17
Exhibit 3-17	Bridge Deficiencies by Owner, 2009	3-18
Exhibit 3-18	Status of the Federal Bridge Inventory, 2009	3-19
Exhibit 3-19	Bridges by Age Range, as of 2009	3-20
Exhibit 3-20	Bridge Deficiencies by Period Built, as of 2009	3-21
Exhibit 3-21	Definitions of Transit Asset Conditions	3-22
Exhibit 3-22	Distribution of Asset Physical Conditions by Asset Type for All Modes	3-23
Exhibit 3-23	Estimated Replacement Value of the Nation's Transit Assets, 2008	3-23
Exhibit 3-24	Urban Transit Bus Fleet Count, Age, and Condition, 2000–2008	3-24
Exhibit 3-25	Distribution of Estimated Asset Conditions by Asset Type for Bus	3-25
Exhibit 3-26	Urban Transit Rail Fleet Count, Age, and Average Estimated Condition Rating, 2000–2008	3-26
Exhibit 3-27	Distribution of Asset Physical Conditions by Asset Type for All Rail	3-27
Exhibit 3-28	Distribution of Asset Physical Conditions by Asset Type for Heavy Rail	3-27
Exhibit 3-29	Age of Rural Vehicles	3-28
Exhibit 4-1	Sources of Congestion	4-3
Exhibit 4-2	Average Daily Percentage of VMT Under Congested Conditions for All Urbanized Areas, 2000–2008	4-4

Exhibit 4-3	Average Daily Percentage of VMT Under Congested Conditions, by Urbanized Area Size, 2000–2008	
Exhibit 4-4	Travel Time Index by Urbanized Area Size, 2000–2008	
Exhibit 4-5	Average Length of Congested Conditions, Urbanized Areas, 2000–2008	4-6
Exhibit 4-6	National Congestion Measures, 1982–2007	4-7
Exhibit 4-7	Average Truck Speeds on Selected Interstate Highways, 2009	4-8
Exhibit 4-8	Fault Tree for Freeway Bottlenecks	4-10
Exhibit 4-9	Average Transit Passenger-Carrying Speed, 2008	4-18
Exhibit 4-10	Passenger-Mile Weighted Average Operating Speed by Mode	4-18
Exhibit 4-11	Unadjusted Vehicle Occupancy: Passengers per Transit Vehicle, 2000–2008	4-19
Exhibit 4-12	Percentage of Seats Occupied	4-19
Exhibit 4-13	Vehicle Service Utilization: Vehicle Revenue Miles per Active Vehicle by Mode	4-20
Exhibit 4-14	Distribution of Passengers by Wait-Time	4-21
Exhibit 4-15	Passenger Wait-Time According to Household Income	4-21
Exhibit 4-16	Average Distance Between Failures	4-22
Exhibit 5-1	Crashes by Severity, 2000–2008	5-2
Exhibit 5-2	Summary of Fatality and Injury Rates, 1966–2008	5-3
Exhibit 5-3	Fatalities, 1980–2008	5-4
Exhibit 5-4	Fatality Rates, 1980–2008	5-4
Exhibit 5-5	Fatalities by Functional System, 2000–2008	5-5
Exhibit 5-6	Fatality Rates by Functional System, 2000–2008 (per 100 Million VMT)	5-6
Exhibit 5-7	Highway Fatalities by Crash Type, 2000–2008	5-7
Exhibit 5-8	Comparison of Number of Fatalities and Fatality Rates for Vehicles Involved in Rollover Crashes, 2000 and 2008	5-9
Exhibit 5-9	Intersection-Related Fatalities by Functional System, 2008	5-9
Exhibit 5-10	Pedestrian and Other Nonmotorist Traffic Fatalities, 2000–2008	5-10
Exhibit 5-11	Alcohol-Related Fatalities, 2000–2008	5-11
Exhibit 5-12	Fatalities for Vehicle Occupants by Type of Vehicle, 2000–2008	5-13
Exhibit 5-13	Injuries for Vehicle Occupants by Type of Vehicle, 2000–2008	5-13
Exhibit 5-14	Motorcycle Fatalities and Injuries per 100 Million VMT, 2000–2008	5-14
Exhibit 5-15	Annual Transit Fatalities (Non-Suicide/Homicide), 2000–2008	5-16
Exhibit 5-16	Annual Incidents and Injuries, 2004–2008	5-16
Exhibit 5-17	Injuries and Fatalities for Significant Accidents, 2008–2010	5-17
Exhibit 5-18	Annual Transit Fatality Rates by Highway Mode, 2000–2008	5-17
Exhibit 5-19	Annual Fatality Rates by Rail Mode, 2000–2008	5-18
Exhibit 5-20	Transit Incidents and Injuries by Mode, 2004–2008	5-18
Exhibit 5-21	Fatalities per 100 Incidents by Mode, 2004–2008	5-19
Exhibit 5-22	Annual Transit Suicide and Homicide Fatalities, 2000–2008	5-19
Exhibit 6-1	Government Revenue Sources for Highways, 2008	6-2
Exhibit 6-2	Highway Trust Fund Highway Account Receipts and Outlays, Fiscal Years 2000–20	0106-4

Exhibit 6-3	Disposition of Highway-User Revenue by Level of Government, 2008	6-5
Exhibit 6-4	Government Revenue Sources for Highways, 2000–2008	6-4
Exhibit 6-5	Percent of Highway Revenue Derived From User Charges, Each Level of Government, 2000–2008	6-6
Exhibit 6-6	Direct Expenditures for Highways, by Expending Agencies and by Type, 2008	6-7
Exhibit 6-7	Expenditures for Highways by Type, All Units of Government, 2000–2008	6-9
Exhibit 6-8	Funding for Highways by Level of Government, 2000–2008	6-10
Exhibit 6-9	Highway Capital, Noncapital, and Total Expenditures in Current and Constant 2008 Dollars, All Units of Government, 1988–2008	6-11
Exhibit 6-10	Highway Expenditures Funded by Federal and Non-Federal Sources, in Current and Constant 2008 Dollars, 1988–2008	6-12
Exhibit 6-11	Highway Capital Outlay by Improvement Type, 2008	6-14
Exhibit 6-12	Distribution of Capital Outlay by Improvement Type and Functional System, 2008	6-15
Exhibit 6-13	Capital Outlay on All Roads by Improvement Type, 2000–2008	6-16
Exhibit 6-14	Capital Outlay on Federal-Aid Highways, by Improvement Type, 2000–2008	6-17
Exhibit 6-15	Capital Outlay on the NHS, by Improvement Type, 2000–2008	6-17
Exhibit 6-16	Capital Outlay on the Interstate System, by Improvement Type, 2000–2008	6-18
Exhibit 6-17	2008 Revenue Sources for Transit Financing	6-19
Exhibit 6-18	2008 Public Transit Revenue Sources (Billions of Dollars)	6-20
Exhibit 6-19	2008 State Sources of Transit Funding (Millions of Dollars)	6-21
Exhibit 6-20	2008 Local Sources of Transit Funding (Millions of Dollars)	6-21
Exhibit 6-21	Average Fares and Costs per Mile—Top 10 Transit Systems, 2000–2008	6-22
Exhibit 6-22	Public Funding for Transit by Government Jurisdiction, 1990–2008	6-23
Exhibit 6-23	Current and Constant 2008 Dollar Funding for Public Transportation	6-23
Exhibit 6-24	Sources of Funds for Transit Capital Expenditures, 2000–2008	6-24
Exhibit 6-25	2008 Transit Capital Expenditures by Mode and Type	6-25
Exhibit 6-26	Sources of Funds for Transit Operating Expenditures, 2000–2008	6-27
Exhibit 6-27	Transit Operating Expenditures by Mode, 2000–2008	6-27
Exhibit 6-28	2008 Operating Expenditures by Mode and Type of Cost	6-28
Exhibit 6-29	Operating Expenditures per Vehicle Revenue Mile, 2000–2008 (Current Dollars)	6-29
Exhibit 6-30	Growth in Operating Costs—Top 10 Transit Systems, 2000–2008	6-29
Exhibit 6-31	Operating Expenditures per Capacity-Equivalent Vehicle Revenue Mile by Mode, 2000–2008 (Current Dollars)	6-30
Exhibit 6-32	Operating Expenditures per Passenger Mile, 2000–2008 (Current Dollars)	6-30
Exhibit 6-33	Farebox Recovery Ratio by Mode, 2004–2008	6-31
Exhibit 6-34	Rural Transit Operators' Budget Sources for Operating Expenditures, 2008	6-32
Exhibit II-1	Economically Efficient Investment	II-8
Exhibit 7-1	Portion of 2008 Capital Expenditures Equivalent to Investment Types Modeled in HERS and NBIAS (Billions of Dollars)	7-6

Exhibit 7-2	Benefit-Cost Ratio Cutoff Points Associated With Different Possible Funding Levels for Federal-Aid Highways	7-8
Exhibit 7-3	Description of Eight Alternative HERS-Modeled Investment Levels Selected for Further Analysis	7-8
Exhibit 7-4	Minimum and Average Benefit-Cost Ratios for Different Possible Funding Levels for Federal-Aid Highways	7-9
Exhibit 7-5	Projected 2028 Pavement Ride Quality Indicators on Federal-Aid Highways Compared With 2008, for Different Possible Funding Levels	7-10
Exhibit 7-6	Projected 2028 Highway Operational Performance Indicators on Federal-Aid Highways Compared With 2008, for Different Possible Funding Levels	7-12
Exhibit 7-7	Projected Changes in 2028 Highway Travel Delay on Federal-Aid Highways Compared With 2008, for Different Possible Funding Levels	7-13
Exhibit 7-8	Projected Changes in 2028 Highway User Costs on Federal-Aid Highways Compared With 2008 Levels, for Different Possible Funding Levels	7-15
Exhibit 7-9	Analysis of User Cost Savings in 2028 Relative to 2008 at Average VMT Projected for 2028, Federal-Aid Highways	7-17
Exhibit 7-10	Alternative Scenario Targets for Federal-Aid Highways: Maintaining Adjusted User Costs Versus Maintaining Average Speed	7-18
Exhibit 7-11	Alternative Funding Levels Analyzed for the NHS in HERS	7-19
Exhibit 7-12	Projected 2028 Pavement Ride Quality Indicators on the NHS Compared With 2008, for Different Possible Funding Levels	7-21
Exhibit 7-13	Projected Changes in 2028 Speed, Delay, and Highway User Costs on the NHS Compared With 2008, for Different Possible Funding Levels	7-22
Exhibit 7-14	Alternative Funding Levels Analyzed for the Interstate System in HERS	7-23
Exhibit 7-15	Projected 2028 Pavement Ride Quality Indicators on the Interstate System Compared With 2008, for Different Possible Funding Levels	7-24
Exhibit 7-16	Projected Changes in 2028 Speed, Delay, and Highway User Costs on the Interstate System Compared With 2008, for Different Possible Funding Levels	7-25
Exhibit 7-17	Projected Changes in 2028 Economic Bridge Investment Backlog for All Bridges Compared With 2008, for Different Possible Funding Levels	7-27
Exhibit 7-18	Projected Changes in 2028 Economic Bridge Investment Backlog on Federal-Aid Highways Compared With 2008, for Different Possible Funding Levels	7-28
Exhibit 7-19	Projected Changes in 2028 Economic Bridge Investment Backlog on the NHS Compared With 2008, for Different Possible Funding Levels	7-29
Exhibit 7-20	Projected Changes in 2028 Economic Bridge Investment Backlog on the Interstate System Compared With 2008, for Different Possible Funding Levels	7-30
Exhibit 7-21	2008 Transit Capital Expenditures (Billions of Dollars)	7-33
Exhibit 7-22	Impact of Preservation Investment on 2028 Transit Conditions (All Urbanized and Rural Areas)	7-35
Exhibit 7-23	Impact of Preservation Investment on 2028 Transit SGR Backlog (All Urbanized and Rural Areas)	7-36
Exhibit 7-24	New Ridership Supported in 2028 by Expansion Investments (All Urbanized and Rural Areas)	7-38
Exhibit 7-25	Impact of Preservation Investment on 2028 Transit Conditions (Over 1 Million in Population)	7-39

Exhibit 7-26	Impact of Preservation Investment on 2028 Transit SGR Backlog (Over 1 Million in Population)7	7-40
Exhibit 7-27	New Ridership Supported in 2028 by Expansion Investments (Over 1 Million in Population)7	7-41
Exhibit 7-28	Impact of Preservation Investment on 2028 Transit Conditions (Under 1 Million in Population)7	7-42
Exhibit 7-29	Impact of Preservation Investment on 2028 Transit SGR Backlog (Under 1 Million in Population)7	7-43
Exhibit 7-30	New Ridership Supported in 2028 by Expansion Investments (Under 1 Million in Population)7	7-44
Exhibit 8-1	Definitions of Selected Federal-Aid Highway Capital Investment Scenarios, and Average Annual Investment Levels for 2009 to 2028 Associated With Scenario Components	.8-6
Exhibit 8-2	Selected Federal-Aid Highway Capital Investment Scenarios for 2009 to 2028: Comparisons With 2008 Spending and Projected Federal-Aid Highway Performance Indicators	.8-8
Exhibit 8-3	Distribution of Capital Improvement Types for Selected Federal-Aid Highway Capital Investment Scenarios for 2009 to 2028	3-10
Exhibit 8-4	Sustain Current Spending Scenario for Federal-Aid Highways: Distribution of Average Annual Investment for 2009 to 2028 Compared With Actual 2008 Spending, by Functional Class and Improvement Type	3-11
Exhibit 8-5	Maintain Conditions and Performance Scenario for Federal-Aid Highways: Distribution of Average Annual Investment for 2009 to 2028, by Functional Class and Improvement Type	3-12
Exhibit 8-6	Intermediate Improvement Scenario for Federal-Aid Highways: Distribution of Average Annual Investment for 2009 to 2028, by Functional Class and Improvement Type	3-13
Exhibit 8-7	Improve Conditions and Performance Scenario for Federal-Aid Highways: Distribution of Average Annual Investment for 2009 to 2028 Compared With Actual 2008 Spending, by Functional Class and Improvement Type	3-14
Exhibit 8-8	Definitions of Selected Systemwide Capital Investment Scenarios, and Average Annual Investment Levels for 2009 to 2028 Associated With Scenario Components	3-16
Exhibit 8-9	Selected Systemwide Highway Capital Investment Scenarios for 2009 to 2028: Comparisons With 2008 Spending and Projected Systemwide Highway Performance Indicators	8-17
Exhibit 8-10	Distribution of Capital Improvement Types for Selected Systemwide Highway Capital Investment Scenarios for 2009 to 2028	3-18
Exhibit 8-11	Definitions of Selected NHS Capital Investment Scenarios, and Average Annual Investment Levels for 2009 to 2028 Associated With Scenario Components	3-19
Exhibit 8-12	Selected NHS Capital Investment Scenarios for 2009 to 2028: Comparisons With 2008 Spending and Projected NHS Performance Indicators	3-21
Exhibit 8-13	Distribution of Capital Improvement Types for Selected NHS Capital Investment Scenarios for 2009 to 2028	3-22
Exhibit 8-14	Definitions of Selected Interstate Highway System Capital Investment Scenarios, and Average Annual Investment Levels for 2009 to 2028 Associated With Scenario Components	3-24

Exhibit 8-15	Selected Interstate Highway System Capital Investment Scenarios for 2009 to 2028: Comparisons With 2008 Spending and Projected Interstate Highway System Performance Indicators	.8-25
Exhibit 8-16	Distribution of Capital Improvement Types for Selected Interstate Highway System Capital Investment Scenarios for 2009 to 2028	.8-27
Exhibit 8-17	2010 C&P Analysis Scenarios for Transit	.8-28
Exhibit 8-18	Annual Average Cost by Investment Scenario (2008–2028)	.8-29
Exhibit 8-19	Annual Transit Capital Expenditures, 2004 to 2008 (Billions of YOE Dollars)	.8-30
Exhibit 8-20	Sustain Current Spending Scenario: Average Annual Investment by Asset Type, 2008–2028 (Billions of 2008 Dollars)	.8-31
Exhibit 8-21	Sustain Current Spending Scenario: Over-Age Forecast by Asset Category, 2008–2028	.8-31
Exhibit 8-22	Investment Backlog: Sustain Current Spending (\$11.0 Billion Annually)	.8-32
Exhibit 8-23	Sustain Current Spending Scenario: Capacity Utilization by Mode Forecast, 2008–2028	.8-33
Exhibit 8-24	Projected Versus Currently Supported Ridership Growth	.8-34
Exhibit 8-25	SGR Benchmark: Average Annual Investment by Asset Type, 2008–2028 (Billions of 2008 Dollars)	.8-35
Exhibit 8-26	Investment Backlog: SGR Benchmark (\$18.0 Billion Annually)	.8-36
Exhibit 8-27	Proportion of Transit Assets Not in SGR (Excluding Tunnel Structures)	.8-37
Exhibit 8-28	Percent Reduction in Revenue Service Disruptions Relative to 2008 for SGR Benchmark	.8-37
Exhibit 8-29	Low and High Growth Scenarios: Average Annual Investment by Asset Type, 2008–2028 (Billions of 2008 Dollars)	.8-39
Exhibit 8-30	Scenario Investment Benefits Scorecard	.8-41
Exhibit 9-1	Selected Highway Investment Scenario Projections Compared With Comparable Data From the 2008 C&P Report (Billions of Dollars)	9-3
Exhibit 9-2	Average Annual Highway and Bridge Investment Scenario Estimates Versus Current Spending, 1997 to 2010 C&P Reports	9-4
Exhibit 9-3	Primary 1989 C&P Report Investment Scenario Estimates Versus Cumulative Spending, 1987 Through 2005	9-7
Exhibit 9-4	Percent of Mileage With Good and Acceptable Ride Quality, by Functional System, for 1985 and 2005	9-8
Exhibit 9-5	Systemwide Bridge Deficiencies, 1986 and 2006	9-9
Exhibit 9-6	Average Daily Percentage of VMT Under Congested Conditions for All Urbanized Areas, 1987–2005	9-9
Exhibit 9-7	1999 C&P Report Investment Scenario Estimates Versus Cumulative Spending, 1998 Through 2008	.9-11
Exhibit 9-8	Percent of VMT on Pavements With Good and Acceptable Ride Quality, by Functional System, 1997 and 2008	.9-12
Exhibit 9-9	Bridge Deficiencies by Functional System, 1998 and 2009	.9-13
Exhibit 9-10	Average Daily Percentage of VMT Under Congested Conditions for All Urbanized Areas, 1997–2008	.9-13
Exhibit 9-11	Comparison of Capital Investment Scenarios With Recent System Performance for Selected Indicators	.9-15

Exhibit 9-12	Illustration of Potential Impact of Alternative Inflation Rates on Selected Systemwide Investment Scenarios	9-17
Exhibit 9-13	Cost of Maintaining System Components Compared With the Cost to Maintain Scenario for Federal-Aid Highways for 2009 to 2028	9-20
Exhibit 9-14	Estimated Highway and Bridge Investment Backlog as of 2008	9-21
Exhibit 9-15	Distribution of Spending Among 5-Year HERS Analysis Periods and Projected Impacts on Average Speeds, for Alternative Approaches to Investment Timing	9-23
Exhibit 9-16	Distribution of Spending Among 5-Year Periods in NBIAS and Projected Impacts on the Bridge Investment Backlog, for Alternative Approaches to Investment Timing	9-25
Exhibit 9-17	Impact of Alternative Revenue Mechanisms and Congestion Pricing Assumptions on the Level of Potentially Cost-Beneficial HERS-Modeled Investment and on Selected Performance Indicators	9-28
Exhibit 9-18	Impact of Alternative Revenue Mechanisms and Congestion Pricing Assumptions on Selected Performance Indicators, Assuming a Uniform Level of Capital Spending	9-30
Exhibit 9-19	Impact of Alternative Operations Strategies Deployment Rate Assumptions on the Level of Potentially Cost-Beneficial HERS-Modeled Investment and on Selected Performance Indicators	9-32
Exhibit 9-20	Impact of Alternative Bridge Management Strategies on the Projected System Rehabilitation Investment Backlog for All Bridges	9-34
Exhibit 9-21	Asset Condition Forecast for All Transit Assets: Includes Both Existing and Expansion Assets	9-37
Exhibit 9-22	Comparison of Expected Useful Service Life Consumed for All Transit Assets, by Component	9-38
Exhibit 9-23	Passenger Miles Traveled, All Urbanized and Rural Areas	9-39
Exhibit 9-24	Passenger Miles Traveled, UZAs Over 1 Million in Population	9-40
Exhibit 9-25	Passenger Miles Traveled, UZAs Under 1 Million in Population	9-41
Exhibit 9-26	Predicted Versus Actual Capital Reinvestment	9-42
Exhibit 9-27	Predicted Versus "Actual" Asset Conditions as of 2009	9-43
Exhibit 9-28	Summary of TERM Prediction Tests: Capital Reinvestment	9-44
Exhibit 9-29	Predicted Versus Actual Capital Expansion Investment	9-45
Exhibit 9-30	Vehicle Capacity Utilization Rates for Rail and Bus (From NTD)	9-46
Exhibit 9-31	Predicted Versus Actual Capital Expansion	9-46
Exhibit 9-32	Summary of TERM Prediction Tests: Expansion Investments	9-47
Exhibit 10-1	Retail Gasoline and Consumer Price Indices (1982–1984 = 100)	10-3
Exhibit 10-2	Annual Projected Highway VMT Based on HPMS Forecasts	10-3
Exhibit 10-3	Impact of Alternative HERS Constant Price Travel Growth Forecasts on Selected Indicators, for Different Possible Funding Levels	10-5
Exhibit 10-4	Impact of Alternative NBIAS Travel Growth Forecasts on Projected Economic Bridge Investment Backlog in 2028, for Different Possible Funding Levels	10-6
Exhibit 10-5	Impact of Alternative HERS Fuel Price Assumptions on Selected Indicators, for Different Possible Funding Levels	10-8
Exhibit 10-6	Impact of Alternative HERS Construction Cost Index Assumptions on Selected Indicators, for Different Possible Funding Levels	10-10

Exhibit 10-7	Impact of Alternative HERS Value of a Statistical Life Assumptions on Selected Indicators, for Different Possible Funding Levels	10-12
Exhibit 10-8	Impact of Alternative NBIAS Value of a Statistical Life Assumptions on Projected Economic Bridge Investment Backlog in 2028, for Different Possible Funding Levels	10-13
Exhibit 10-9	Impact of Alternative HERS Value of Time Assumptions on Selected Indicators, for Different Possible Funding Levels	10-15
Exhibit 10-10	Impact of Alternative NBIAS Value of Time Assumptions on Projected Economic Bridge Investment Backlog in 2028, for Different Possible Funding Levels	10-16
Exhibit 10-11	Impact of Alternative HERS Reliability Premium Assumptions on Selected Indicators, for Different Possible Funding Levels	10-17
Exhibit 10-12	Impact of Alternative HERS Travel Demand Elasticity Values on Selected Indicators, for Different Possible Funding Levels	10-19
Exhibit 10-13	Impact of Alternative HERS Discount Rates on Selected Indicators, for Different Possible Funding Levels	10-21
Exhibit 10-14	Impact of Alternative NBIAS Discount Rates on Projected Economic Bridge Investment Backlog in 2028, for Different Possible Funding Levels	10-22
Exhibit 10-15	Impact of Alternative HERS High-Cost Transportation Capacity Improvement Assumptions on Selected Indicators, for Different Possible Funding Levels	10-23
Exhibit 10-16	Impact of Alternative Replacement Condition Thresholds on Transit Preservation Investment Needs by Scenario (Excludes Expansion Impacts)	10-26
Exhibit 10-17	Impact of an Increase in Capital Costs on Transit Investment Estimates by Scenario	10-26
Exhibit 10-18	Impact of Alternative Value of Time Rates on Transit Investment Estimates by Scenario	10-27
	-	
Exhibit 10-19	Impact of Alternative Discount Rates on Transit Investment Estimates by Scenario	10-28
Exhibit 10-19 Exhibit 11-1	Impact of Alternative Discount Rates on Transit Investment Estimates by Scenario GHG Emissions	10-28
Exhibit 10-19 Exhibit 11-1 Exhibit 11-2	Impact of Alternative Discount Rates on Transit Investment Estimates by Scenario GHG Emissions CO ₂ Emissions per Passenger Mile Traveled	10-28 11-6 11-7
Exhibit 10-19 Exhibit 11-1 Exhibit 11-2 Exhibit 11-3	Impact of Alternative Discount Rates on Transit Investment Estimates by Scenario GHG Emissions CO ₂ Emissions per Passenger Mile Traveled CO ₂ Emissions per Passenger Mile Traveled for Selected U.S. Heavy Rail Systems	10-28 11-6 11-7 11-7
Exhibit 10-19 Exhibit 11-1 Exhibit 11-2 Exhibit 11-3 Exhibit 11-4	Impact of Alternative Discount Rates on Transit Investment Estimates by Scenario GHG Emissions CO ₂ Emissions per Passenger Mile Traveled CO ₂ Emissions per Passenger Mile Traveled for Selected U.S. Heavy Rail Systems Summary of Other Sustainability Strategies	10-28 11-6 11-7 11-7 11-12
Exhibit 10-19 Exhibit 11-1 Exhibit 11-2 Exhibit 11-3 Exhibit 11-4 Exhibit 12-1	Impact of Alternative Discount Rates on Transit Investment Estimates by Scenario GHG Emissions CO ₂ Emissions per Passenger Mile Traveled CO ₂ Emissions per Passenger Mile Traveled for Selected U.S. Heavy Rail Systems Summary of Other Sustainability Strategies Portion of Gulf Coast Region Highways That Are Vulnerable to Relative Sea Level Rise	10-28 11-6 11-7 11-7 11-12 12-3
Exhibit 10-19 Exhibit 11-1 Exhibit 11-2 Exhibit 11-3 Exhibit 11-4 Exhibit 12-1 Exhibit 13-1	Impact of Alternative Discount Rates on Transit Investment Estimates by Scenario GHG Emissions CO ₂ Emissions per Passenger Mile Traveled CO ₂ Emissions per Passenger Mile Traveled for Selected U.S. Heavy Rail Systems Summary of Other Sustainability Strategies Portion of Gulf Coast Region Highways That Are Vulnerable to Relative Sea Level Rise Passenger Fatality Rate per 100 Million Passenger Miles, 2002–2008	10-28 11-6 11-7 11-7 11-12 12-3 13-5
Exhibit 10-19 Exhibit 11-1 Exhibit 11-2 Exhibit 11-3 Exhibit 11-4 Exhibit 12-1 Exhibit 13-1 Exhibit 13-2	Impact of Alternative Discount Rates on Transit Investment Estimates by Scenario GHG Emissions CO ₂ Emissions per Passenger Mile Traveled CO ₂ Emissions per Passenger Mile Traveled for Selected U.S. Heavy Rail Systems Summary of Other Sustainability Strategies Portion of Gulf Coast Region Highways That Are Vulnerable to Relative Sea Level Rise Passenger Fatality Rate per 100 Million Passenger Miles, 2002–2008 Passenger Injury Rate per 100 Million Passenger Miles, 2002–2008	10-28 11-6 11-7 11-7 11-12 12-3 12-5 13-5
Exhibit 10-19 Exhibit 11-1 Exhibit 11-2 Exhibit 11-3 Exhibit 11-4 Exhibit 12-1 Exhibit 13-1 Exhibit 13-2 Exhibit 13-3	Impact of Alternative Discount Rates on Transit Investment Estimates by Scenario GHG Emissions CO ₂ Emissions per Passenger Mile Traveled CO ₂ Emissions per Passenger Mile Traveled for Selected U.S. Heavy Rail Systems Summary of Other Sustainability Strategies Portion of Gulf Coast Region Highways That Are Vulnerable to Relative Sea Level Rise Passenger Fatality Rate per 100 Million Passenger Miles, 2002–2008 Passenger Injury Rate per 100 Million Passenger Miles, 2002–2008 Distribution of Expenditures in Location-Efficient and Auto-Dependent Environments	10-28 11-6 11-7 11-7 11-12 12-3 12-3 13-5 13-5 13-7
Exhibit 10-19 Exhibit 11-1 Exhibit 11-2 Exhibit 11-3 Exhibit 11-3 Exhibit 11-4 Exhibit 12-1 Exhibit 13-1 Exhibit 13-2 Exhibit 13-3 Exhibit 13-4	Impact of Alternative Discount Rates on Transit Investment Estimates by Scenario GHG Emissions CO ₂ Emissions per Passenger Mile Traveled CO ₂ Emissions per Passenger Mile Traveled for Selected U.S. Heavy Rail Systems Summary of Other Sustainability Strategies Portion of Gulf Coast Region Highways That Are Vulnerable to Relative Sea Level Rise Passenger Fatality Rate per 100 Million Passenger Miles, 2002–2008 Passenger Injury Rate per 100 Million Passenger Miles, 2002–2008 Distribution of Expenditures in Location-Efficient and Auto-Dependent Environments Economic Benefits of Location Efficiency	10-28 11-6 11-7 11-7 11-12 12-3 13-5 13-5 13-7 13-8
Exhibit 10-19 Exhibit 11-1 Exhibit 11-2 Exhibit 11-3 Exhibit 11-3 Exhibit 11-4 Exhibit 12-1 Exhibit 13-1 Exhibit 13-2 Exhibit 13-3 Exhibit 13-4 Exhibit 13-5	Impact of Alternative Discount Rates on Transit Investment Estimates by Scenario GHG Emissions CO ₂ Emissions per Passenger Mile Traveled for Selected U.S. Heavy Rail Systems Summary of Other Sustainability Strategies Portion of Gulf Coast Region Highways That Are Vulnerable to Relative Sea Level Rise Passenger Fatality Rate per 100 Million Passenger Miles, 2002–2008 Passenger Injury Rate per 100 Million Passenger Miles, 2002–2008 Distribution of Expenditures in Location-Efficient and Auto-Dependent Environments Economic Benefits of Location Efficiency Change in Patterns of Land Use in Cuyahoga County, Ohio, 1948 and 2002	10-28 11-6 11-7 11-7 11-12 12-3 12-3 13-5 13-5 13-7 13-8 13-8
Exhibit 10-19 Exhibit 11-1 Exhibit 11-2 Exhibit 11-3 Exhibit 11-3 Exhibit 11-4 Exhibit 12-1 Exhibit 13-1 Exhibit 13-2 Exhibit 13-3 Exhibit 13-4 Exhibit 13-5 Exhibit 13-6	Impact of Alternative Discount Rates on Transit Investment Estimates by Scenario GHG Emissions CO ₂ Emissions per Passenger Mile Traveled CO ₂ Emissions per Passenger Mile Traveled for Selected U.S. Heavy Rail Systems Summary of Other Sustainability Strategies Portion of Gulf Coast Region Highways That Are Vulnerable to Relative Sea Level Rise Passenger Fatality Rate per 100 Million Passenger Miles, 2002–2008 Passenger Injury Rate per 100 Million Passenger Miles, 2002–2008 Distribution of Expenditures in Location-Efficient and Auto-Dependent Environments Economic Benefits of Location Efficiency Change in Patterns of Land Use in Cuyahoga County, Ohio, 1948 and 2002 Potential Livability Performance Measures	10-28 11-6 11-7 11-7 11-12 12-3 13-5 13-5 13-7 13-8 13-8 13-10
Exhibit 10-19 Exhibit 11-1 Exhibit 11-2 Exhibit 11-3 Exhibit 11-3 Exhibit 11-4 Exhibit 12-1 Exhibit 13-1 Exhibit 13-2 Exhibit 13-3 Exhibit 13-4 Exhibit 13-5 Exhibit 13-6 Exhibit A-1	Impact of Alternative Discount Rates on Transit Investment Estimates by Scenario GHG Emissions CO ₂ Emissions per Passenger Mile Traveled CO ₂ Emissions per Passenger Mile Traveled for Selected U.S. Heavy Rail Systems Summary of Other Sustainability Strategies Portion of Gulf Coast Region Highways That Are Vulnerable to Relative Sea Level Rise Passenger Fatality Rate per 100 Million Passenger Miles, 2002–2008 Passenger Injury Rate per 100 Million Passenger Miles, 2002–2008 Distribution of Expenditures in Location-Efficient and Auto-Dependent Environments Economic Benefits of Location Efficiency Change in Patterns of Land Use in Cuyahoga County, Ohio, 1948 and 2002 Potential Livability Performance Measures Social Marginal Cost per Metric Ton of CO ₂ Emission Estimates, in Constant 2008 Dollars	10-28 11-6 11-7 11-7 11-12 12-3 13-5 13-5 13-7 13-8 13-8 13-10 A-5
Exhibit 10-19 Exhibit 11-1 Exhibit 11-2 Exhibit 11-3 Exhibit 11-3 Exhibit 11-4 Exhibit 12-1 Exhibit 13-1 Exhibit 13-2 Exhibit 13-3 Exhibit 13-4 Exhibit 13-5 Exhibit 13-6 Exhibit 13-6 Exhibit A-1 Exhibit A-2	Impact of Alternative Discount Rates on Transit Investment Estimates by Scenario GHG Emissions CO ₂ Emissions per Passenger Mile Traveled CO ₂ Emissions per Passenger Mile Traveled for Selected U.S. Heavy Rail Systems Summary of Other Sustainability Strategies Portion of Gulf Coast Region Highways That Are Vulnerable to Relative Sea Level Rise Passenger Fatality Rate per 100 Million Passenger Miles, 2002–2008 Passenger Injury Rate per 100 Million Passenger Miles, 2002–2008 Distribution of Expenditures in Location-Efficient and Auto-Dependent Environments Economic Benefits of Location Efficiency Change in Patterns of Land Use in Cuyahoga County, Ohio, 1948 and 2002 Potential Livability Performance Measures Social Marginal Cost per Metric Ton of CO ₂ Emission Estimates, in Constant 2008 Dollars Types of Operations Strategies Included in Each Scenario	10-28 11-6 11-7 11-7 11-12 12-3 13-5 13-5 13-5 13-8 13-8 13-8 13-10 A-5 A-7
Exhibit 10-19 Exhibit 11-1 Exhibit 11-2 Exhibit 11-3 Exhibit 11-3 Exhibit 11-4 Exhibit 12-1 Exhibit 13-1 Exhibit 13-2 Exhibit 13-3 Exhibit 13-4 Exhibit 13-5 Exhibit 13-6 Exhibit 13-6 Exhibit A-1 Exhibit A-2 Exhibit A-3	Impact of Alternative Discount Rates on Transit Investment Estimates by Scenario GHG Emissions CO ₂ Emissions per Passenger Mile Traveled CO ₂ Emissions per Passenger Mile Traveled for Selected U.S. Heavy Rail Systems Summary of Other Sustainability Strategies Portion of Gulf Coast Region Highways That Are Vulnerable to Relative Sea Level Rise Passenger Fatality Rate per 100 Million Passenger Miles, 2002–2008 Passenger Injury Rate per 100 Million Passenger Miles, 2002–2008 Distribution of Expenditures in Location-Efficient and Auto-Dependent Environments Economic Benefits of Location Efficiency Change in Patterns of Land Use in Cuyahoga County, Ohio, 1948 and 2002 Potential Livability Performance Measures Social Marginal Cost per Metric Ton of CO ₂ Emission Estimates, in Constant 2008 Dollars Types of Operations Strategies Included in Each Scenario Impacts of Operations Strategies in HERS (Highway Economic Requirements System)	10-28 11-6 11-7 11-7 11-12 12-3 13-5 13-5 13-5 13-7 13-8 13-10 A-5 A-7 0 A-8
Exhibit 10-19 Exhibit 11-1 Exhibit 11-2 Exhibit 11-3 Exhibit 11-3 Exhibit 11-4 Exhibit 12-1 Exhibit 13-1 Exhibit 13-2 Exhibit 13-3 Exhibit 13-4 Exhibit 13-5 Exhibit 13-6 Exhibit 13-6 Exhibit A-1 Exhibit A-2 Exhibit A-3 Exhibit A-4	Impact of Alternative Discount Rates on Transit Investment Estimates by Scenario GHG Emissions CO ₂ Emissions per Passenger Mile Traveled for Selected U.S. Heavy Rail Systems Summary of Other Sustainability Strategies Portion of Gulf Coast Region Highways That Are Vulnerable to Relative Sea Level Rise Passenger Fatality Rate per 100 Million Passenger Miles, 2002–2008 Passenger Injury Rate per 100 Million Passenger Miles, 2002–2008 Distribution of Expenditures in Location-Efficient and Auto-Dependent Environments Economic Benefits of Location Efficiency Change in Patterns of Land Use in Cuyahoga County, Ohio, 1948 and 2002 Potential Livability Performance Measures Social Marginal Cost per Metric Ton of CO ₂ Emission Estimates, in Constant 2008 Dollars Types of Operations Strategies Included in Each Scenario Impacts of Operations Strategies in HERS (Highway Economic Requirements System) Typical Costs per Lane Mile Assumed in HERS, by Type of Improvements	10-28 11-6 11-7 11-7 11-12 12-3 13-5 13-5 13-5 13-7 13-8 13-10 A-5 A-7) A-8 A-10
Exhibit 10-19 Exhibit 11-1 Exhibit 11-2 Exhibit 11-3 Exhibit 11-3 Exhibit 11-4 Exhibit 12-1 Exhibit 13-1 Exhibit 13-2 Exhibit 13-3 Exhibit 13-4 Exhibit 13-5 Exhibit 13-6 Exhibit 13-6 Exhibit 13-6 Exhibit A-1 Exhibit A-2 Exhibit A-3 Exhibit A-4 Exhibit C-1	Impact of Alternative Discount Rates on Transit Investment Estimates by Scenario GHG Emissions CO ₂ Emissions per Passenger Mile Traveled CO ₂ Emissions per Passenger Mile Traveled for Selected U.S. Heavy Rail Systems Summary of Other Sustainability Strategies Portion of Gulf Coast Region Highways That Are Vulnerable to Relative Sea Level Rise Passenger Fatality Rate per 100 Million Passenger Miles, 2002–2008 Passenger Injury Rate per 100 Million Passenger Miles, 2002–2008 Distribution of Expenditures in Location-Efficient and Auto-Dependent Environments Economic Benefits of Location Efficiency Change in Patterns of Land Use in Cuyahoga County, Ohio, 1948 and 2002 Potential Livability Performance Measures Social Marginal Cost per Metric Ton of CO ₂ Emission Estimates, in Constant 2008 Dollars Types of Operations Strategies Included in Each Scenario Impacts of Operations Strategies in HERS (Highway Economic Requirements System) Typical Costs per Lane Mile Assumed in HERS, by Type of Improvements Definitions of Transit Asset Conditions	10-28 11-6 11-7 11-7 11-12 12-3 13-5 13-5 13-5 13-8 13-8 13-8 13-10 A-5 A-7) A-8 A-10 A-10 C-4