

Introduction

This is the sixth 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 requirements of the Nation's highway and transit systems. This report incorporates highway and bridge information required by Section 502(g) 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 existing report series that covered highways and transit separately 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 *2004 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance* report to Congress (C&P report) draws primarily on 2002 data. The 2002 C&P report, transmitted January 16, 2003, was based on 2000 data.

Report Purpose

This document is intended to provide Congress and other decision makers with an objective appraisal of the physical conditions, operational performance, financing mechanisms, and future investment requirements of highways, bridges, and transit systems. 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 report consolidates conditions, performance, and finance 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 requirements analyses are developed specifically for this report and provide national-level projections only.

Report Organization

The report begins with an Executive Summary section that highlights the key findings in each chapter. This section will also be distributed as a separate stand-alone summary document.

The main body of the report is organized into five 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 2002 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 both report users who want a multimodal perspective, as well as those who may primarily be interested in only one of the two modes.

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

- **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 comprise the core prospective analyses of the report.

- **Chapter 7** projects future highway, bridge, and transit capital investment requirements under certain defined scenarios.
- **Chapter 8** compares current levels of capital investment for highways, bridges, and transit with projected future investment requirements.
- **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 projections of future highway and transit investment requirements would be affected by changing the assumptions about travel growth 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** describes several current Federal safety initiatives and how they address the safety issues introduced in Chapter 5.
- **Chapter 12** discusses the potential for operations strategies to address the congestion problems identified in Chapter 4.
- **Chapter 13** discusses the role of freight transportation and identifies future investment requirements specific to the freight area.
- **Chapter 14** illustrates the importance of transit by exploring user characteristics and transit benefits.
- **Chapter 15** provides additional statistics relating to the conditions and performance of the Nation’s bridges, along with a discussion of the Federal bridge programs.

Part IV, “Supplemental Analyses of System Components,” builds on the analyses developed in Chapters 2 through 10 by focusing more closely on particular components of the Nation’s highway and transit systems.

- **Chapter 16** discusses the conditions, performance, and future investment requirements for the Interstate System.
- **Chapter 17** provides comparable information for the National Highway System (NHS).
- **Chapter 18** describes current conditions on the Strategic Highway Network (STRAHNET).
- **Chapter 19** analyses the costs and benefits of investments in rail grade crossings.
- **Chapter 20** assesses transit systems on Federal lands.

Part V, “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, as well as describing 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.

Highway Data Sources

Highway condition 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.

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.

Bridge Data Sources

Bridge inventory and inspection data are obtained from the National Bridge Inventory (NBI) collected annually by the Federal Highway Administration. 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' evaluation 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 datasets 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 program provides information needed for planning public transportation services and investment strategies. By supplementing this information on transit facilities and fleets with additional information collected directly from transit operators, we are able to provide a more complete picture of the Nation's transit facilities and equipment in this report.

Other Data Sources

Other data sources are also used in the special topics and supplemental analyses sections of the report. For example, some highway safety performance data are drawn from the Fatality Analysis Reporting System (FARS). The Nationwide Household Travel Survey (NHTS) provides general information on transportation system users and the nature of their trips. 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 Requirement Analytical Procedures

The earliest versions of the reports in this combined series relied exclusively on engineering-based estimates for future investment requirements, 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 projection of future investment requirements. 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 requirements 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 requirements 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 requirement 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 transit investment requirements (or vice versa).

It is important to recognize that, in reality, highway, bridge, and transit investments are not made optimally to achieve maximum benefit-cost results. Consequently, the HERS, NBIAS, or TERM models may understate the actual level of investment that would be needed to achieve a particular level of performance. Note, however, that other factors may cause the models to overestimate investment requirements. For example, the highway investment requirements analysis does not account for demand management options, such as congestion pricing. If widely adopted, such strategies would improve the operating efficiency of the highway system, reducing the level of investment required to achieve a particular level of performance below the level that would be estimated by HERS.