

Research Digest

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Item 1

Applying whole effluent toxicity testing to aircraft deicing runoff

TRANSPORTATION RESEARCH BOARD (TRB)

ACRP Report 134 • 2015

"TRB's Airport Cooperative Research Program (ACRP) Report 134: Applying Whole Effluent Toxicity Testing to Aircraft Deicing Runoff describes the unique characteristics of stormwater toxicity testing at airports. It also provides guidance for developing sound whole effluent toxicity (WET) testing programs in an airport setting."--TRB Publications Page
(111 pages)

CONTENTS

- Summary
- Section 1. Introduction and background
- Section 2. Overview of WET testing
- Section 3. Considerations regarding application of whole effluent aquatic toxicity testing to airport stormwater runoff
- Section 4. Guidance for environmentally representative sampling and testing
- Section 5. Conclusions and recommended research
- References
- Appendix A. Literature review, studies, and research overview
- Appendix B. Example toxicity test report.

This report is available for free download (22.4 MB):

http://onlinepubs.trb.org/Onlinepubs/acrp/acrp_rpt_134.pdf

Research Digest

Item 2

Understanding airport air quality and public health studies related to airports

TRANSPORTATION RESEARCH BOARD (TRB)

ACRP Report 135 • 2015

"TRB's Airport Cooperative Research Program (ACRP) Report 135: Understanding Airport Air Quality and Public Health Studies Related to Airports explores the following air quality issues: the literature regarding standards and regulations; issues at airports; health impacts and risks; and the industry's current understanding of its health impacts."--TRB publications page (94 pages)

CONTENTS

- Summary of findings
- Chapter 1. Introduction
- Chapter 2. Ambient air quality standards and regulations
- Chapter 3. Airport air quality background
- Chapter 4. Air quality health impacts and risks
- Chapter 5. Current understanding of airport air quality health impacts
- Chapter 6. Conclusions
- Chapter 7. Recommendations for future research
- Acronyms
- Appendix A. Literature review summary and references
- Appendix B. Frequently asked questions

This report is available for free download (1.7 MB):

http://onlinepubs.trb.org/Onlinepubs/acrp/acrp_rpt_135.pdf

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Item 3

Implementing Integrated Self-Service at Airports

TRANSPORTATION RESEARCH BOARD (TRB)

ACRP Report 136 / CRP CD 168 • 2015

"[This report] provides guidelines for considering, evaluating, and making strategic decisions for implementing and optimizing a comprehensive passenger self-service experience for a variety of sizes of U.S. airports and their stakeholders. These guidelines include an inventory of self-service applications and technologies with their respective benefits; establishment of a decision-making roadmap to implement self-service; identification of associated infrastructure and airport/airline/other stakeholder integration requirements of multiple self-service applications; guidance for developing business cases for various stakeholders; determination of operational requirements to include staffing and maintenance; consideration of regulatory requirements and industry standards; identification of potential integrations of other non-passenger self-service applications to facilitate employee and tenant services; and demonstration of how various stakeholder technologies can combine into one cohesive system. Bound into the report is CRP-CD-168, which provides tools to assist the user in developing an integrated passenger self-service program. The tools include the Business Case Development Guide, the Passenger Self-Service Inventory, the Passenger Self-Service Environment Map, and Summary Descriptions of Enabling Technologies." --Foreword (106 pages; 145.3 MB)

- Accompanying CD-ROM contains "Integrated Self-Service Tools for ACRP Report 136"

This report is available for free download (website with report and CD-ROM downloads):

<http://www.trb.org/Publications/Blurbs/172884.aspx>

Item 4

Preventive Maintenance at General Aviation Airports. Volume 1, Primer

TRANSPORTATION RESEARCH BOARD (TRB)

ACRP Report 138 vol.1 • 2015

"[ACRP Report 138] is published as a two-volume set. Volume 1 is a primer for airport governing- and policy-board members on the importance and value of a preventive maintenance (PM) program. Volume 2 is a guidebook for airport managers, maintenance managers, and all line personnel on how to plan, prioritize, and conduct preventive maintenance for physical infrastructure assets. This Volume 1 Primer begins by discussing the value of airports to communities and the national airspace system. It reviews the various infrastructure assets at airports and outlines the value of planning and prioritizing preventive maintenance into the budgeting process and the impacts to operations if an airport fails to conduct preventive maintenance. It also identifies basic principles for establishing and implementing a preventive maintenance program." --Foreword (41 pages)

This report is available for free download (2.7 MB):

http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_138v1.pdf

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Item 5

Guidebook on Best Practices for Airport Cybersecurity

TRANSPORTATION RESEARCH BOARD (TRB)

ACRP Report 140 / CRP CD 171 • 2015

Cybersecurity is a growing issue for all organizations, including airports. While the risks to traditional information technology (IT) infrastructure are often highlighted, many airports also rely on industrial control systems that introduce risks that are less apparent. The increasing practice of Bring Your Own Device (BYOD), whereby employees use their own personal devices for business purposes such as email and remote access to airport systems, brings its own risks that must be managed. These risks cannot be eliminated, but they can be reduced through implementation of industry standards, best practices, and awareness programs for employees. This report provides resources for airport managers and IT staff to reduce or mitigate inherent risks of cyberattacks on technology-based systems. Traditional IT infrastructure such as servers, desktops, and network devices are covered along with increasingly sophisticated and interconnected industrial control systems, such as baggage handling, temperature control, and airfield lighting systems. Accompanying this guidebook is a CD-ROM (CRP-CD-171) of multimedia material that can be used to educate all staff at airports about the need, and how, to be diligent against cybersecurity threats.

(151 pages; 355.1 MB)

- Accompanying CD-ROM contains "Multimedia material Supporting the Guidebook on Best Practices for Airport Cybersecurity"

This report is available for free download (Website with report and CDROM download links):

<http://www.trb.org/Main/Blurbs/172854.aspx>

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Item 6

Renewable Energy as an Airport Revenue Source

TRANSPORTATION RESEARCH BOARD (TRB)

ACRP Report 141 • 2015

"[This report] explores challenges airports may anticipate when considering renewable energy as a revenue source. These considerations include the airport's geography and terrain, infrastructure, real estate, energy costs, public policy, regulatory and compliance requirements, tax credits, sponsor assurances, ownership, impacts to navigation and safety, security, staffing issues, and many others. The guidebook also includes detailed financial information on the cost and performance of projects that have been implemented by airports." --TRB publications page
(204 pages)

CONTENTS

- Chapter 1. Introduction to Renewable Energy in the Airport Environment
- Chapter 2. Applying Evaluation Factors to Airport Renewable Energy
- Chapter 3. Conducting Financial Assessments of Airport Renewable Energy
- Chapter 4. Implementing Airport Renewable Energy Projects
- Chapter 5. Case Summaries
- Appendix A. List of Airport Solar Projects in the United States
- Appendix B. Biofuel Feedstock Propagation Future Opportunity
- Appendix C. Renewable Energy Funding Matrix
- Appendix D. State Renewable Energy Programs: Example of North Carolina
- Appendix E. Solar Feasibility Assessment: Monterey Regional Airport
- Appendix F. Sample RFPs

This report is available for free download (website with guidebook and Appendix download links): <http://www.trb.org/main/blurbs/172634.aspx>

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Item 7

Applying an SMS approach to wildlife hazard management

TRANSPORTATION RESEARCH BOARD (TRB)

ACRP Report 145 / CRP-CD-173 • 2015

"This report introduces and guides the application of a risk-based approach to wildlife hazard management (WHM) programs and outlines additional steps for integrating such programs into an airport's Safety Management System (SMS). This guidance includes a description of an SMS approach to WHM and includes a glossary of key terms; a listing of relevant resources and databases; an overview description of four components of SMS; a comparison of current WHM standards to those used in SMS; a description of innovative protocols and procedures--in narrative and visual formats--for developing WHM programs in the style of SMS; and applicability to airports of various sizes and operations regardless of SMS implementation, wildlife program, or Part 139 certification. This report also provides a customizable tool (CRP-CD-173) "the Wildlife Hazard Management Risk Assessment Tool (WHaMRAT)" and templates that are usable for assessing wildlife risk at airports. The tool includes a resource summary of existing database wildlife hazard descriptions; numerical values for hazard severity and likelihood by species, derived from the FAA Wildlife Strike Database; and a practical, simplified electronic or manual risk analysis template, which includes the incorporation of variables on or off the airport." -- TRID (58, A-1, B-5, C-167; 22.2 MB)

- Accompanying CD-ROM contains "Wildlife Hazard Management Risk Assessment Tool (WHaMRAT)"

CONTENTS

- Chapter 1. Introduction and project overview
- Chapter 2. Wildlife hazard management background
- Chapter 3. Safety Management System overview
- Chapter 4. The Safety Management System and wildlife hazard management
- Chapter 5. Introduction to the Wildlife Hazard Management Risk Assessment Tool (WHaMRAT)
- Chapter 6. The EZ-Version WHaMRAT
- Chapter 7. The Advanced-Version WHaMRAT
- Chapter 8. Case study examples
- Chapter 9. Conclusions and suggested research
- Glossary
- Abbreviations
- References
- Appendix A. Development and test airports
- Appendix B. Summary of WHM and SMS survey findings
- Appendix C. The WHaMRAT user guide.

This report is available for free download (Website with report and CD-ROM download links):

<http://www.trb.org/Main/Blurbs/173318.aspx>

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Item 8

Lessons learned from airport sustainability plans

TRANSPORTATION RESEARCH BOARD (TRB)

ACRP Synthesis 66 • 2015

"This synthesis explores sustainability initiatives at smaller U.S. airports. The synthesis presents an analysis of survey responses and provides information gained from the telephone interviews to help inform airport leadership and employees who are considering, developing, or implementing sustainability plans." --

Publisher's description. (88 pages)

CONTENTS

- Summary
- Chapter 1. Introduction
- Chapter 2. Study method and results
- Chapter 3. Developing sustainability plans
- Chapter 4. Drivers, aids, and barriers to sustainability programs
- Chapter 5. EONS components
- Chapter 6. Case examples
- Chapter 7. Conclusions
- References
- Appendix A. Survey tool and selected responses
- Appendix B. List of airports responding to the survey
- Appendix C. Historical context of Synthesis S14-02-11
- Appendix D. Airport sustainability tracking tools
- Appendix E. Publications addressing airport sustainability

This report is available for free download (14.6 MB):

http://onlinepubs.trb.org/Onlinepubs/acrp/acrp_syn_066.pdf

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Item 9

Strategies for Maintaining Air Service: A Synthesis of Airport Practice

TRANSPORTATION RESEARCH BOARD (TRB)

ACRP Synthesis 68 • 2015

"In many communities, airports are struggling to maintain the air service that they currently enjoy and require in order for their communities to thrive. In response, airport managers are evaluating current and traditional strategies to both attract and maintain air service, as well as new strategies being pursued by many smaller and medium-sized airports designed to reduce the start-up and ongoing costs to incumbent carriers and to increase long-term market viability. Through a literature review and interviews with 61 airports and four airline route planners, this report describes those practices that smaller airports use to maintain air service." -- TRID

(52 pages)

CONTENTS

- Summary
- Chapter 1. Introduction
- Chapter 2. Methodology and respondent characteristics
- Chapter 3. Factors influencing air service
- Chapter 4. Strategies for maintaining air service
- Chapter 5. Conclusions and suggestions for further research
- Glossary of acronyms
- References
- Bibliography
- Appendix A. Survey : airports
- Appendix B. Summary of responses : airports
- Appendix C. Survey : air carrier network planning staff
- Appendix D. Sample air service incentive program.

This report is available for free download (17.5 MB):

http://onlinepubs.trb.org/Onlinepubs/acrp/acrp_syn_068.pdf

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Item 10

Implementing the freight transportation data architecture: Data Element Dictionary

TRANSPORTATION RESEARCH BOARD OF THE NATIONAL ACADEMIES

CTR NCFRP Report 35 • 2015

This report "provides the findings of the research effort to develop a freight data dictionary for organizing the myriad freight data elements currently in use. The research identifies differences in data element definitions and methods for bridging those differences where appropriate. A product of this research effort is a searchable and sustainable web-based freight data element dictionary for transportation analysis that will be hosted by the U.S. Department of Transportation's Bureau of Transportation Statistics (BTS)." --

Foreword

(149 pages)

CONTENTS

- Foreword
- Chapter 1. Background
- Chapter 2. The Web-Based Freight Data Element Dictionary
- Chapter 3. Freight Data Uses
- Chapter 4. Inventory of Freight Data Sources, Dictionaries, and Glossary Terms
- Chapter 5. Classifying Data Elements Across Databases
- Chapter 6. Differences in Data Element Definitions
- Chapter 7. Resolving Differences in Data Element Definitions
- Chapter 8. Conclusions and Suggested Future Steps
- Sources
- References
- Abbreviations

This report is available for free download (8.1 MB):

http://onlinepubs.trb.org/Onlinepubs/ncfrp/ncfrp_rpt_035.pdf

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Item 11

Guidebook on alternative quality management systems for highway construction

TRANSPORTATION RESEARCH BOARD (TRB)

NCHRP Report 808 • 2015

"This guidebook provides recommendations and tools to assist in developing quality management systems (QMSs) and assistance in creating a better definition of quality management in the context of alternative project delivery. The roles of owners and contractors in QMSs are changing, leading to variation in the roles and responsibilities of quality assurance organization (QAO). These range from the agency-dominated system of quality management associated with the traditional design-bid-build (DBB) method to design-build (DB)/public-private partnership (PPP) agreements where the responsibility for quality management is shared to varying degrees between the contractor and owner. The chapters in this report address the business case for alternative QMSs, QAOs, QAO selection, and useful tools for an alternative QMS. This report will be valuable to highway construction engineers by facilitating the development of QMSs for evolving alternative project delivery methods."--Foreword
(82 pages)

CONTENTS

- Chapter 1. Introduction
- Chapter 2. The business case for alternative quality management systems
- Chapter 3. Quality assurance organizations
- Chapter 4. Quality assurance organization selection
- Chapter 5. Useful tools for an alternative quality management system
- Appendix A. Glossary of terms
- Appendix B. Common quality management tools
- Appendix C. Highway project quality assurance organization selection guide
- Abbreviations, acronyms, and initialisms.

This report is available for free download (1.9 MB):

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_808.pdf

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Item 12

Consideration of Preservation in Pavement Design and Analysis Procedures

TRANSPORTATION RESEARCH BOARD (TRB)

NCHRP Report 810 • 2015

"This report presents information on the effects of preservation on pavement performance and service life and describes three different approaches for considering these effects in pavement design and analysis procedures. These approaches could serve as a basis for developing procedures for incorporating preservation in the AASHTO Mechanistic-Empirical Pavement Design Guide: A Manual of Practice (MEPDG) and the AASHTOWare Pavement ME Design software. After an introductory Chapter the chapters cover: state of the practice; an assessment of consideration of preservation in MEPDG models; response models for consideration of the effects of preservation in the MEPDG procedures; calibrating MEPDG models to account for preservation; and using modified material and pavement structural properties in MEPDG models to account for preservation. The last chapter provides a summary and recommendations for research. Appendices A through I contained in the research agency's final report provide elaborations and detail on several aspects of the research; they are not available in the printed report but are available on the TRB website (www.trb.org)." From TRID (60 pages)

CONTENTS

- Chapter 1. Introduction
- Chapter 2. State of the practice
- Chapter 3. Assessment of consideration of preservation in MEPDG models
- Chapter 4. Developing response models for considering the effects of preservation in the MEPDG procedures
- Chapter 5. Calibrating MEPDG models to account for preservation
- Chapter 6. Using modified material and pavement structural properties in MEPDG models to account for preservation
- Chapter 7. Summary and recommendations for research
- References
- Appendices A through I

This report is available for free download (2.2 MB):

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_810.pdf

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Item 13

Institutionalizing safety in transportation planning processes: techniques, tactics, and strategies

TRANSPORTATION RESEARCH BOARD (TRB)

NCHRP Report 811 • 2015

"NCHRP Report 811 provides state departments of transportation (DOTs) and metropolitan planning organizations (MPOs) with a practical, field tested guidebook on institutionalizing the continuous integration of safety into transportation planning and programming processes. The guidebook provides techniques, tactics, and strategies for agencies to use to institutionalize safety as a decision and planning factor. This guidebook should be useful to state, regional, and local transportation agencies; professional associations; and interest groups in examining how, and how effectively, safety has been integrated into transportation planning processes."--Foreword

(46 pages)

CONTENTS

- Chapter 1. Introduction
- Chapter 2. A transportation safety planning framework
- Chapter 3. Core concepts and implementation
- References
- Abbreviations and acronyms

This report is available for free download (8.6 MB):

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_811.pdf

Item 14

Signal Timing Manual -- Second Edition

TRANSPORTATION RESEARCH BOARD (TRB)

NCHRP Report 812 • 2015

"In addition to covering basic and advanced signal timing concepts, this second edition of the Signal Timing Manual addresses establishment of a signal timing program including setting multimodal operational performance measures and outcomes, determining staffing needs, and monitoring and maintaining the system. Some of the advanced concepts addressed include the systems engineering process; adaptive signal control; preferential treatment (e.g., rail, transit, and emergency vehicles); and timing strategies for oversaturated conditions, special events, and inclement weather. The manual will be useful to traffic engineers and signal technicians at any agency operating traffic signals." -- TRID

(317 pages)

CONTENTS

- Chapter 1. Introduction
- Chapter 2. Signal timing program
- Chapter 3. Signal timing concepts
- Chapter 4. Signal design
- Chapter 5. Introduction to timing plans
- Chapter 6. Intersection/uncoordinated timing
- Chapter 7. System/coordinated timing
- Chapter 8. Implementation and maintenance
- Chapter 9. Advanced signal systems
- Chapter 10. Preferential treatment
- Chapter 11. Special conditions
- Chapter 12. Oversaturated conditions
- Appendix A. Glossary.

This report is available for free download (16.2 MB):

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_812.pdf

Item 15

Methods and Practices on Reduction and Elimination of Asphalt Mix Segregation: A Synthesis of Highway Practice

TRANSPORTATION RESEARCH BOARD (TRB)

NCHRP Synthesis 477 • 2015

"The report documents methods and practices on reduction and elimination of asphalt mix segregation. This synthesis provides guidance on how to reduce or eliminate segregation during aggregate production, mix design, asphalt mix production, mix transport and transfer, and placement. Successful options for reducing or eliminating segregate, as well as caveats for what not to do, are included for the following topics: segregation descriptions and segregation specifications (standard sections, advantages, disadvantages, incentives/ disincentives, and desired changes)" --Preface

(106 pages)

This report is available for free download (19 MB):

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_477.pdf

Research Digest

Item 16

Design and Load Testing of Large Diameter Open-Ended Driven Piles: A Synthesis of Highway Practice

TRANSPORTATION RESEARCH BOARD (TRB)

NCHRP Synthesis 478 • 2015

"This report compiles and documents information regarding the current state of practice with respect to the selection, use, design, construction, and quality control of large diameter open-ended driven piles (LDOEPs) for transportation structures. This report is intended to provide agencies with information to develop guidance and methods to be incorporated into technical guides and design codes, as well as to identify gaps in knowledge to guide future research." --Preface (128 pages)

This report is available for free download (25.1 MB):

http://onlinepubs.trb.org/Onlinepubs/nchrp/nchrp_syn_478.pdf

Item 17

Economic and development implications of transportation disinvestment: A Synthesis of Highway Practice

TRANSPORTATION RESEARCH BOARD (TRB)

NCHRP Synthesis 480 • 2015

"This synthesis examines methods available to estimate disinvestment effects on transportation system integrity within and across modes in urban areas, regionally, and in non-metro areas, and the use of those methods by transportation agencies. The report focuses on macroeconomic effects, intermodal tradeoffs, and methods for broadly informing disinvestment decision making in an era of constrained resources. The report includes information on economic forecasting and travel demand models, risk or probability models, needs models, and benefit and impact models."--TRB publications page (59 pages)

CONTENTS

- Summary
- Chapter 1. Introduction
- Chapter 2. Review of current research and practice
- Chapter 3. Summary of case examples of disinvestment
- Chapter 4. State of the practice review
- Chapter 5. Conclusions
- Glossary of terms and acronyms
- References
- Appendix A. Case example description of screening criteria and discussion guide
- Appendix B. Descriptive summary of survey results
- Appendix C. Future research needs.

This report is available for free download (3.1 MB):

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_480.pdf

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Item 18

Current Practices to Set and Monitor DBE Goals on Design-Build Projects and Other Alternative Project Delivery Methods: A Synthesis of Highway Practice

TRANSPORTATION RESEARCH BOARD (TRB)

NCHRP Synthesis 481 • 2015

"This report reviews and synthesizes current practices and challenges that state departments of transportation (DOTs) face as they set and monitor the Federal Disadvantaged Business Enterprise (DBE) program goals on design-build and other alternative delivery projects. This study focuses on key issues associated with DBE contract goals, including how requirements are established, how submissions are evaluated, how program compliance is monitored through the contract, and what mechanisms are available to state DOTs for enforcement." --Preface

(128 pages)

This report is available for free download (39.6 MB):

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_481.pdf

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Item 19

The essential federal role in highway research and innovation

TRANSPORTATION RESEARCH BOARD OF THE NATIONAL ACADEMIES

SR 317 • 2015

"TRB Special Report 317: The Essential Federal Role in Highway Research and Innovation summarizes conclusions and advice on the Federal Highway Administration's (FHWA's) critical role in highway research, development, and technology (RD&T) that have been developed over the years by TRB's Research and Technology Coordinating Committee (RTCC). The RTCC is charged to monitor and review the FHWA's research and technology activities; provide advice to FHWA on the setting of a research agenda and coordination of highway research with states, universities, and other partners; review strategies to accelerate the deployment and adoption of innovation; and identify areas where research may be needed. The RTCC concludes that FHWA plays an essential role in exploratory, advanced research; addresses national priorities that other highway RD&T programs do not address; and facilitates adoption of innovations at the state and local level through technology transfer. Along with its other responsibilities, the RTCC notes that FHWA will play a particularly important role with ensuring the standardization of safety alerts to motorists between infrastructure and vehicles as part of the national connected vehicle initiative as well as assisting transportation agencies in implementing the many innovations developed in the second Strategic Highway Research Program (SHRP 2)."--TRB Publications Page (ix, 52 pages)

CONTENTS

- Challenges and opportunities
- Highway research: a proven route to the future
- Highway RD&T program organization and focus
- Current and future FHWA role
- References
- Study Committee Biographical Information

This report is available for free download (1 MB):

<http://onlinepubs.trb.org/onlinepubs/sr/sr317.pdf>