

Research Digest

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Item 1

Developing a Business Case for Renewable Energy at Airports

TRANSPORTATION RESEARCH BOARD (TRB)

ACRP Report 151 / CRP-CD-177 • 2016

"This report is a guidebook to help airports understand renewable energy opportunities. The report includes instructions and tools to evaluate proposed renewable energy projects and their alternatives so that an informed decision that maximizes financial, self-sustainability, environmental, and social benefits can be reached. The report lays out what a business case is, why renewable energy is important, and what a business case for renewable energy looks like. It describes the importance of identifying the project objective and understanding how renewable energy might fit into an airport's vision. A decision-making matrix is included that contains criteria used to evaluate a renewable energy project with a system for weighting each factor based on an airport's particular objectives. The report presents a business case in the context of an airport's typical master planning and capital improvement planning processes including engagement of key stakeholders. The report provides a model business case that evaluates a solar photovoltaic facility, a fossil fuel generator, and a fuel cell as options for providing on-site electricity generation to improve an airport's energy stability and resiliency. It also includes examples of renewable energy business cases from both aviation and non-aviation organizations to highlight lessons learned. A sample request for proposals and a sample power purchase agreement are provided for project implementation. A CD-ROM (CRP-CD-177) provides supplemental information." -- from TRID (157 pages)

- Accompanying CD-ROM titled: Supplemental Information for ACRP Report 151

This report is available for free download:

<http://www.trb.org/ACRP/Blurbs/173592.aspx>

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Item 2

Guidebook for IROPS Stakeholder Communication & Coordination

TRANSPORTATION RESEARCH BOARD (TRB)

ACRP Report 153 / CRP-CD-180 • 2016

"This report provides details on strategies and tools for reducing IROPs [Irregular Operations] impacts on passengers. The guidebook will assist communication and coordination as airports and airlines implement IROPS contingency plans. Included are communication checklists and a strategy for obtaining and maintaining stakeholder contacts; a list of federal flight data resources and other technologies, which allow for expedited communication regarding diversions on a national, regional, and local scale; flow diagrams to illustrate the integration of communication and collaboration processes; case studies of a variety of scenarios depicting IROPS responses; scenarios and instructions for conducting tabletop exercises; and a tool to assist in predicting the risks associated with national, regional, and local IROPS events to improve planning and response. This CD-based tool (CRP-CD-180) includes a response plan for stakeholders' involvement in assessing the likelihood and severity of reoccurrence of IROPS impacts, data sources to help alert an airport when an IROPS event is likely to occur, and the ability to create reports on IROPS risk levels for the stakeholders. The case studies and tabletop exercises also serve as training materials and can be customized for any airport." -- from TRID
(213 pages)

- Accompanying CD-ROM titled: IROPS Tools for Planning, Communication & Coordination

This report is available for free download:

<http://www.trb.org/Main/Blurbs/174234.aspx>

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Item 3

Water Efficiency Management Strategies for Airports

TRANSPORTATION RESEARCH BOARD (TRB)

ACRP Report 154 / CRP-CD-181 • 2016

"This report provides a guidebook and tools that airport operators can use to design and institute a water efficiency management program specific to their facility. This report enables airport operators to understand water uses and usage at airports to generate a baseline water use profile specific to their airport activities, and to define appropriate water use targets. It will also help to evaluate appropriate water efficiency measures including their direct and indirect costs and benefits and develop a water efficiency management action plan. Among the many topics this report addresses are applicable water management tools and practices used worldwide within and outside of the airport industry; methods for collection, management, and analysis of data relevant to airport water management; collaboration and communication with the public and stakeholders, including water providers; program implementation strategies, including motivation for decision makers; infrastructure operation and maintenance considerations; and drought planning considerations. The End Use Water Audit Tool, which can be used to estimate an airport's baseline water footprint, and a Microsoft® Powerpoint presentation, which provides an overview of the guidebook and the toolbox, are provided on an accompanying CD-ROM (CRP-CD-181) and are also available on the TRB website." -- from TRID
(134 pages, 3.5 MB)

- Accompanying CD-ROM titled: End Use Water Audit Tool

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

<http://www.trb.org/Main/Blurbs/174444.aspx>

Item 4

Guidebook for managing compliance with federal regulations: an integrated approach

TRANSPORTATION RESEARCH BOARD (TRB)

ACRP Report 156 • 2016

"ACRP Report 156: Guidebook for Managing Compliance with Federal Regulations: An Integrated Approach provides guidance on managing compliance with federal regulations pertaining to the operation and management of airports including planning and development. Accompanying the guidebook is the Regulation Compliance Management (RCM) Tool, an index of the applicable statutes, federal regulations, executive orders, OMB Circulars, and other documents with their compliance requirements. Additionally, the RCM Tool is designed to track compliance and allow the addition of state and local regulations/requirements. The guidebook and tool will be useful for airport management and staff at all levels and all functions so that they can work together to ensure compliance in an efficient manner." -- Introduction
(54 pages)

This report is available for free download (18.9 MB):

http://onlinepubs.trb.org/Onlinepubs/acrp/acrp_rpt_156.pdf

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Item 5

Airport Sustainability Practices: Drivers and Outcomes for Small Commercial and General Aviation Airports: A Synthesis of Airport Practice

TRANSPORTATION RESEARCH BOARD (TRB)

ACRP Synthesis 69 • 2016

"Over the last several years airport operators have introduced green initiatives in order to improve the overall sustainability of their airports. Drivers could include financial viability, staffing considerations, or other social or environmental factors. There is a significant compilation of sustainability practices from larger airports, but a less robust description of initiatives for smaller airports. This report focuses on drivers and outcomes of green initiatives undertaken at small commercial and general aviation airports.

Information used in this study was acquired through a review of the literature and survey or interviews with airport operators at small and general aviation airports. Although the study found that more than half of small airports have adopted one or more sustainable initiatives and almost 20% have a formal sustainability plan in place, many of those participating in the study do not believe that their airport has an impact on the environment, and because of lack of funding and different priorities, they choose not to pursue sustainable initiatives. However, sustainability is more than environmental initiatives. These are barriers, but more airports will pursue sustainable initiatives if more funding is made available, sustainability incentives are created, or sustainability becomes a mandate." - TRID

(108 pages)

This report is available for free download (3.86 MB):

http://onlinepubs.trb.org/Onlinepubs/acrp/acrp_syn_069.pdf

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Item 6

Building information modeling for airports: A Synthesis of Airport Practice

TRANSPORTATION RESEARCH BOARD (TRB)

ACRP Synthesis 70 • 2016

"The objective of this synthesis is to deliver information about the general, current state of the art and practice in building information modeling (BIM) applications in industry and to provide a snapshot of existing experience related to the emergence of BIM in North American airports. The goal is to provide information about BIM and assist airports in understanding available opportunities, benefits, and value related to engaging in BIM. Information used in this study was acquired through a review of the literature and interviews with airport operators and industry experts. The study reveals that most of the respondent airports targeted in this study are in the early phases of BIM adoption—discovering barriers and overcoming barriers to implementation related to integration issues. However, a few airports are at the forefront of implementing and deploying BIM, such as Denver, Los Angeles, and Boston Logan. The results showed that BIM benefits are not generally realized in the short term. The importance of quantifying BIM benefit for cost savings and committing to long-term implementation was noted. Although the BIM activity levels for the airports currently range from low to very high, airports are realizing (basic) project-level BIM benefits, such as cost savings generated from early detection of issues. However, most have not yet fully integrated BIM throughout their organizations and are, therefore, not realizing organization-level (full facility life cycle) benefits, which is where the greatest benefit of BIM is realized." --

TRID

(viii, 86 pages)

This report is available for free download (5.8 MB):

http://onlinepubs.trb.org/Onlinepubs/acrp/acrp_syn_070.pdf

Item 7

Airport Safety Risk Management Panel Activities and Outcomes: A Synthesis of Airport Practice

TRANSPORTATION RESEARCH BOARD (TRB)

ACRP Synthesis 71 • 2016

"This synthesis compiles information and tools that help Part 139 airports conduct Safety Risk Assessments (SRAs) effectively. To identify the existing tools and state of the practice, a survey and interviews were conducted with Part 139 airports, foreign airports, military organizations, and Safety Management System (SMS) consultants who have been supporting airports with SMS implementation and leading Safety Risk Management panels. This report enhances ACRP Report 131: A Guidebook for Safety Risk Management for Airports with additional tools and templates, and presents the conclusions from the survey and interviews as well as the main findings from the literature review. Several tools and templates, including a Quick Reference Guide and a template for the SRA briefing, are provided in the appendices of this report." -

- from TRID

(120 pages)

This report is available for free download (11.95 MB):

http://onlinepubs.trb.org/Onlinepubs/acrp/acrp_syn_071.pdf

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Item 8

Effective Project Scoping Practices to Improve On-Time and On-Budget Delivery of Highway Projects

TRANSPORTATION RESEARCH BOARD (TRB)

NCHRP Report 821 • 2016

"This guidebook demonstrates how a state transportation agency (STA) can improve its project scoping process (PSP) and practices to produce a project cost estimate and schedule that facilitate programming decision making and accountability. It illustrates the effort needed to develop a robust cost estimate and then manage to a baseline budget and scope throughout the project delivery cycle. The guidebook consists of two parts. Part 1, "Research Results about the PSP," addresses the following issues: why STAs should formalize the PSP; current practices for PSP; and how agencies can implement an effective PSP. Part 2, "Implementation Guidelines," provides an easy-to-understand layout and describes how to implement the PSP. The guidelines are divided into three sections. Each section details one of the three major activities of the PSP—develop the project, analyze the alternatives and document findings, and develop the recommended alternative. The guidelines also have two appendices. The first appendix summarizes the tools that can be used while performing different activities in the scope development process. The second appendix is the list of online links to various resources and tools to support the PSP, as referenced in this guidebook." -- TRID
(176 pages)

This report is available for free download (19.41 MB):

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_821.pdf

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Item 9

Evaluation and Assessment of Environmentally Sensitive Stream Bank Protection Measures

TRANSPORTATION RESEARCH BOARD (TRB)

NCHRP Report 822 / CRP-CD-183 • 2016

"TRB's National Cooperative Highway Research Program (NCHRP) Report 822: Evaluation and Assessment of Environmentally Sensitive Stream Bank Protection Measures evaluates and assesses existing guidelines for the design, installation, monitoring, and maintenance of environmentally sensitive stream bank stabilization and protection measures, and develops quantitative engineering design guidance for selected treatments. Updated design guidelines for three widely used treatments are presented: live siltation and live staking with a rock toe, vegetated mechanically stabilized earth, and vegetated rip rap. A compendium of field data, documentation, and photographs complement the report. The compendium is available as a DVD and available for download from TRB's website as an ISO image." -- TRB (xi, 250 pages; 859 MB)

- Accompanying CD-ROM contains: NCHRP Report 822 Compendium of Field Data, Documentation, and Photographs; NCHRP Project 24-39

CONTENTS

- Chapter 1. Introduction and Research Approach
- Chapter 2. Findings
- Chapter 3. Testing and Appraisal of Testing Results
- Chapter 4. Design Guidelines and Appraisal of Research Results
- Chapter 5. Conclusions and Suggested Research
- References
- Appendix A. NCHRP Report 544 Findings on Selected Treatments
- Appendix B. Survey Form
- Appendix C. Field Data Form

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

<http://www.trb.org/Main/Blurbs/174448.aspx>

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Item 10

Guidelines for certification and management of flexible rockfall protection systems

TRANSPORTATION RESEARCH BOARD (TRB)

NCHRP Report 823 • 2016

"This report provides guidelines to assist transportation agencies to obtain the data necessary to evaluate the results of rockfall fence systems tested using the procedure recommended for acceptance. Guidelines for asset management for rockfall fence systems were developed and are presented to assist transportation agencies in incorporating these systems into existing transportation asset management plans. The first chapter provides background, and the following chapters address: European ETAG 27 Testing Standards; Proposed ETAG 27 Acceptance Procedures for Agencies; Proposed Inventory and Condition Assessment of Rockfall Fence Systems for Agencies; Management of Rockfall Fence Systems After Inventory and Condition Assessment; and Proposed Performance-Based Special Provision for Rockfall Fence Systems." --

TRID

(23 pages)

This report is available for free download (16 MB):

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_823.pdf

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Item 11

Guidelines for Nighttime Visibility of Overhead Signs

TRANSPORTATION RESEARCH BOARD (TRB)

NCHRP Report 828 • 2016

"This report presents proposed guidelines for nighttime overhead sign visibility, formatted as a potential replacement for the current Chapter 10, Roadway Sign Lighting, in the 2005 AASHTO Roadway Lighting Design Guide. The research for the project was conducted in two phases. In the first phase, a closed-course study was conducted at the Virginia Smart Road at the Virginia Tech Transportation Institute. The goal of this study was to determine legibility distances for drivers in controlled conditions for three different sign legend and background configurations lit by either high pressure sodium or light emitting diode systems or they were unlit. In the second phase, an open-road study was conducted by the Texas A&M Transportation Institute in three urban areas—Bryan/College Station, Texas; San Antonio, Texas; and Orlando, Florida. The goal of the open-road study was to determine the effects of sign luminance and visual complexity on the distance at which a driver can read overhead signs and street signs. Both studies employed cohorts of recruited drivers evenly split in terms of gender and age. The closed-course study found that sign lighting does not significantly impact legibility distance of signs in rural and dark areas, suggesting that sufficient illumination for visibility was provided by headlamps. Using software developed for the open-road study, digital images were analyzed to quantitatively measure visual complexity in urban and suburban areas. Visual complexity of sign surroundings was found to reduce the distance at which a driver can correctly recognize information from signs, however, this effect can be countered by increases in the legend luminance. This report fully documents the research and includes four appendixes: Incremental Effects of Light Sources and Sign Sheeting on Legend Luminance for Overhead Guide Signs; Assessment of Background Complexity Using Digital Images of Roadway Scenes by Image Processing; Open-Road Study Details; and Guidelines for Nighttime Overhead Sign Visibility." -TRID
(vii, 72 pages)

This report is available for free download (21.4 MB):

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_828.pdf

Item 12

Roundabout Practices: A Synthesis of Highway Practice

TRANSPORTATION RESEARCH BOARD (TRB)

NCHRP Synthesis 488 • 2016

"TRB's National Cooperative Highway Research Program (NCHRP) Synthesis 488: Roundabout Practices summarizes roundabout policies, guidance, and practices within state departments of transportation (DOTs) as of 2015. The synthesis may be used as a reference for state agencies that are creating or updating their roundabout and intersection control policies." --Publisher's description
(81 pages)

This report is available for free download (62.71 MB):

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_488.pdf

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Item 13

Extending Bridge Service Life Through Field Welded Repair and Retrofits: A Synthesis of Highway Practice

TRANSPORTATION RESEARCH BOARD (TRB)

NCHRP Synthesis 489 • 2016

"This synthesis documents practices associated with field welded repairs on existing steel bridges used by bridge owners. The information presented includes the extent to which field welding is performed on existing bridges, common types of field welded repairs and retrofits, specifications, and quality control practices. Information used in this study was gathered through a literature review and a survey of state departments of transportation. Follow-up interviews with selected agencies provided additional information." -- from TRID

(65 pages)

This report is available for free download (16.9 MB):

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_489.pdf

Item 14

Practice of Rumble Strips and Rumble Stripes: A Synthesis of Highway Practice

TRANSPORTATION RESEARCH BOARD (TRB)

NCHRP Synthesis 490 • 2016

"This synthesis documents current practices used by states installing rumble strips and explores variations in practice in terms of design, criteria, and locations for installation, maintenance, perceived benefits, communication of benefits, and important issues. Information was acquired through a literature review, survey on current practice, and case examples. The survey also included questions specific to the state of practice for rumble strips, which is the term used when the pavement marking lines are painted on the rumble strip in an effort to increase visibility during inclement weather conditions. The findings indicate that two-thirds of the state agencies rely on traditional methods to address the noise issue: skipping rumbles in residential areas, adjusting their depth, or not installing rumbles at all. The overwhelming majority of responding states, 83%, have developed policies or guidance to modify their rumble design practices to be sensitive to cyclists. Fewer than half the respondents have developed policies/guidance to address pavement deterioration; several agencies indicated that pavement condition is a factor on whether to install a rumble or not. The survey also showed that very few state DOTs have created public campaigns to explain that the use of rumbles improves safety so that complaints regarding noise, bicycle issues, and other are minimized." -- TRID

(52 pages)

This report is available for free download (9.2 MB):

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_490.pdf

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Item 15

Practices for High-Tension Cable Barriers: A Synthesis of Highway Practice

TRANSPORTATION RESEARCH BOARD (TRB)

NCHRP Synthesis 493 • 2016

"This synthesis study was conducted to identify and report on the current state of the practice for HTCBBs used in medians of access-controlled roadways in the United States. Information on HTCBB systems related to state agency specifications, special provisions, design standards, and installation and maintenance concerns was collected. Because all HTCBB systems currently eligible for use on public roads in the United States are proprietary, information was also obtained from each of the manufacturers of these systems." --

Summary

(55 pages)

This report is available for free download (36.2 MB):

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_493.pdf

Item 16

Life-cycle cost analysis for management of highway assets: A Synthesis of Highway Practice

TRANSPORTATION RESEARCH BOARD (TRB)

NCHRP Synthesis 494 • 2016

"This report documents the state of the practice of state highway agencies related to their incorporation of life-cycle cost analysis (LCCA) and risk-based analysis into their asset management plans for pavements and bridges on the National Highway System. The objective of this project was to develop an inventory of quantitative asset-level, project-level, or corridor-level processes and models for predicting life-cycle costs associated with the preservation and replacement of highway assets. The report includes a literature review, a survey of highway agencies, and case studies that document specific highway agency experiences with LCCA." -- TRID

(35 pages)

This report is available for free download (2.1 MB):

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_494.pdf

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Item 17

Intercity Passenger Rail in the Context of Dynamic Travel Markets

TRANSPORTATION RESEARCH BOARD (TRB)

NCRRP Report 4 • 2016

"This report develops an analytical framework or structural plan to improve understanding of how current or potential intercity travelers make the choice to travel by rail. This framework provides guidance for use by practitioners and decision makers considering alternative planning, operating, financing, service, and capital investment strategies for intercity passenger rail service in existing and potential travel markets; and it allows users to evaluate how mode choice is affected by a variety of changing and evolving parameters. The framework developed through this research is based on an examination of fundamental values, preferences, and attitudes affecting travel mode choice. Identification of relevant parameters extracted from this analysis served as input to a comprehensive survey used to gather necessary data for developing an Integrated Choice/Latent Variable (ICLV) forecasting model. Building directly on the results calculated in this forecasting model is the scenario testing tool, a series of interconnected spreadsheets which make available to the analyst a wide variety of data and procedures needed in the application of quick-turn-around scenario testing. Together, the ICLV forecasting model and scenario testing tool provide a sophisticated framework for analyzing intercity travel behavior." -- TRID
(120 pages)

This report is available for free download (26.9 MB):

http://onlinepubs.trb.org/onlinepubs/ncrrp/ncrrp_rpt_004.pdf

Item 18

Developing multi-state institutions to implement intercity passenger rail programs

TRANSPORTATION RESEARCH BOARD (TRB)

NCRRP Report 5 • 2016

"This report presents practical models of multi-state institutional arrangements for planning, developing, and operating intercity passenger rail networks and services. These models are designed to function in the context of rail passenger service currently provided by Amtrak and in response to the primary goal of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA) to provide more flexibility in developing and supporting intercity passenger rail operations in the United States. As a fundamental step in the process, the report constructs a conceptual framework of the intercity passenger rail visioning, planning, and project development and operations process using key characteristics and components to formulate alternative institutional models. Building on this framework approach, the report offers eight models of possible institutional relationships and a practitioners' guide to help determine which model is more appropriate given the particular issues faced by those interested in establishing an intercity passenger rail service. Case studies of intercity passenger rail initiatives and non-transportation, multi-agency programs are summarized in this report and detailed in a companion volume available as NCRRP Web-Only Document 3 on the TRB website. This document also includes background information on various regulations guiding formation of multi-jurisdictional institutions." -- TRID
(126 pages)

This report is available for free download (24.6 MB):

http://onlinepubs.trb.org/onlinepubs/ncrrp/ncrrp_rpt_005.pdf