

Introduction

This is the seventh in a series of combined documents prepared by the Department of Transportation to satisfy requirements for reports to Congress on the condition, performance, and future capital investment needs of the Nation's highway and transit systems. This report incorporates highway, bridge, and transit information required by Section 502(h) of Title 23, United States Code (U.S.C.), as well as transit system information required by Section 308(e) of Title 49, U.S.C. Beginning in 1993, the Department combined two separate existing report series that covered highways and transit to form this report series. Prior to this, 11 reports had been issued on the condition and performance of the Nation's highway systems, starting in 1968. Five separate reports on the Nation's transit systems' performance and conditions were issued beginning in 1984.

This *2006 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance* report to Congress (C&P report) draws primarily on 2004 data. The 2004 C&P report, transmitted February 16, 2006, was based primarily on 2002 data.

Report Purpose

This document is intended to provide decision makers with an objective appraisal of the physical conditions, operational performance, and financing mechanisms of highways, bridges, and transit systems based both on the current state of these systems and on the projected future state of these systems under a set of alternative future investment scenarios. This report offers a comprehensive, factual background to support the development and evaluation of legislative, program, and budget options at all levels of government. It also serves as a primary source of information for national and international news media, transportation associations, and industry.

This C&P report consolidates conditions, performance, and financial data provided by States, local governments, and mass transit operators to provide a national-level summary. Some of the underlying data are available through the Department's regular statistical publications. The future investment scenario analyses are developed specifically for this report and provide national-level projections only.

Report Organization

The report begins with a Highlights section that lists key findings, focusing mainly on changes in various indicators since 1997, the last year prior to the enactment of the Transportation Equity Act for the 21st Century (TEA-21), which authorized Federal highway and transit funding for the period 1998 through 2003. This is followed by an Executive Summary that highlights the key findings in each individual chapter. These sections will also be distributed as a separate stand-alone summary document.

The main body of the report is organized into four major sections. Part I, "Description of Current System," and Part II, "Investment/Performance Analysis," include the core analyses of the report. Parts I and II correspond to the first 10 chapters of the 2004 edition. Chapters 2 through 10 begin with a combined summary of highway and transit issues, followed by separate sections discussing highways and transit in more detail. This structure is intended to accommodate report users who want a multimodal perspective, as well as those who may primarily be interested in only one of the two modes.

The core retrospective analyses of the report are contained in the six chapters in Part I.

- **Chapter 1** discusses the role of highways and transit.
- **Chapter 2** describes recent trends in highway, bridge, and transit system characteristics.
- **Chapter 3** depicts the current physical conditions of highways, bridges, and transit systems.
- **Chapter 4** describes the current operational performance of highways and transit systems.
- **Chapter 5** discusses issues relating to the safety performance of highways and transit.
- **Chapter 6** outlines highway and transit revenue sources and expenditure patterns for all levels of government.

The four chapters in Part II contain the core prospective analyses of the report. The Introduction to Part II provides critical background information and caveats that should be considered while interpreting the findings presented in Chapters 7 through 10.

- **Chapter 7** projects future highway, bridge, and transit capital investment under certain defined scenarios.
- **Chapter 8** relates the scenario estimates presented in Chapter 7 to the current levels of capital investment for highways, bridges, and transit presented in Chapter 6.
- **Chapter 9** describes the impacts that past investment has had on the conditions and operational performance of highways, bridges, and transit systems and predicts the impacts that different levels of investment would have.
- **Chapter 10** discusses how the future highway and transit investment scenarios presented in Chapter 7 would be affected by changing the assumptions about travel growth, financing mechanisms, and other key variables.

Part III, “Special Topics,” explores further some topics related to the primary analyses in the earlier sections of the report. Some of these chapters reflect recurring themes that have been discussed in previous editions of the C&P report, while others address new topics of particular interest that will be included in this edition only.

- **Chapter 11** discusses the current condition and performance of the Interstate system and projects the future state of this system under alternative future investment scenarios.
- **Chapter 12** provides comparable information for the National Highway System (NHS).
- **Chapter 13** highlights several innovative finance techniques and strategies that are specifically designed to supplement the traditional highway and transit financing sources identified in Chapter 6.
- **Chapter 14** discusses the role of freight transportation and identifies investment/performance issues specific to the freight area.
- **Chapter 15** discusses the potential for operations strategies to address the congestion problems identified in Chapter 4.

Part IV, “Afterword: A View to the Future,” identifies potential areas for improvement in the data and analytical tools used to produce the analyses contained in this report, and describes ongoing research activities.

The report also contains three technical appendices that describe the investment/performance methodologies used in the report for highways, bridges, and transit.

In assessing recent trends, different parts of this report focus on different time intervals; for example, the Highlights section generally compares 2004 statistics with those for 1997, the last year preceding the 6 years for which Federal highway and transit funding was authorized by the Transportation Equity Act for the 21st Century (TEA-21). The Summary sections at the beginning of Chapters 2 through 8 compare 2004 statistics with those for 2002 presented in the last edition of the C&P report. Within the main body of the chapters, many exhibits present statistics for the primary data year reflected in the last five C&P reports (1995, 1997, 2000, 2002, 2004). Other exhibits cover a longer period of time, depending on data availability and years of significance for particular data series. The choice of years for particular comparisons is intended to highlight interesting trends, rather than to manipulate the appearance of any particular indicator in a positive or negative way.

Highway Data Sources

Highway conditions and performance data are derived from the Highway Performance Monitoring System (HPMS), a cooperative data/analytical effort dating from the late-1970s that involves the Federal Highway Administration (FHWA) and State and local governments. The HPMS includes a statistically drawn sample of over 100,000 highway sections containing data on current physical and operating characteristics, as well as projections of future travel growth on a section-by-section basis. All HPMS data are provided to FHWA through State departments of transportation from existing State or local government databases or transportation plans and programs, including those of metropolitan planning organizations (MPOs).

The HPMS data are collected in accordance with the *Highway Performance Monitoring System Field Manual for the Continuing Analytical and Statistical Data Base*. This document is designed to create a uniform and consistent database by providing standardized collection, coding, and reporting instructions for the various data items. The FHWA reviews the State-reported HPMS data for completeness, consistency, and adherence to reporting guidelines. Where necessary, and with close State cooperation, data may be adjusted to improve uniformity. The HPMS data also serve as a critical input to other studies that are cited in various parts of this report, such as the Texas Transportation Institute’s *2005 Urban Mobility Report* and a 2005 report commissioned by the FHWA, *An Initial Assessment of Freight Bottlenecks on Highways*.

State and local finance data are derived from the financial reports provided by the States to FHWA in accordance with *A Guide to Reporting Highway Statistics*. These are the same data used in compiling the annual *Highway Statistics* report. The FHWA adjusts these data to improve completeness, consistency, and uniformity. Highway safety performance data are drawn from the Fatality Analysis Reporting System (FARS).

Bridge Data Sources

Bridge inventory and inspection data are obtained from the National Bridge Inventory (NBI) collected annually by the FHWA. The NBI contains information from all bridges covered by the National Bridge Inspection Standards (23 CFR 650) located on public roads throughout the United States and Puerto Rico. For each bridge, inventory information is collected documenting the descriptive identification data, functional characteristics, structural design types and materials, location, age and service, geometric characteristics, navigation data, and functional classifications. Conditions information is recorded documenting the inspectors' evaluations of the primary components of a bridge, such as the deck, superstructure, and substructure. In general, bridges are inspected once every two years, although bridges with higher risks are inspected more frequently and certain low-risk bridges are inspected less frequently. The inspection frequency and last inspection date are recorded within the database. The archival NBI data sets represent the most comprehensive uniform source of information available on the conditions and performance of bridges located on public roads throughout the United States.

Transit Data Sources

Transit data are derived from the National Transit Database (NTD). (This information was formerly known as Section 15 data.) The NTD includes detailed summaries of financial and operating information provided to the Federal Transit Administration (FTA) by the Nation's transit agencies. The NTD provides information needed for planning public transportation services and investment strategies. The information from the NTD on transit fleets and facilities is supplemented with information collected directly from transit operators in order to provide a more complete picture of the Nation's total transit infrastructure.

Other Data Sources

Other data sources are also used in the special topics and supplemental analyses sections of the report. For example, the Nationwide Household Travel Survey (NHTS) provides information on the characteristics, volume, and proportion of passenger travel across all modes of transportation. Transit user characteristics and system benefits are based on customer survey statistics collected by the Transit Performance Monitoring System (TPMS). Information on freight activity is collected by the Census Bureau through the Commodity Flow Survey (CFS) and the Vehicle Inventory and Use Survey (VIUS) and merged with other data in FHWA's Freight Analysis Framework (FAF).

Investment/Performance Analytical Procedures

The earliest versions of the reports in this combined series relied exclusively on engineering-based estimates for future investment/performance analysis, which considered only the costs of transportation agencies. This philosophy failed to adequately consider another critical dimension of transportation programs: the impacts of transportation investments on the costs incurred by the users of the transportation system. Executive Order 12893, *Principles for Federal Infrastructure Investments*, dated January 1994, directs each executive department and agency with infrastructure responsibilities to base investments on "...systematic analysis of expected benefits and costs, including both quantitative and qualitative measures..." To address the deficiencies in earlier versions of this report and to meet the challenge of this executive order, new analysis approaches have been developed. The analytical tools now used in this report have added an economic

overlay to the development of future investment scenarios. These newer tools use benefit-cost analysis to minimize the combination of capital investment and user costs to achieve different levels of highway performance.

The highway investment scenarios presented in this report are developed in part from the Highway Economic Requirements System (HERS), which uses marginal benefit-cost analysis to optimize highway investment. The HERS model quantifies user, agency, and societal costs for various types and combinations of improvements, including travel time, vehicle operating, safety, capital, maintenance, and emissions costs.

Bridge investment scenario estimates were developed from the National Bridge Investment Analysis System (NBIAS) model, which was used for the first time in the 2002 edition of the C&P report. Unlike previous bridge models (and similar to HERS), NBIAS incorporates benefit-cost analysis into the bridge investment/performance evaluation.

The transit investment analysis is based on the Transit Economic Requirements Model (TERM). The TERM consolidates older engineering-based evaluation tools and introduces a benefit/cost analysis to ensure that investment benefits exceed investment costs. Specifically, TERM identifies the investments needed to replace and rehabilitate existing assets, improve operating performance, and expand transit systems to address the growth in travel demand and then evaluates these needs in order to select future investments.

While HERS, NBIAS, and TERM all utilize benefit-cost analysis, their methods for implementing this analysis are very different. The highway, transit, and bridge models build off separate databases that are very different from one another. Each model makes use of the specific data available for its part of the transportation system and addresses issues unique to each mode. These three models have not yet evolved to the point where direct multimodal analysis would be possible. For example, HERS assumes that when lanes are added to a highway, this causes highway user costs to fall, resulting in additional highway travel. Some of this would be newly generated travel; some would be the result of travel shifting from transit to highways. However, HERS does not distinguish between these different sources of additional highway travel. At present, there is no direct way to analyze the impact that a given level of highway investment would have on the future performance of transit systems. Likewise, TERM's benefit-cost analysis assumes that some travel shifts from automobile to transit as a result of transit investments, but there is no linkage to the impact on highways.

In interpreting the findings of this report, it is important to recognize the limitations of these analytical tools and the potential impacts of different assumptions that have been made as part of the analysis. The Introduction to Part II and the Part IV, "Afterword: A View to the Future," section both contain information that is critical to putting the future investment scenarios into their proper context. Such issues are also discussed in Q&A boxes located in Chapters 7 through 10. Immediately following this Introduction is the "Highlights" section, which summarizes a few of the most critical caveats on the analysis.

