



# Research Digest

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## *Item 1*

### **ACRP First Annual Report of Progress 2006**

*TRANSPORTATION RESEARCH BOARD*

*ACRP Report of Progress 2006 • 2007*

TRB's Airport Cooperative Research Program (ACRP) has released its first annual report. The report provides background and an overview of the program and includes a status report on each of ACRP's projects.

Full-text PDF of this report is available for free download from

<http://www.trb.org/NotesDocs/ACRPAnnual2006.pdf>

## *Item 2*

### **Innovative Finance and Alternative Sources of Revenue for Airports**

*TRANSPORTATION RESEARCH BOARD*

*ACRP Synthesis 1 • 2007*

Airport administrators, engineers, and researchers often face problems for which information already exists, either in documented form or as undocumented experience and practice. This information may be fragmented, scattered, and unevaluated. As a consequence, full knowledge of what has been learned about a problem may not be brought to bear on its solution. Costly research findings may go unused, valuable experience may be overlooked, and due consideration may not be given to recommended practices for solving or alleviating the problem.

There is information on nearly every subject of concern to the airport industry. Much of it derives from research or from the work of practitioners faced with problems in their day-to-day work. To provide a systematic means for assembling and evaluating such useful information and to make it available to the entire airport community, the Airport Cooperative Research Program authorized the Transportation Research Board to undertake a continuing project. This project, ACRP Project 11-03, "Synthesis of Information Related to Airport Practices," searches out and synthesizes useful knowledge from all available sources and prepares concise, documented reports on specific topics. Reports from this endeavor constitute an ACRP report series, Synthesis of Airport Practice.

This synthesis series reports on current knowledge and practice, in a compact format, without the detailed directions usually found in handbooks or design manuals. Each report in the series provides a compendium of the best knowledge available on those measures found to be the most successful in resolving specific problems.

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## **Item 3**

### **Airport Aviation Activity Forecasting**

*TRANSPORTATION RESEARCH BOARD*

*ACRP Synthesis 2 • 2007*

TRB's Airport Cooperative Research Program (ACRP) Synthesis 2: Airport Aviation Activity Forecasting examines how airport forecasts are used and identifies common aviation metrics, aviation data sources, issues in data collection and preparation, and special data issues at nontowered airports. The report also explores available forecasting methods, including the primary statistical methods; market share analysis; econometric modeling; and time series modeling. In addition the report reviews forecast uncertainty, accuracy, issues of optimism bias, and options for resolving differences when multiple forecast are available.

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## **Item 4**

### **Impact of Behavior-Based Safety Techniques on Commercial Motor Vehicle Drivers**

*TRANSPORTATION RESEARCH BOARD*

*CTBSSP Synthesis 11 • 2007*

This synthesis will be useful to federal and state agencies, commercial truck and bus operators, and others interested in improving commercial vehicle safety. The synthesis identifies and describes various strategies to increase safety-related driving behaviors, and decrease at-risk driving behaviors, of commercial motor vehicle drivers. It includes an extensive literature review and case study information on innovative and successful behavior-based safety practices in commercial vehicle settings. The synthesis also includes the results of a survey of motor carrier safety managers that provides information on current behavioral safety management practices in commercial motor vehicle operations and their effectiveness.

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## **Item 5**

### **Commercial Motor Vehicle Carrier Safety Management Certification**

*TRANSPORTATION RESEARCH BOARD*

*CTBSSP Synthesis 12 • 2007*

This synthesis will be useful to federal and state agencies, commercial truck and bus operators, and others interested in improving commercial vehicle safety. The synthesis documents current information on existing commercial motor vehicle safety certification, selfevaluation, benchmarking, and best practices programs; identifies major common elements and protocols; and critically assesses evidence for the crash-reduction effectiveness of the programs. It includes a survey of truck carriers and other applicable industries and relevant organizations for their experiences. A literature review and case studies of innovative and successful practices are also included.

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## ***Item 6***

### **Critical Issues in Transportation**

*TRANSPORTATION RESEARCH BOARD*

*MS 7985 • 2006*

TRB's Executive Committee periodically identifies a set of critical issues in transportation to focus attention on the most significant transportation issue facing the country and on the areas most in need of innovation. Meeting the challenges posed by these issues—congestion, emergencies, energy and environment, equity, finance, human and intellectual capital, infrastructure, institutions, and safety—will require new ideas and creativity in the years ahead.

Full-text PDF of this report is available for free download from

<http://trb.org/publications/general/CriticalIssues06.pdf>

## ***Item 7***

### **Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) Standards (2006)**

*TRANSPORTATION RESEARCH BOARD*

*MS 7986 • 2006*

Since CAFE standards were established 25 years ago, there have been significant changes in motor vehicle technology, globalization of the industry, the mix and characteristics of vehicle sales, production capacity, and other factors. This volume evaluates the implications of these changes as well as changes anticipated in the next few years, on the need for CAFE, as well as the stringency and/or structure of the CAFE program in future years.

Full-text PDF of this report is available for free download from

[http://www.nap.edu/catalog.php?record\\_id=10172](http://www.nap.edu/catalog.php?record_id=10172)

## ***Item 8***

### **Guidebook for Freight Policy, Planning, and Programming in Small- and Medium-Sized Metropolitan Areas**

*TRANSPORTATION RESEARCH BOARD*

*NCHRP Report 570 • 2007*

TRB's National Cooperative Highway Research Program (NCHRP) Report 570: Guidebook for Freight Policy, Planning, and Programming in Small- and Medium-Sized Metropolitan Areas explores how freight policy, planning, and programming processes can be most effectively designed, initiated, and managed in metropolitan areas of these sizes. The report examines lessons learned from experiences in small- and medium-sized metropolitan areas that resulted in more effective consideration of freight issues in policy, planning, and programming decisions.

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## ***Item 9***

### **Roundabouts in the United States**

*TRANSPORTATION RESEARCH BOARD*

*NCHRP Report 572 • 2007*

TRB's National Cooperative Highway Research Program (NCHRP) Report 572: Roundabouts in the United States explores methods of estimating the safety and operational impacts of roundabouts and examines updated design criteria for roundabouts. Also available are appendixes to the report, published as NCHRP Web-Only Document 94, which includes detailed reviews of the literature on safety performance and operational models, the master inventory of U.S. roundabouts assembled for this project, and the results of the statistical testing of various models.

Full-text PDF of this report is available for free download from

[http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp\\_rpt\\_572.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_572.pdf)

## ***Item 10***

### **Guidance for Cost Estimation and Management for Highway Projects During Planning, Programming, and Construction**

*TRANSPORTATION RESEARCH BOARD*

*NCHRP Report 574 • 2007*

This guidebook presents approaches to cost estimation and management to overcome the root causes of cost escalation and to support the development of consistent and accurate project estimates through all phases of the development process, from long-range planning, through priority programming, and through project design.

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## ***Item 11***

### **TransXML: XML Schemas for Exchange of Transportation Data**

*TRANSPORTATION RESEARCH BOARD*

*NCHRP Report 576 • 2007*

This report develops a proposed common framework for exchange of transportation data in eXtensible Markup Language, known as TransXML. This framework can be used for developing, validating, disseminating, and extending current and future schemas. The research team conducted an extensive review of current XML efforts in the transportation sector, identified specific gaps and opportunities, and developed a plan to address the highest priority needs. The team developed a number of pilot schemas and applications, as well as recommendations for tools and platforms that can simplify XML coding for other transportation applications. The report summarizes the benefits that can be achieved by the adoption and expansion of TransXML, and outlines future efforts that will be needed to ensure its success.

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## **Item 12**

### **Continuing Project to Synthesize Information on Highway Problems**

*TRANSPORTATION RESEARCH BOARD*

*NCHRP Research Results Digest 309 • 2007*

A staff digest of the progress and status of NCHRP Project 20-5, “Synthesis of Information Related to Highway Problems,” for which the Transportation Research Board is the agency conducting the research. Individual studies for the project are managed by Jon Williams, Manager, Synthesis Studies, Donna L. Vlasak, Senior Program Officer, and Gail Staba, Senior Program Officer, serving under the Studies and Special Programs Division of the Board, Stephen R. Godwin, Director.

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## **Item 13**

### **Guide to Effective Freeway Performance Measurement**

*TRANSPORTATION RESEARCH BOARD*

*NCHRP Research Results Digest 312 • 2007*

Freeway performance measurement uses statistical information to determine if a highway system is meeting the objectives of effectively serving the traveling public. Most state transportation agencies set such objectives and collect data on traffic and related aspects of freeway operations to assess performance. However, there are other possible users of freeway performance measures, such as metropolitan planning organizations (MPOs), freight carriers, public-transportation administrators, and emergency-services operators, and other aspects of performance than observations of traffic that are important to freeway managers and the public. No single organized framework or comprehensive set of measures for freeway performance assessment has gained widespread acceptance to serve the needs of the full range of potential users of performance information.

The objective of NCHRP Project 3-68, “Guide to Effective Freeway Performance Measurement,” was to develop a guide on the effective use of freeway performance measures in operating a freeway system and in meeting the information needs of a large spectrum of potential local, regional, and national users. This digest describes the framework for performance measurement that was developed. The Guidebook itself, presenting detailed, step-by-step procedures for measurement and reporting of freeway performance, is available as part of NCHRP Web- Only Document 97 and may be accessed from the TRB website ([www.TRB.org](http://www.TRB.org)) where readers should search on the title of the publication. The study emphasized congestion and mobility but considered safety, operational efficiency, ride quality, environmental factors, and customer satisfaction as well.

The guide was designed to answer four primary questions: (1) what measures should be used to characterize freeway performance; (2) how can these measures be developed with available data and models; (3) how should freeway performance information be communicated to users of that information; and (4) how can freeway performance measures be used in decision making. The guide is written to address primarily the interests of state departments of transportation (DOTs) and MPOs; the latter are responsible for bringing together the interests of local governments in their areas and the state to coordinate transportation system development and management.

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## ***Item 14***

### **Cost-Allocation Methods for Commuter, Intercity, and Freight Rail Operations on Shared-Use Rail Systems and Corridors**

*TRANSPORTATION RESEARCH BOARD*

*NCHRP Research Results Digest 313 • 2007*

This digest will be valuable to states and local public transportation agencies that are planning to initiate commuter rail or intercity passenger rail service within a shared-use corridor in the near future. The digest summarizes current shared-use rail arrangements; highlights both the allocation of operating and maintenance costs and the arrangements for making infrastructure improvements; identifies the cost-allocation methodologies, capital investment strategies, and other associated issues that warrant additional analysis and refinement; identifies opportunities for potential outreach and buy-in efforts among system stakeholders; and identifies future research topics that can highlight key issues and cover a broad spectrum of ownership configuration, geography, service speeds and density, and infrastructure improvement programs.

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## ***Item 15***

### **Prototype Software For An Environmental Information Management and Decision Support System**

*TRANSPORTATION RESEARCH BOARD*

*NCHRP Research Results Digest 317 • 2007*

Protecting and enhancing environmental quality while managing the transportation systems of a large area such as a state or metropolitan region present a variety of substantial challenges. These challenges are posed not only by the fundamental complexity of the physical, biological, and social processes that influence the environmental consequences of transportation system management decisions, but also by the substantial amounts of information that must be collected, maintained, and used to analyze environmental impact and to report on the analyses for decision making. Professionals engaged with such matters have come to realize that an environmental information management system (EIMS) is a valuable and often essential tool for agencies working to meet these challenges.

This digest describes the results of NCHRP Project 25-23, a multiyear research effort to design, test, and demonstrate a prototype software program for an EIMS that state departments of transportation (DOTs) and others could use to support their environmental decision making throughout the transportation system management process, from long-range planning through project development, construction, operations, and maintenance. The EIMS is intended to serve as one component of an agency's broader environmental management system (EMS).

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## **Item 16**

### **Estimating Toll Road Demand and Revenue**

*TRANSPORTATION RESEARCH BOARD*

*NCHRP Synthesis 364 • 2007*

This synthesis reports on the state of the practice for forecasting demand and revenues for toll roads in the United States. The synthesis focused on the models that are used to forecast the demand for travel. It also considered the application of these models to project revenues as a function of demand estimates. Goals included: developing a profile of the current state of the practice in toll road demand forecasting; identifying technical modeling issues that affect the accuracy, effectiveness, and reliability of the forecasts; and making recommendations for research to improve the state of the practice. The report is intended to serve as a resource for state departments of transportation (DOTs), metropolitan planning organizations, tolling authorities and operators, potential investors, bond rating agencies, and consultants who prepare models and forecasts on behalf of DOTs and other toll facility owners.

A survey was distributed to various state DOTs, toll authorities, bond rating agencies, and bond insurance agencies in the United States. A literature search was undertaken to identify relevant research reports, papers, and other publications for review.

David Kriger, Suzette Shiu, and Sasha Naylor, iTRANS Consulting, Richmond Hill, ON, Canada, collected and synthesized the information and wrote the report. The members of the topic panel are acknowledged on the preceding page. This synthesis is an immediately useful document that records the practices that were acceptable within the limitations of the knowledge available at the time of its preparation. As progress in research and practice continues, new knowledge will be added to that now at hand.

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## **Item 17**

### **Preserving and Using Institutional Memory Through Knowledge and Practices : A Synthesis of Highway Practice**

*TRANSPORTATION RESEARCH BOARD*

*NCHRP Synthesis 365 • 2007*

TRB's National Cooperative Highway Research Program (NCHRP) Synthesis 365: Preserving and Using Institutional Memory through Knowledge Management Practices explores practices regarding the preservation and use of institutional memory through the knowledge management practices of United States and Canadian transportation agencies. The report examines practices for the effective organization, management, and transmission of materials, knowledge, and resources that are in the unique possession of individual offices and employees.

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## ***Item 18***

### **Coordinated Approaches to Expanding Access to Public Transportation**

*TRANSPORTATION RESEARCH BOARD*

*TCRP Research Results Digest 81 • 2007*

The following digest is an overview of the mission that investigated coordinated approaches to expanding access to public transportation in the United Kingdom, the Netherlands, Sweden, and France. It is based on individual reports provided by the team members (for a team roster, see Appendix A), and it reflects the observations of the team members, who are responsible for the facts and accuracy of the data presented. The digest does not necessarily reflect the views of TCRP, TRB, the National Academies, APTA, FTA, or the Eno Transportation Foundation.

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## ***Item 19***

### **Use of Guard/Girder/Restraining Rails**

*TRANSPORTATION RESEARCH BOARD*

*TCRP Research Results Digest 82 • 2007*

Preliminary guidelines are provided herein for the application of guard/girder/restraining rails by transit systems in order to improve vehicle curving performance, to reduce risk of flange climb derailment, and to control wheel/rail wear. These guidelines were derived from an investigation of the effects of three-dimensional wheel/guard/girder/restraining rail contact geometry and guard/girder/restraining rail installation parameters--including flangeway width and height, lubrication, track curvatures, track gage, and vehicle types on the wheel/rail forces and wear--through NUCARS® simulations.

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