



TRANSPORTATION RESEARCH BOARD

## Maintenance and Preservation Overview

### TRB at a Glance

The mission of the Transportation Research Board (TRB) is to provide leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal.

A resource to the nation and to the transportation community worldwide, TRB provides an extensive portfolio of services:

- Opportunities for information exchange on current transportation research and practice,
- Management of cooperative research and other research programs,
- Analyses of national transportation policy issues and guidance on federal and other research programs
- Publications and access to research information from around the world.

More info at [www.trb.org](http://www.trb.org)

### TRB's Transportation Research Information Services (TRIS)

**TRIS includes the TRB Library and the TRIS Databases (listed below) which are available for free on TRB's website.**

**The TRB Library provides information services to TRB staff, sponsors, TRB Committee members and panels and researchers. Access to the TRB Library is a benefit to TRB sponsors and TRB committee members.**

In cooperation with your State DOT Library or Information Service, the TRB Library provides:

- Reference and research assistance
- Literature searches
- Articles for TRB Committee work

**The TRB Library provides training on effective and efficient use of the following TRIS resources:**

**TRID** – The world's largest and most comprehensive bibliographic source on all modes and disciplines of transportation  
[trid.trb.org](http://trid.trb.org)

**Practice Ready Papers (PRP) Database** - Papers with information that is ready for immediate implementation or requires minimal additional research or implementation effort.  
[prp.trb.org](http://prp.trb.org)

**Publications Index (PubsIndex) Database** – The papers, articles and reports published by the Transportation Research Board, Highway Research Board, Strategic Highway Research Programs or the Marine Board  
[pubsindex.trb.org](http://pubsindex.trb.org)

**Research in Progress (RiP) Database** – Current or recently completed transportation research projects  
[rip.trb.org](http://rip.trb.org)

**Research Needs Statements (RNS)** – Research needs as identified by TRB Technical Activities standing committees  
[rns.trb.org](http://rns.trb.org)

More information about TRIS is available online at: <http://www.trb.org/InformationServices/InformationServices.aspx>  
Contact the Library at [TRBLibrary@nas.edu](mailto:TRBLibrary@nas.edu) or 1 (202) 334-2989

### Upcoming Events

- Conferences:
  - April 25, 2016 - Fort Collins, Colorado **2016 International Conference on Winter Maintenance and**



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**Surface Transportation Weather**

- June 26, 2016 - Foz do Iguacu, Brazil **8th International Conference on Bridge Maintenance, Safety and Management (IABMAS2016)**
- July 15, 2017 - Sharm ElSheikh, Egypt **GeoMEast International Conference: "Innovative Infrastructure Geotechnology"**
- July 16, 2016 - Xi'an, China **International Conference on Transportation Infrastructure and Materials**
- July 25, 2016 - Shandong, China **GeoChina 2016 International Conference**
- August 14, 2016 - Portland, Oregon **Use of Scenario Planning in Transportation Planning**

• Webinars:

- March 9, 2016 **Lessons Learned from 10 Years+ of Using Full-Depth Reclamation for Road Rehabilitation**

View TRB webinars here: <http://www.trb.org/ElectronicSessions/ConferenceRecordings.aspx>

**Technical Committees**

• Standing Committees:

- Pavement Management Systems (AFD10)
- Pavement Monitoring and Evaluation (AFD20)
- Pavement Rehabilitation (AFD70)
- Field Testing and Nondestructive Evaluation (NDE) of Transportation Structures (AFF40)
- Flexible Pavement Construction and Rehabilitation (AFH60)
- Seasonal Climatic Effects on Transportation Infrastructure (AFP50)
- Operations and Preservation Group (AH000)
- Surface Transportation Weather (AH010)
- Work Zone Traffic Control (AHB55)
- Section - Maintenance and Preservation (AHD00)
- Maintenance and Operations Management (AHD10)
- Maintenance and Operations Personnel (AHD15)
- Pavement Preservation (AHD18)
- Pavement Maintenance (AHD20)
- Sealants and Fillers for Joints and Cracks (AHD25)
- Structures Maintenance (AHD30)
- Bridge Management (AHD35)
- Bridge Preservation (AHD37)
- Polymer Concretes, Adhesives, and Sealers (AHD40)
- Corrosion (AHD45)
- Roadside Maintenance Operations (AHD50)
- Signing and Marking Materials (AHD55)
- Maintenance Equipment (AHD60)
- Winter Maintenance (AHD65)
- Railway Maintenance (AR060)

• Policy Study Committees:

- TRB Long-Term Pavement Performance (LTPP) Committee (B0135)
- Expert Task Group on LTPP Special Activities (E1002-B)

• Council:

- Young Member Council (A0040T)

To become Friend of any committee visit [MyTRB.org](http://MyTRB.org)



## Cooperative Research Program (CRP)

- NCHRP Reports
  - NCHRP Report, Issue: 810 - Consideration of Preservation in Pavement Design and Analysis Procedures.
  - NCHRP Report, Issue: 793 - Incorporating Transportation Security Awareness into Routine State DOT Operations and Training.
  - NCHRP Report, Issue: 784 - Best Practices for Crack Treatments for Asphalt Pavements.
  - NCHRP Report, Issue: 782 - Proposed Guideline for Reliability-Based Bridge Inspection Practices.
  - NCHRP Report, Issue: 759 - Effective Removal of Pavement Markings.
  - NCHRP Report, Issue: 753 - A Pre-Event Recovery Planning Guide for Transportation.
  - NCHRP Report, Issue: 751 - Renewable Energy Guide for Highway Maintenance Facilities.
  - NCHRP Report, Issue: 746 - Traffic Enforcement Strategies for Work Zones.
  - NCHRP Report, Issue: 742 - Communicating the Value of Preservation: A Playbook.
  - NCHRP Report, Issue: 736 - Resource Allocation Logic Framework to Meet Highway Asset Preservation.
  - NCHRP Report, Issue: 726 - A Guidebook for Nighttime Construction: Impacts on Safety, Quality, and Productivity.
  - NCHRP Report, Issue: 711 - Guidance for the Selection, Use, and Maintenance of Cable Barrier Systems.
  - NCHRP Report, Issue: 692 - Decision Making for Outsourcing and Privatization of Vehicle and Equipment Fleet Maintenance.
  - NCHRP Report, Issue: 688 - Determining Highway Maintenance Costs.
  - NCHRP Report, Issue: 680 - Manual for Emulsion-Based Chip Seals for Pavement Preservation.
- NCHRP Synthesis of Highway Practice
  - NCHRP Synthesis of Highway Practice, Issue: 474 - Service Life of Culverts.
  - NCHRP Synthesis of Highway Practice, Issue: 473 - Indefinite Delivery/Indefinite Quantity Contracting Practices.
  - NCHRP Synthesis of Highway Practice, Issue: 472 - FEMA and FHWA Emergency Relief Funds Reimbursements to State Departments of Transportation.
  - NCHRP Synthesis of Highway Practice, Issue: 471 - Practices for Developing Transparent Best Value Selection Procedures.
  - NCHRP Synthesis of Highway Practice, Issue: 470 - Maintenance Quality Assurance Field Inspection Practices.
  - NCHRP Synthesis of Highway Practice, Issue: 469 - Impacts of Energy Developments on U.S. Roads and Bridges.
  - NCHRP Synthesis of Highway Practice, Issue: 468 - Interactive Training for All-Hazards Emergency Planning, Preparation, and Response for Maintenance and Operations Field Personnel.
  - NCHRP Synthesis of Highway Practice, Issue: 464 - Thin Asphalt Concrete Overlays.
  - NCHRP Synthesis of Highway Practice, Issue: 463 - Pavement Patching Practices.
  - NCHRP Synthesis of Highway Practice, Issue: 454 - Response to Extreme Weather Impacts on Transportation Systems.
  - NCHRP Synthesis of Highway Practice, Issue: 449 - Strategies to Mitigate the Impacts of Chloride Roadway Deicers on the Natural Environment.
  - NCHRP Synthesis of Highway Practice, Issue: 439 - Use of Transportation Asset Management Principles in State Highway Agencies.
  - NCHRP Synthesis of Highway Practice, Issue: 431 - Practices to Manage Traffic Sign Retroreflectivity.
  - NCHRP Synthesis of Highway Practice, Issue: 430 - Cost-Effective and Sustainable Road Slope Stabilization and Erosion Control.
  - NCHRP Synthesis of Highway Practice, Issue: 426 - Performance-Based Highway Maintenance and Operations Management.
  - NCHRP Synthesis of Highway Practice, Issue: 423 - Long-Term Performance of Polymer Concrete for Bridge Decks.
- NCHRP – IDEA Program
  - NCHRP-IDEA Program Project Final Report - Investigation of a Full-Lane Acoustic Scanning Method for

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- Bridge Deck Nondestructive Evaluation.
- NCHRP-IDEA Program Project Final Report - Long-Term Remote Sensing System for Bridge Piers and Abutments.
- NCHRP-IDEA Program Project Final Report - Advanced Methods for Mobile Retroreflectivity Measurement of Pavement Marking.
- NCHRP-IDEA Program Project Final Report - Cleaning Device to Remove Debris and Chemicals for Crack/Joint Sealing.
- NCHRP-IDEA Program Project Final Report - Development of a Sensing Methodology for Intelligent and Reliable Work-Zone Hazard Awareness.
- NCHRP-IDEA Program Project Final Report - Bridge Cable Inspection with Long Range Ultrasound.
- NCHRP-IDEA Program Project Final Report - Bridge Retrofit Laser System.
- NCHRP-IDEA Program Project Final Report - Corrosion Resistant, Structurally Reinforced, Thermal Spray Coatings for In Situ Repair of Load Bearing Structures.
- NCHRP-IDEA Program Project Final Report - Advanced Cleaning Device to Remove Debris and Chemicals for Crack/Joint Sealing in Pavement.
- NCHRP Research Results Digests
  - NCHRP Research Results Digest, Issue: 387 - Alternative Delivery Methods for Winter Maintenance Operations.
  - NCHRP Research Results Digest, Issue: 365 - Sustainable Pavement Maintenance Practices.
- Transportation Research Circulars
  - Transportation Research Circular, Issue: E-C198 - Moisture Damage to Hot-Mix Asphalt Mixtures. Synopsis of a Workshop, January 22, 2012, Washington, D.C..
  - Transportation Research E-Circular, Issue: E-C163 - Maintenance Management 2012: Presentations from the 2012 AASHTO-TRB Maintenance Management Conference, July 15-19, 2012, Seattle, Washington.
  - Transportation Research E-Circular, Issue: E-C162 - Winter Maintenance and Surface Transportation Weather. International Conference on Winter Maintenance and Surface Transportation Weather, April 30-May 3, 2012, Coralville, Iowa.
- ACRP Reports
  - ACRP Report, Issue: 139 - Optimizing Airport Building Operations and Maintenance Through Retrocommissioning: A Whole-Systems Approach.
  - ACRP Report, Issue: 138 - Preventive Maintenance at General Aviation Airports. Volume 1: Primer.
  - ACRP Report, Issue: 138 - Preventive Maintenance at General Aviation Airports. Volume 2: Guidebook.
  - ACRP Report, Issue: 123 - A Guidebook for Airport Winter Operations.
  - ACRP Report, Issue: 116 - Guidebook for Successfully Assessing and Managing Risks for Airport Capital and Maintenance Projects.
  - ACRP Report, Issue: 110 - Evaluating Impacts of Sustainability Practices on Airport Operations and Maintenance: User's Guide and Research Report.
  - ACRP Report, Issue: 100 - Recycling Best Practices—A Guidebook for Advancing Recycling from Aircraft Cabins.
  - ACRP Report, Issue: 92 - Guidebook to Creating a Collaborative Environment Between Airport Operations and Maintenance.
  - ACRP Report, Issue: 45 - Optimizing the Use of Aircraft Deicing and Anti-Icing Fluids.
- ACRP Synthesis of Airport Practice
  - ACRP Synthesis of Airport Practice, Issue: 67 - Airside Snow Removal Practices for Small Airports with Limited Budgets.
  - ACRP Synthesis of Airport Practice, Issue: 49 - Helping New Maintenance Hires Adapt to the Airport Operating Environment.
  - ACRP Synthesis of Airport Practice, Issue: 47 - Repairing and Maintaining Airport Parking Structures While in Use.
  - ACRP Synthesis of Airport Practice, Issue: 27 - Airport Self-Inspection Practices.

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- ACRP Synthesis of Airport Practice, Issue: 22 - Common Airport Pavement Maintenance Practices.
- TCRP Reports
  - TCRP Report, Issue: 178 - A National Training and Certification Program for Transit Vehicle Maintenance Instructors.
  - TCRP Report, Issue: 172 - Guidance for Developing a Transit Asset Management Plan.
  - TCRP Report, Issue: 170 - Establishing a National Transit Industry Rail Vehicle Technician Qualification Program—Building for Success.
  - TCRP Report, Issue: 157 - State of Good Repair: Prioritizing the Rehabilitation and Replacement of Existing Capital Assets and Evaluating the Implications for Transit.
- TCRP Synthesis of Transit Practice
  - TCRP Synthesis of Transit Practice, Issue: 107 - Rail Transit Track Inspection Practices.
  - TCRP Synthesis of Transit Practice, Issue: 100 - Elevator and Escalator Maintenance and Safety Practices.
- TCRP Web Documents
  - TCRP Web Document, Issue: 65 - Wheel Profile Maintenance Guidelines.
  - TCRP Web Document, Issue: 64 - Performance Based Track Geometry Phase 2.
  - TCRP Web Document, Issue: 52 - Performance-Based Track Geometry, Phase 1.
- Other Reports
  - NCHRP Web Document, Issue: 189 - Design and Management of Historic Roads.
  - NCHRP Legal Research Digest, Issue: 61 - Legal Aspects for Performance-Based Specifications for Highway Construction and Maintenance Contracts.
  - NCFRP Report, Issue: 32 - Integrating MTS Commerce Data with Multimodal Freight Transportation Performance Measures to Support MTS Maintenance Investment Decision Making.
  - Transportation Research Board Special Report, Issue: 315 - Funding and Managing the U.S. Inland Waterways System: What Policy Makers Need to Know.
  - TRANSIT-IDEA Program Project Final Report, Issue: 62 - Development of Electrical Maintenance Training Module for Bus Transit Technicians.
  - Safety IDEA Program Project Final Report - Reducing Wheel Climb at Switch Points to Reduce Derailments.
  - TCRP Research Results Digest, Issue: 101 - Funding for Infrastructure Maintenance: Achieving and Sustaining a State of Good Repair.
  - Long-Term Bridge Performance Committee Letter Report: February 20, 2015.
- Current research
  - ACRP 09-13 - Considering Life Cycle Costs in Airport Asset Procurement
  - ACRP 09-12 - NextGen—Leveraging NextGen Spatial Data to Benefit Airports
  - ACRP 09-11 - Pavement Maintenance Guidelines for General Aviation Airport Management
  - ACRP 09-10 - Benchmarking and Profiling Airport Terminal Energy End Uses
  - ACRP 09-07 - Airport Maintenance Roles in Planning, Design, Construction, Commissioning, and Activation
  - TCRP E-10 - Maintenance Technician Staffing Levels for Modern Public Transit Fleets
  - NCHRP 14-35 - Acceptance Criteria of Complete Joint Penetration Steel Bridge Welds Evaluated Using Enhanced Ultrasonic Methods
  - NCHRP 14-34 - Guide for Performance Measures in Snow and Ice Control Operations
  - NCHRP 14-33 - Pavement Performance Measures that Consider the Contributions of Preservation Treatments



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- NCHRP 14-32 - Proposed Revisions to the AASHTO Movable Bridge Inspection, Evaluation, and Maintenance Manual
- NCHRP 14-31 - Developing a Pavement-Maintenance Database System
- NCHRP 14-30 - Spot Painting to Extend Highway Bridge Coating Life
- NCHRP 14-29 - Assessing, Coding, and Marking of Highway Structures in Emergency Situations
- NCHRP 14-28 - Condition Assessment of Bridge Post-Tensioning and Stay Cable Systems Using NDE Methods
- NCHRP 14-26 - Culvert and Storm Drain System Inspection Manual
- NCHRP 14-20A - Consequences of Delayed Maintenance of Highway Assets
- NCHRP 14-19 - Culvert Rehabilitation to Maximize Service Life While Minimizing Direct Costs and Traffic Disruption
- NCHRP 10-82A - Performance-Related Specifications for Pavement Preservation Treatments
- NCHRP 09-50 - Performance-Related Specifications for Asphaltic Binders Used in Preservation Surface Treatments
- Upcoming projects
  - NCHRP 14-38 - Triggers and Timings for the Placement of Pavement Preservation Treatments for Asphalt Pavements
  - NCHRP 14-37 - Guide Construction Specifications for Pavement Preservation Treatments: Chip Seal and Microsurfacing
  - NCHRP 14-36 - Proposed AASHTO Guide for Bridge Preservation Actions
  - ACRP 09-14 - Advanced Computer Maintenance Management Systems Integration for Airports
  - TCRP E-11 - The Relationship Between Transit Asset Condition and Service Quality

Panel Member nominations accepted (<http://www.trb.org/TCRP/CRPInfoPanelMembers.aspx>)

## Second Strategic Highway Research Program (SHRP 2)

- SHRP 2 Report, Issue: S2-R26-RR-2 - Guidelines for the Preservation of High-Traffic-Volume Roadways.
- SHRP 2 Report, Issue: S2-R26-RR-1 - Preservation Approaches for High-Traffic-Volume Roadways.
- SHRP 2 Report, Issue: S2-R15B-RW-1 - Identification of Utility Conflicts and Solutions.
- SHRP 2 Report, Issue: S2-R06A-RR-1 - Nondestructive Testing to Identify Concrete Bridge Deck Deterioration.
- SHRP 2 Report, Issue: S2-R06D-RW-5. Volume 5 - Nondestructive Testing to Identify Delaminations Between HMA Layers.
- SHRP 2 Report, Issue: S2-R06D-RW-4. Volume 4 - Nondestructive Testing to Identify Delaminations Between HMA Layers.
- SHRP 2 Report, Issue: S2-R06D-RW-3. Volume 3 - Nondestructive Testing to Identify Delaminations Between HMA Layers.
- SHRP 2 Report, Issue: S2-R06D-RW-2. Volume 2 - Nondestructive Testing to Identify Delaminations Between HMA Layers.
- SHRP 2 Report, Issue: S2-R06D-RR-1. Volume 1 - Nondestructive Testing to Identify Delaminations between HMA Layers.
- SHRP 2 Report, Issue: S2-R05-RR-1 - Precast Concrete Pavement Technology.
- SHRP 2 Report, Issue: S2-R10-RW-1 - Project Management Strategies for Complex Projects.
- SHRP 2 Report, Issue: S2-R11-RW-2 - WISE Software Users Guide.
- SHRP 2 Report, Issue: S2-R23-RR-1 - Using Existing Pavement In Place and Achieving Long Life.
- SHRP 2 Report, Issue: S2-R06G-RR-1 - Mapping Voids, Debonding, Delaminations, Moisture, and Other Defects Behind or Within Tunnel Linings.
- SHRP 2 Report, Issue: S2-R07-RR-1 - Performance Specifications for Rapid Highway Renewal.
- SHRP 2 Report, Issue: S2-R19A-RW-1 - Bridges for Service Life Beyond 100 Years: Innovative Systems, Subsystems, and Components.
- SHRP 2 Report, Issue: S2-R06F-RW-1 - Assessment of Continuous Pavement Deflection Measuring Technologies.



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- SHRP 2 Report, Issue: S2-R23-RW-2 - Guide to Using the Existing Pavement in Place and Achieving Long Life.
- SHRP 2 Report, Issue: S2-R10-RW-2 - Guide to Project Management Strategies for Complex Projects.
- SHRP 2 Report, R11 - Strategic Approaches at the Corridor and Network Level to Minimize Disruption from the Renewal Process.
- SHRP 2 Project Brief, Issue: R26 - Preservation Approaches for High-Traffic-Volume Roadways.
- SHRP 2 Project Brief - Pavements for Rapid Renewal: Get In, Get Out, Stay Out.
- SHRP 2 Project Brief - Nondestructive Testing Technologies for Rapid Renewal: Reduce Traffic Disruptions, Improve Efficiency.
- SHRP 2 Project Brief - Meeting the Challenges of Rapid Renewal Projects.
- SHRP 2 Project Brief - Managing Utility Conflicts to Achieve the 3 C's: Communication, Coordination, and Cooperation.

**Other Relevant Reports**

- 2013: Planning, Design, Operations, and Infrastructure (*Journal of the Transportation Research Board, No. 2387*)
- Livable Cities of the Future: Proceedings of a Symposium Honoring the Legacy of George Bugliarello (2014, *National Academy of Engineering*)