

ACRP

AIRPORT
COOPERATIVE
RESEARCH
PROGRAM

SPONSORED BY THE FEDERAL AVIATION ADMINISTRATION

2011 ANNUAL REPORT OF PROGRESS



ACRP OVERSIGHT COMMITTEE*

CHAIR

James Wilding
Metropolitan Washington Airports Authority
(retired)

VICE CHAIR

Jeff Hamiel
Minneapolis–St. Paul
Metropolitan Airports Commission

MEMBERS

James Crites
Dallas–Fort Worth International Airport
Richard de Neufville
Massachusetts Institute of Technology
Kevin C. Doliolo
Unison Consulting
John K. Duval
Austin Commercial, LP
Kitty Freidheim
Freidheim Consulting
Steve Grossman
Jacksonville Aviation Authority
Tom Jensen
National Safe Skies Alliance
Catherine M. Lang
Federal Aviation Administration
Gina Marie Lindsey
Los Angeles World Airports
Carolyn Motz
Airport Design Consultants, Inc.
Richard Tucker
Huntsville International Airport

EX OFFICIO MEMBERS

Paula P. Hochstetler
Airport Consultants Council
Sabrina Johnson
U.S. Environmental Protection Agency
Richard Marchi
Airports Council International—North America
Laura McKee
Air Transport Association of America
Henry Ogradzinski
National Association of State Aviation Officials
Melissa Sabatine
American Association of Airport Executives
Robert E. Skinner, Jr.
Transportation Research Board

SECRETARY

Christopher W. Jenks
Transportation Research Board

*Membership as of July 2011.

TRANSPORTATION RESEARCH BOARD 2011 EXECUTIVE COMMITTEE*

OFFICERS

CHAIR: **Neil J. Pedersen**, *Consultant, Silver Spring, MD*
VICE CHAIR: **Sandra Rosenbloom**, *Professor of Planning, University of Arizona, Tucson*
EXECUTIVE DIRECTOR: **Robert E. Skinner, Jr.**, *Transportation Research Board*

MEMBERS

J. Barry Barker, *Executive Director, Transit Authority of River City, Louisville, KY*
Deborah H. Butler, *Executive Vice President, Planning, and CIO, Norfolk Southern Corporation, Norfolk, VA*
William A.V. Clark, *Professor, Department of Geography, University of California, Los Angeles*
Eugene A. Conti, Jr., *Secretary of Transportation, North Carolina DOT, Raleigh*
James M. Crites, *Executive Vice President of Operations, Dallas-Fort Worth International Airport, TX*
Paula J. Hammond, *Secretary, Washington State DOT, Olympia*
Michael W. Hancock, *Secretary, Kentucky Transportation Cabinet, Frankfort*
Adib K. Kanafani, *Cahill Professor of Civil Engineering, University of California, Berkeley*
Michael P. Lewis, *Director, Rhode Island DOT, Providence*
Susan Martinovich, *Director, Nevada DOT, Carson City*
Joan McDonald, *Commissioner, New York State DOT, Albany*
Michael R. Morris, *Director of Transportation, North Central Texas Council of Governments, Arlington*
Tracy L. Rosser, *Vice President, Regional General Manager, Wal-Mart Stores, Inc., Mandeville, LA*
Steven T. Scalzo, *Chief Operating Officer, Marine Resources Group, Seattle, WA*
Henry G. (Gerry) Schwartz, Jr., *Chairman (retired), Jacobs/Sverdrup Civil, Inc., St. Louis, MO*
Beverly A. Scott, *General Manager and CEO, Metropolitan Atlanta Rapid Transit Authority, Atlanta, GA*
David Seltzer, *Principal, Mercator Advisors LLC, Philadelphia, PA*
Lawrence A. Selzer, *President and CEO, The Conservation Fund, Arlington, VA*
Kumares C. Sinha, *Olson Distinguished Professor of Civil Engineering, Purdue University, West Lafayette, IN*
Thomas K. Sorel, *Commissioner, Minnesota DOT, St. Paul*
Daniel Sperling, *Professor of Civil Engineering and Environmental Science and Policy; Director, Institute of Transportation Studies; and Interim Director, Energy Efficiency Center, University of California, Davis*
Kirk T. Steudle, *Director, Michigan DOT, Lansing*
Douglas W. Stotlar, *President and CEO, Con-Way, Inc., Ann Arbor, MI*
C. Michael Walton, *Ernest H. Cockrell Centennial Chair in Engineering, University of Texas, Austin*

EX OFFICIO MEMBERS

J. Randolph Babbitt, *Administrator, Federal Aviation Administration, U.S.DOT*
Rebecca M. Brewster, *President and COO, American Transportation Research Institute, Smyrna, GA*
Anne S. Ferro, *Administrator, Federal Motor Carrier Safety Administration, U.S.DOT*
LeRoy Gishi, *Chief, Division of Transportation, Bureau of Indian Affairs, U.S. Department of the Interior, Washington, DC*
John T. Gray, *Senior Vice President, Policy and Economics, Association of American Railroads, Washington, DC*
John C. Horsley, *Executive Director, American Association of State Highway and Transportation Officials, Washington, DC*
David T. Matsuda, *Deputy Administrator, Maritime Administration, U.S.DOT*
Michael P. Melaniphy, *President, American Public Transportation Association, Washington, DC*
Victor M. Mendez, *Administrator, Federal Highway Administration, U.S.DOT*
Tara O'Toole, *Under Secretary for Science and Technology, U.S. Department of Homeland Security, Washington, DC*
Robert J. Papp (Adm., U.S. Coast Guard), *Commandant, U.S. Coast Guard, U.S. Department of Homeland Security, Washington, DC*
Cynthia L. Quarterman, *Administrator, Pipeline and Hazardous Materials Safety Administration, U.S.DOT*
Peter M. Rogoff, *Administrator, Federal Transit Administration, U.S.DOT*
David L. Strickland, *Administrator, National Highway Traffic Safety Administration, U.S.DOT*
Joseph C. Szabo, *Administrator, Federal Railroad Administration, U.S.DOT*
Polly Trottenberg, *Assistant Secretary for Transportation Policy, U.S.DOT*
Robert L. Van Antwerp (Lt. Gen., U.S. Army), *Chief of Engineers and Commanding General, U.S. Army Corps of Engineers, Washington, DC*
Barry R. Wallerstein, *Executive Officer, South Coast Air Quality Management District, Diamond Bar, CA*
Gregory D. Winfree, *Acting Administrator, Research and Innovative Technology Administration, U.S.DOT*

*Membership as of November 2011.

ACRP

AIRPORT
COOPERATIVE
RESEARCH
PROGRAM

SPONSORED BY THE FEDERAL AVIATION ADMINISTRATION

2011 ANNUAL REPORT OF PROGRESS

Research sponsored by the Federal Aviation Administration

TRANSPORTATION RESEARCH BOARD

WASHINGTON, D.C.

2011

www.TRB.org

AIRPORT COOPERATIVE RESEARCH PROGRAM

Airports are vital national resources. They serve a key role in transportation of people and goods and in regional, national, and international commerce. They are where the nation's aviation system connects with other modes of transportation and where federal responsibility for managing and regulating air traffic operations intersects with the role of state and local governments that own and operate most airports. Research is necessary to solve common operating problems, to adapt appropriate new technologies from other industries, and to introduce innovations into the airport industry. The Airport Cooperative Research Program (ACRP) serves as one of the principal means by which the airport industry can develop innovative near-term solutions to meet demands placed on it.

The need for ACRP was identified in *TRB Special Report 272: Airport Research Needs: Cooperative Solutions* in 2003, based on a study sponsored by the Federal Aviation Administration (FAA). The ACRP carries out applied research on problems that are shared by airport operating agencies and are not being adequately addressed by existing federal research programs. It is modeled after the successful National Cooperative Highway Research Program and Transit Cooperative Research Program. The ACRP undertakes research and other technical activities in a variety of airport subject areas, including design, construction, maintenance, operations, safety, security, policy, planning, human resources, and administration. The ACRP provides a forum where airport operators can cooperatively address common operational problems.

The ACRP was authorized in December 2003 as part of the Vision 100-Century of Aviation Reauthorization Act. The primary participants in the ACRP are (1) an independent governing board, the ACRP Oversight Committee (AOC), appointed by the Secretary of the U.S. Department of Transportation with representation from airport operating agencies, other stakeholders, and relevant industry organizations such as the Airports Council International-North America (ACI-NA), the American Association of Airport Executives (AAAE), the National Association of State Aviation Officials (NASAO), and the Air Transport Association (ATA) as vital links to the airport community; (2) the TRB as program manager and secretariat for the governing board; and (3) the FAA as program sponsor. In October 2005, the FAA executed a contract with the National Academies formally initiating the program.

The ACRP benefits from the cooperation and participation of airport professionals, air carriers, shippers, state and local government officials, equipment and service suppliers, other airport users, and research organizations. Each of these participants has different interests and responsibilities, and each is an integral part of this cooperative research effort. Research problem statements for the ACRP are solicited periodically but may be submitted to the TRB by anyone at any time. It is the responsibility of the AOC to formulate the

research program by identifying the highest priority projects and defining funding levels and expected products.

Once selected, each ACRP project is assigned to an expert panel, appointed by the TRB. Panels include experienced practitioners and research specialists; heavy emphasis is placed on including airport professionals, the intended users of the research products. The panels prepare project statements (requests for proposals), select contractors, and provide technical guidance and counsel throughout the life of the project. The process for developing research problem statements and selecting research agencies has been used by TRB in managing cooperative research programs since 1962. As in other TRB activities, ACRP project panels serve voluntarily without compensation.

Primary emphasis is placed on disseminating ACRP results to the intended end-users of the research: airport operating agencies, service providers, and suppliers. The ACRP produces a series of research reports for use by airport operators, local agencies, the FAA, and other interested parties, and industry associations may arrange for workshops, training aids, field visits, and other activities to ensure that results are implemented by airport-industry practitioners.

ADDRESS AND CONTACT INFORMATION

Transportation Research Board
500 Fifth Street, NW
Washington, D.C. 20001
202-334-3224

<http://www.trb.org>

Address Inquiries to:

Christopher W. Jenks
Director, Cooperative Research Programs
202-334-3089
cjenks@nas.edu

Michael Salamone
Manager, Airport Cooperative Research Program
202-334-1268
msalamone@nas.edu

Cover photos courtesy of Jacksonville Aviation Authority, Jacksonville, Florida.

Cover design by Tony Olivis, Studio 2.

THE NATIONAL ACADEMIES

Advisers to the Nation on Science, Engineering, and Medicine

The **National Academy of Sciences** is a private, nonprofit, self-perpetuating society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare. On the authority of the charter granted to it by the Congress in 1863, the Academy has a mandate that requires it to advise the federal government on scientific and technical matters. Dr. Ralph J. Cicerone is president of the National Academy of Sciences.

The **National Academy of Engineering** was established in 1964, under the charter of the National Academy of Sciences, as a parallel organization of outstanding engineers. It is autonomous in its administration and in the selection of its members, sharing with the National Academy of Sciences the responsibility for advising the federal government. The National Academy of Engineering also sponsors engineering programs aimed at meeting national needs, encourages education and research, and recognizes the superior achievements of engineers. Dr. Charles M. Vest is president of the National Academy of Engineering.

The **Institute of Medicine** was established in 1970 by the National Academy of Sciences to secure the services of eminent members of appropriate professions in the examination of policy matters pertaining to the health of the public. The Institute acts under the responsibility given to the National Academy of Sciences by its congressional charter to be an adviser to the federal government and, on its own initiative, to identify issues of medical care, research, and education. Dr. Harvey V. Fineberg is president of the Institute of Medicine.

The **National Research Council** was organized by the National Academy of Sciences in 1916 to associate the broad community of science and technology with the Academy's purposes of furthering knowledge and advising the federal government. Functioning in accordance with general policies determined by the Academy, the Council has become the principal operating agency of both the National Academy of Sciences and the National Academy of Engineering in providing services to the government, the public, and the scientific and engineering communities. The Council is administered jointly by both Academies and the Institute of Medicine. Dr. Ralph J. Cicerone and Dr. Charles M. Vest are chair and vice chair, respectively, of the National Research Council.

The **Transportation Research Board** is one of six major divisions of the National Research Council. The mission of the Transportation Research Board is to provide leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal. The Board's varied activities annually engage about 7,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest. The program is supported by state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation. **www.TRB.org**

www.national-academies.org

COOPERATIVE RESEARCH PROGRAMS STAFF

Director

Christopher W. Jenks

Deputy Director

Crawford F. Jencks

Senior Program Officers

Gwen Chisholm Smith
Waseem Dekelbab
B. Ray Derr
Lawrence D. Goldstein
Marcia A. Greenberger
Amir N. Hanna
Edward T. Harrigan
Christopher Hedges
Andrew C. Lemer
Joseph Navarrete
Charles W. Niessner
Stephan A. Parker
David A. Reynaud
William C. Rogers
Michael R. Salamone, ACRP Manager
Theresia H. Schatz
Dianne S. Schwager
Nanda Srinivasan
Lori L. Sundstrom

Administrative Coordinator

Adrienne C. Blackwell

Administrative Assistant

Cynthia E. Butler

Program Associates

Joseph J. Brown-Snell
Sheila A. Moore

Senior Program Assistants

Melanie Adcock
Tiana M. Barnes
Megan A. Chamberlain
Andrea Harrell
Megha Khadka
Thu M. Le
Jeff Oser
Danna Powell
Charlotte Thomas

Program Assistant

Stephanie L. Campbell

Director of Publications

Eileen P. Delaney

Senior Editors

Natalie Barnes
Hilary Freer

Editors

Ellen M. Chafee
Doug English
Margaret B. Hagood
Scott E. Hitchcock

Assistant Editor

Maria Sabin Crawford

Information Technology Specialist

Roy N. Mesler

Letter From the AOC Chair

Early in 2011, the Airport Cooperative Research Program released its 100th publication and ended the year with a research library of 125 reports, syntheses, and digests. The publications cover a breadth of environmental, economic, performance, and legal subjects and offer practical insight to many of the issues that continue to challenge airports. For example, *ACRP Report 31: Innovative Approaches to Addressing Aviation Capacity Issues in Coastal Mega-regions* looks into aviation capacity issues in the two coastal mega-regions located along the East and West coasts of the United States. And, *ACRP Report 51: Risk Assessment Method to Support Modification of Airfield Separation Standards* offers practical insight into design criteria for separations between taxiways/taxilanes in support of requests for modification of standards. Each year, ACRP looks at topics addressing airport planning/design, information technology, and airport safety; seeks solutions to a variety of issues; and works with airport industry practitioners to offer guidance for airport efficiency and effectiveness.



We invite you to visit www.trb.org/acrp to see what we have going on and to download our growing list of publications.

Although, in the past 6 years ACRP has provided an abundance of research material to help airports, this year we have seen how the resource is generating beneficial impacts to the industry as airports implement ACRP results. Providing research that has value and usefulness to airports is extremely important. Yet, through the past year we began a thoughtful, orchestrated plan to reach deeper into the industry to distribute our publications and encourage practical application of ACRP research results.

Throughout 2011, the ACRP Oversight Committee has discussed and approved a variety of dissemination activities and considers it a continuing priority to reach out to a broad array of airport-practitioners as well as to evaluate our contribution to the airport industry. ACRP must employ a coordinated strategy that can collectively and affordably reach as many of the diverse airport industry groups as is practical. In the coming months and years you will see more outreach to this end.

The goal of ACRP is to provide well-researched, useful publications that can contribute to the growth and development of the nation's airport industry. We could not do this without the strong support and active participation of the Federal Aviation Administration, along with the highly professional and committed efforts of the TRB staff.

Sincerely Yours,

A handwritten signature in black ink that reads "James Wilding". The signature is written in a cursive, flowing style.

James Wilding

CONTENTS

Sixth Annual Report of Progress, 1

Background, 1

Program Participants, 1

Selection of Research, 2

Program Management, 3

Project Panels, 3

Selection of Contractors, 3

Funding, 4

Products, 4

Status, 4

Disseminating Results, 7

Documenting Success, 8

Publications of the Airport Cooperative Research Program, 19

Summary of Project Status Through December 31, 2011, 24

How to Order, 49

AIRPORT COOPERATIVE RESEARCH PROGRAM

Sixth Annual Report of Progress

December 31, 2011

BACKGROUND

Airports are vital national resources and a well-functioning airport system is essential to U.S. participation in the global economy. They serve a key role in the transportation of people and goods and in regional, national, and international commerce. Airports provide (and often operate) facilities and infrastructure that accommodate various services needed to access the national and international air transportation system. Airports are where the nation's aviation system connects with other modes of transportation and where federal responsibility for managing and regulating air traffic operations intersects with the roles of state and local governments that own and operate most airports.

When airport needs are not being adequately addressed by existing research programs, research is necessary to solve common operating problems, to adapt appropriate new technologies from other industries, and to introduce innovations into the airport industry. The need for ACRP was identified in *TRB Special Report 272: Airport Research Needs: Cooperative Solutions* in 2003, based on a study sponsored by the FAA. The Airport Cooperative Research Program (ACRP) was authorized in December 2003 as part of the Vision 100-Century of Aviation Reauthorization Act.

ACRP undertakes research, conducts other technical activities, and disseminates results in response to the needs of airport operators in a variety of airport subject areas involving administration, environment, legal, policy, planning, safety, human resources, design, construction, maintenance, and operations at airports.

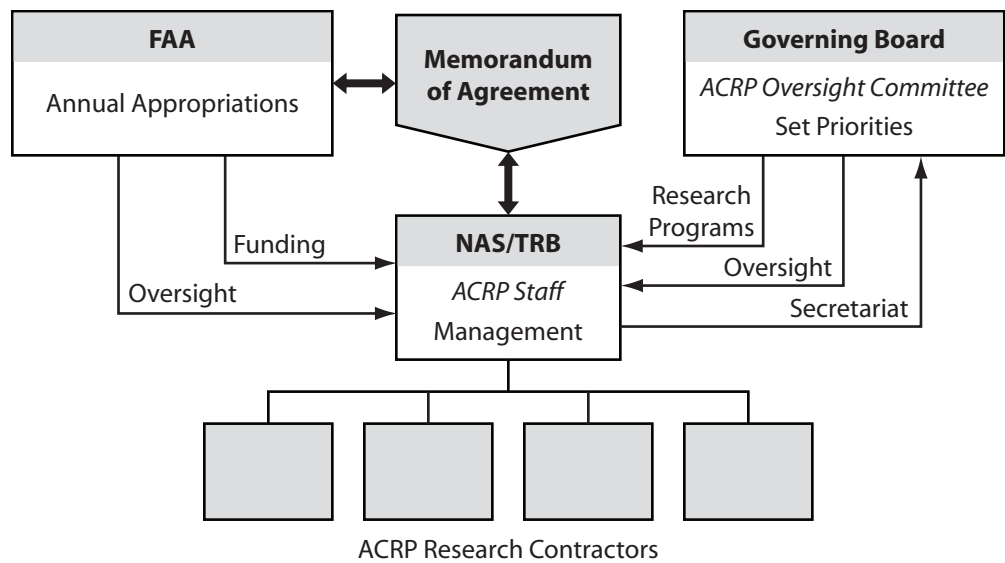
PROGRAM PARTICIPANTS

The primary participants in the ACRP are (1) an independent governing board, the ACRP Oversight Committee (AOC), appointed by the Secretary of the U.S. Department of Transportation with representation from airport operating agencies, other stakeholders, and relevant industry organizations such as the Airports Council International-North America (ACI-NA), the American Association of Airport Executives (AAAE), the Airport Consultants Council (ACC), the National Association of State Aviation Officials (NASAO), and the Air Trans-

port Association (ATA) as vital links to the airport community; (2) the TRB as program manager and secretariat for the governing board; and (3) the FAA as program sponsor. Figure 1 illustrates the ACRP organizational structure.

The ACRP benefits from the cooperation and participation of airport professionals, state and local government officials, airport planning and engineering professionals, equipment and service suppliers, air carriers, other airport users, and research organizations. Each of these participants has different interests and responsibilities, and each is an integral part of this cooperative research effort.

Figure 1. ACRP Organizational Structure



SELECTION OF RESEARCH

Research problem statements for the ACRP are solicited periodically but may be submitted to the TRB by anyone at any time. It is the responsibility of the AOC to formulate the research program by identifying the highest priority projects and defining funding levels and expected products.

PROGRAM MANAGEMENT

The ACRP is managed by the TRB using procedures modeled after those used in managing other cooperative research programs. Day-to-day program management includes the following tasks:

1. Assisting the AOC in identifying and prioritizing research needs;
2. Appointing and coordinating expert technical panels to guide research projects;
3. Developing and distributing Requests for Proposals;
4. Processing and evaluating proposals to select the best-qualified research agencies;
5. Executing contracts with the selected researchers;
6. Guiding the research;
7. Reviewing research reports;
8. Publishing and disseminating research reports; and
9. Promoting the application of research results.

PROJECT PANELS

Each ACRP project is assigned to a panel, appointed by the TRB; the panel provides technical guidance and counsel throughout the life of the project. Panels include experienced practitioners and research specialists; heavy emphasis is placed on including airport professionals, the intended users of the research products. The panels prepare Requests for Proposals and select contractors based on evaluation of the proposals received; the panels also guide the projects and review the reports. As in other TRB activities, ACRP project panel members serve voluntarily without compensation.

SELECTION OF CONTRACTORS

The process for selecting ACRP researchers has been used by the TRB in managing cooperative research programs for more than 45 years. This open process allows all potential research agencies to compete on the basis of technical merit and ensures that all proposers are treated fairly and that the program has access to the best talent available for each project. Proposals from potential research contractors are evaluated by the project panels. The evaluation considers the following: (1) the proposer's demonstrated understanding of the problem; (2) the merit of the proposed research approach and experiment design; (3) the experience, qualifications, and objectivity of the research team in the same or closely related areas; (4) the plan for promoting application of results; (5) the proposer's plan for involvement of disadvantaged business enterprises; and (6) the adequacy of the facilities.

FUNDING

The Vision 100-Century of Aviation Reauthorization Act authorized \$10 million per year for the ACRP in Fiscal Years (FY) 2004 through 2008. Given the timing of the approval of the Act vis-a-vis the FY 2004 appropriation process, no funds were appropriated for the program in FY 2004. ACRP funding of \$3 million was appropriated for FY 2005. In FY 2006, FY 2007, and FY 2008, \$10 million was appropriated for each. In FY 2009, FY 2010, and FY 2011, funding for the program was increased to \$15 million. Although FY 2012 is contingent upon the reauthorization of the Vision 100 legislation, which is under consideration as of this writing, the expectation is that \$15 million will be authorized and appropriated for the coming program year.

PRODUCTS

Primary emphasis is placed on disseminating ACRP results to the intended end-users of the research: airport operating agencies, service providers, and suppliers. The ACRP will produce a series of research reports for use by airport operators, local agencies, the FAA, and other interested parties, and industry associations may arrange for workshops, training aids, field visits, and other activities to ensure that results are implemented by airport-industry practitioners.

STATUS

The ACRP officially started in October 2005. A Memorandum of Agreement was executed by the FAA and the TRB, and the ACRP governing board was appointed by the Secretary of the U.S. Department of Transportation, according to the terms of the Memorandum of Agreement.

Some 115 statements of research need were assembled for consideration in formulating the ACRP agenda for Fiscal Years 2005 and 2006, and the governing board met on January 30 and 31, 2006, to establish operating procedures for the ACRP and to select FY 2005/2006 research projects. An additional 68 statements of research needs were received in the first half of 2006. The governing board met again on July 30 and 31, 2006, and on January 31, 2007, to select FY 2007 research projects.

During the first half of 2007, an additional 139 potential research topics, totaling over \$45 million in research needs, were received in response to an industry-wide solicitation of the airport community. The ACRP governing board met on July 22 and 23, 2007, and selected the FY 2008 research program from among the topics received.

In 2008, 147 potential research topics were received for consideration totaling over \$53 million. The ACRP governing board met on July 20 and 21, 2008, to select the FY 2009 research program from among these topics.

In 2009, a solicitation of research ideas from the airport industry yielded 219 potential topics totaling over \$77 million. The ACRP governing board met on July 19 and 20, 2009, to select the FY 2010 research program from among the topics received.

In 2010, 104 problem statements totaling more than \$38.7 million were received for consideration. On July 18 and 19, 2010, the ACRP governing board selected 24 projects for the FY 2011 research program.

In 2011, a solicitation of research ideas from the airport industry yielded 126 potential topics totaling over \$48 million. The ACRP governing board met on July 17 and 18, 2011, to select the FY 2012 research program from among the topics received.

To date, the AOC has authorized 256 projects, in a variety of subject areas of interest to the airport community. The AOC will meet in early 2012 to review progress.

See the section on ACRP Project Status.

Eleven research fields are used to classify ACRP research.

- Administration
- Environment
- Policy and Planning
- Safety
- Security
- Human Resources
- Design
- Construction
- Maintenance
- Operations
- Special Projects

The distribution of all projects and syntheses through December 2011 is shown in Table 1.

Table 1. Distribution of Projects and Syntheses by Research Field Through December 31, 2011

| Research Fields | Number of Projects | Number of Syntheses |
|------------------------|--------------------|---------------------|
| 1. Administration | 22 | 7 |
| 2. Environment | 42 | 9 |
| 3. Policy and Planning | 28 | 6 |
| 4. Safety | 15 | 9 |
| 5. Security | 1 | 1 |
| 6. Human Resources | 2 | 4 |
| 7. Design | 11 | 0 |
| 8. Construction | 1 | 1 |
| 9. Maintenance | 8 | 5 |
| 10. Operations | 15 | 9 |

Table 2 shows the origin of potential research topics (i.e., problem statements) submitted through the FY 2012 cycle. In addition, this table identifies the sources of the problem statements that have been selected by the ACRP governing board.

Table 2. Origin of Problem Statements

| Organization | FY2005/ 2006 | | FY2007/ 2008 | | FY 2009 | | FY 2010 | | FY 2011 | | FY 2012 | | Selected To Date (Thru FY 2012) | |
|---|-----------------|-------|-----------------|-------|---------|-------|---------|-------|---------|-------|---------|-------|---------------------------------------|-------|
| | NO. | % | NO. | % | NO. | % | NO. | % | NO. | % | NO. | % | NO. | % |
| Airport Operator | 23 | 20.0 | 25 | 12.1 | 29 | 19.7 | 27 | 12.3 | 12 | 11.5 | 35 | 27.8 | 30 | 20.0 |
| State DOT | 13 | 11.3 | 13 | 6.3 | 4 | 2.7 | 4 | 1.8 | 0 | 0 | 3 | 2.4 | 4 | 2.7 |
| FAA | 0 | 0.0 | 8 | 3.9 | 8 | 5.4 | 23 | 10.5 | 5 | 4.8 | 5 | 4.0 | 19 | 12.7 |
| Industry Associations Staff/Committee | 13 | 11.3 | 13 | 6.3 | 13 | 8.8 | 18 | 8.2 | 7 | 6.7 | 3 | 2.4 | 21 | 14.0 |
| Airlines/Airline Associations | – | – | – | – | – | – | – | – | 5 | 4.8 | 1 | 0.8 | 5 | 3.3 |
| TRB Committees | 1 | 0.9 | 6 | 2.9 | 6 | 4.1 | 9 | 4.1 | 5 | 4.8 | 4 | 3.2 | 12 | 8.0 |
| Industry | 1 | 0.9 | 29 | 14.0 | 19 | 12.9 | 9 | 4.1 | 7 | 6.7 | 10 | 7.9 | 10 | 6.7 |
| University | 30 | 26.1 | 37 | 17.9 | 30 | 20.4 | 47 | 21.5 | 12 | 11.5 | 9 | 7.1 | 13 | 8.7 |
| Consultant | 29 | 25.2 | 56 | 27.1 | 37 | 25.2 | 80 | 36.5 | 50 | 48.1 | 53 | 42.1 | 27 | 18.0 |
| Other | 5 | 4.3 | 20 | 9.7 | 1 | 0.7 | 2 | 0.9 | 1 | 1.0 | 3 | 2.4 | 9 | 6.0 |
| Totals | 115 | 100.0 | 207 | 100.0 | 147 | 100.0 | 219 | 100.0 | 104 | 100.0 | 126 | 100.0 | 150 | 100.0 |

Table 3 displays project panel composition by affiliation, race, and gender through the FY 2012 research program. Over 621 individuals from the airport industry are volunteering their time and effort to participate in the ACRP. This industry participation helps to ensure that the research products are useful to airport industry practitioners.

Table 3. Panel Composition of Active Projects

(114 Project Panels, 723 Seats)

| Demographics | No. | % |
|-------------------------------------|----------------|----------------|
| Affiliation | | |
| Airline | 29 | 4.7 |
| Airport Operator | 236 | 38.0 |
| State Gov't | 27 | 4.3 |
| Local Gov't/MPO/Transit | 32 | 5.2 |
| Federal Gov't | 10 | 1.6 |
| Industry/Consultants/Private Sector | 231 | 37.2 |
| University | 34 | 5.5 |
| Association | 22 | 3.5 |
| Race | | |
| | Members/Chairs | Members/Chairs |
| White | 455/88 | 74.22/88.8 |
| Minorities | 158/118 | 25.7/11.1 |
| Gender | | |
| | Members/Chairs | Members/Chairs |
| Male | 451/65 | 73.7/65.7 |
| Female | 161/34 | 26.3/34.3 |

During 2011, 35 ACRP publications were released. These publications include 20 in the ACRP Report series, 10 in the Synthesis of Practice series, 2 in the Legal Research Digest series, 1 in the Research Results Digest series, and 2 in the Web-Only Document series. Table 4 provides a listing of all currently available ACRP publications as of December 31, 2011.

DISSEMINATING RESULTS

The unique makeup of the airport industry has several industry associations representing diverse audiences, i.e., specific subgroups of airport-practitioners. The job of disseminating ACRP research results to specific airport-practitioner audiences and simultaneously using this contact to assess the value and utility of ACRP results is complex and requires a diverse and simultaneous set of activities.

In the past year the ACRP Oversight Committee has discussed and approved a variety of dissemination activities and considers it a continuing priority to reach a broad array of airport-practitioners and evaluate our contribution to the airport industry. Essentially, ACRP must employ a coordinated strategy that can collectively and affordably reach as many of the diverse airport industry groups as is practical.

DOCUMENTING SUCCESS

The goal of ACRP is to provide well-researched, useful publications that can contribute to the growth and development of the nation's airport industry. ACRP's Impacts on Practice series is designed to provide examples of how airport industry practitioners are using ACRP research results to assist them in their work.

Three Impacts on Practice are included in this report:

- *Protecting Airport Personnel from Lightning Strikes (ACRP Report 8)*
- *Estimating Airport Greenhouse Gas (GHG) Emissions (ACRP Report 11)*
- *Traumatic Event Assistance for Aviation Employees (ACRP Report 22)*

The following ACRP activities of particular interest were completed during 2011. Table 5 provides a summary of all ACRP research projects selected, along with their status as of December 31, 2011.

Environmental Issues

ACRP Report 46: Handbook for Analyzing the Costs and Benefits of Alternative Aviation Turbine Engine Fuels at Airports consists of the Alternative Fuel Investigation Tool (AFIT), a handbook on the use of AFIT, and a report on its development. AFIT is an analytical model designed to help airport operators and fuel suppliers evaluate the costs associated with introducing “drop-in” alternative turbine engine fuel at airports and the benefits as measured by reduced emissions. AFIT, which is included in CD-ROM format with the print version of the report, takes into account options for using alternative fuel for other airside equipment, including diesel-powered ground support equipment. The report also addresses characteristics of current fuel usage and distribution, and describes what is required to switch to alternatives.

ACRP Synthesis 24: Strategies and Financing Opportunities for Airport Environmental Programs summarizes public and private funding opportunities and strategies available to airports to help accomplish their environmental programs and objectives.

Safety Issues

ACRP Report 43: Guidebook of Practices for Improving Environmental Performance at Small Airports outlines federal environmental regulations and requirements, and identifies activities in which airport operators can be proactive in promoting environmental stewardship. As a quick reference, summary graphics

provide information pertaining to the cost and savings as well as the necessary knowledge and amount of time to implement a particular activity. In addition, there are five case studies that discuss environmental initiatives already undertaken at airports that can serve as a guide for other airports. The report includes the collection of environmental stewardship practices in a searchable, filterable spreadsheet format on a CD-ROM, which is packaged with the report.

ACRP Report 45: Optimizing the Use of Aircraft Deicing and Anti-Icing Fluids provides guidance on procedures and technologies designed to help reduce the use of aircraft deicing and anti-icing fluids (ADAF) while maintaining safe aircraft operations across the wide range of winter weather conditions found in the United States and Canada. The report includes a series of best management practices that have the potential to be immediately implemented, and highlights the detailed findings and recommendations of experiments to evaluate holdover time determination systems, spot deicing for aircraft frost removal, and ADAF dilutions.

ACRP Report 50: Improved Models for Risk Assessment of Runway Safety Areas analyzes aircraft veer-offs, the use of declared distances, the implementation of the Engineered Material Arresting System (EMAS), and the incorporation of a risk approach for consideration of obstacles on or in the vicinity of the runway safety area (RSA). An interactive risk analysis tool, included in CD-ROM format with the printed version of the report, is designed to be used by airport and industry stakeholders to quantify risk and support planning and engineering decisions when determining RSA requirements to meet an acceptable level of safety for various types and sizes of airports.

ACRP Report 51: Risk Assessment Method to Support Modification of Airfield Separation Standards is intended to be used to support requests for modification of standards in those circumstances where the design criteria for separations between taxiways/taxilanes and other taxiways/taxilanes and fixed or movable objects as well as separations between taxiways and runways cannot be met.

ACRP Synthesis 23: Bird Harassment, Repellent, and Deterrent Techniques for Use on and Near Airports reviews techniques for reducing bird collisions with aircraft and the relative effectiveness of the various techniques.

Economic Issues

ACRP Report 44: A Guidebook for the Preservation of Public-Use Airports describes why public-use airports close and identifies measures and strategies that can be undertaken to potentially help preserve and prevent an airport closure. The guidebook presents step-by-step procedures on how to identify risk

factors that can increase the potential of a future airport closure and how to formulate an effective airport preservation program. The guidebook also identifies potential groups interested in preserving public-use airports and offers practical checklists for identifying and addressing issues as part of a comprehensive strategic airport planning program in support of preservation efforts.

ACRP Report 47: Guidebook for Developing and Leasing Airport Property explores issues associated with developing and leasing available airport land and summarizes best practices from the perspective of the airport sponsor. The guidebook includes a diverse set of case studies that show several approaches airports have taken to develop and lease property for both aeronautical uses and non-aeronautical uses. The project that developed the guidebook also produced two presentation templates designed to help airports in effective stakeholder communication regarding developing and leasing airport property. The templates, designed for a non-technical audience, provide content, examples, and definitions for a presentation to community stakeholders. The templates, one for aeronautical use development presentations and the second for non-aeronautical use development presentations, are available only online.

ACRP Report 48: Impact of Jet Fuel Price Uncertainty on Airport Planning and Development is designed to help airport operators and planners measure the impact of changes in jet fuel price on supply and demand for air service at commercial service airports. The report includes background research; a computer model, available online and in CD ROM format attached to the printed version of the report; and a user manual. The output of the model can ultimately be used to help evaluate the impact of uncertainty on airport development and finance. Applying specific input parameters, the model, embedded in a user-friendly program, allows airport planners and managers to assess how fuel, economic, and other uncertainties may affect their particular airport and to test the sensitivity of varying assumptions about key drivers of airport activity. The supporting research examines historical changes in fuel prices in the context of changing economic conditions and uses this experience to assess risk in adhering to existing air traffic forecasts when planning future airport improvements or expansion. The model illustrates risk using confidence bands that indicate a range of forecasts as a function of changing jet fuel prices and other factors. The research also examines the historic link between changes in jet fuel prices in relation to periodic occurrence of recessions and how changing demand may, in turn, result in changes in fleet composition and size.

ACRP Report 49: Collaborative Airport Capital Planning Handbook provides guidance to those in the airport community who have responsibility for, and a stake in, developing, financing, managing, and overseeing an airport capital plan and the individual projects included in it. The handbook provides guidance on appropriate performers for each task in the collaborative planning process,

and defines and describes the different ways to communicate to help ensure effective exchanges between internal and external stakeholders.

Airport Performance Issues

ACRP Report 19A: Resource Guide to Airport Performance Indicators explores airport performance indicators (APIs) for use in benchmarking and performance measurement. These APIs are sorted by functional type and their criticality to the airport strategic plan. More than 800 performance indicators are presented in three main categories: Core, Key, and Other APIs. “Core” or fundamental indicators are important for overall operation of the airport and of interest to the Chief Executive Officer or governing board. “Key” or departmental indicators are important for the operations of key airport functions and departments. The remaining “Other” indicators are considered useful as secondary departmental unit performance indicators but not critical to the airport’s overall function.

ACRP Report 33: Guidebook for Developing and Managing Airport Contracts is a guidebook of best practices for developing, soliciting, and managing airport agreements and contracts for use by a variety of airports. The agreements referenced in this guidebook range from airline-related agreements to communication and utility service as well as common-use, ground transportation, and concessions agreements for a variety of passenger services. An accompanying CD-ROM provides sample agreements in each of these areas.

ACRP Report 41: Guide to the Decision-Making Tool for Evaluating Passenger Self-Tagging provides the information and tools, included on an accompanying CD-ROM, necessary for an airport or airline to determine the appropriateness of pursuing passenger self-tagging should it be allowed in the United States in the future. The tools, in an Excel spreadsheet format, allow for the input of airport-specific information, such as facility size and passenger flows, while also providing industry averages to assist those airports and airlines that haven’t yet collected their individual information. The decision-making tools provide both qualitative and quantitative information that can then be used to assess if passenger self-tagging meets organizational needs or fits into their strategic plan.

ACRP Report 42: Sustainable Airport Construction Practices explores a set of best practices, methods, procedures, and materials that if implemented during construction may have a sustainable, positive economic, operational, environmental, or social effect. The report includes the collection of sustainable airport construction practices in a searchable, filterable spreadsheet format on a CD-ROM, which is packaged with the report.

ACRP Synthesis Report 22: Common Airport Pavement Maintenance Practices explores how airports implement a pavement maintenance management program, including inspecting and tracking pavement condition, scheduling maintenance, identifying necessary funds, and treating distresses in asphalt and concrete pavements.

Other Airport Issues

ACRP Web-Only Document 12: Risk Assessment of Proposed ARFF Standards explores air carrier passenger aircraft accidents to help determine if changes to Aircraft Rescue and Fire Fighting (ARFF) standards would have reduced the number of fatalities or serious injuries that resulted from past accidents. The report compares standards set forth by the FAA in 14 Code of Federal Regulations (CFR), Part 139, Certification of Airports with the standards of the International Civil Aviation Organization in Annex 14 and standards set forth by the National Fire Protection Association in making determinations of reducing the number of fatalities and serious injuries associated with each accident. In the United States, ARFF is only required at airports subject to 14 CFR Part 139 and may not exist at non-Part 139 airports including general aviation airports. Generally, airports serving scheduled air carrier passenger operations with more than nine passenger seats and unscheduled air carrier passenger service with more than 30 seats are required to have a Part 139 certificate.

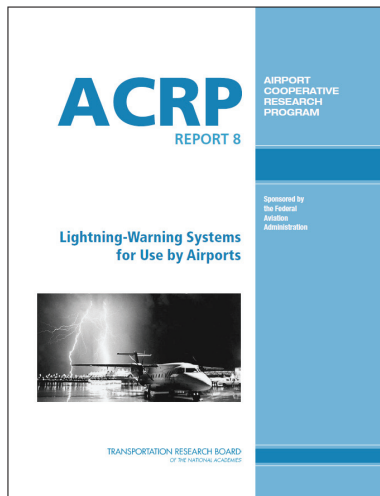
Protecting Airport Personnel from Lightning Strikes

Lightning strikes are particularly hazardous to ramp operations at airports, where ramp workers need to cease outdoor activities when lightning presents an imminent danger. All aspects of airport operations—landside, terminal, and airside—are impacted when there is a ramp closure. *ACRP Report 8: Lightning-Warning Systems for Use by Airports* (2008) provides detailed information about lightning detection and warning systems, which includes the ability for airports to measure the operational benefits available from the systems meant to ensure the safety of personnel and minimize disruptions to airport operations.

A variety of detection technologies exist for determining when lightning occurs. Many detectors are based on radio frequency with varying levels of sophistication, accuracy, and cost. Other systems incorporate the measurement of electric or magnetic fields to detect the presence of lightning. The prediction of lightning can also be a component of a comprehensive lightning warning system. While detection simply states the current or past occurrences of lightning, predictive methodologies attempt to determine where lightning is likely to strike next. Two approaches are utilized for lightning prediction through monitoring the buildup of atmospheric electric fields in response to charged clouds and monitoring the growth and movement of systems that develop into thunderstorms.

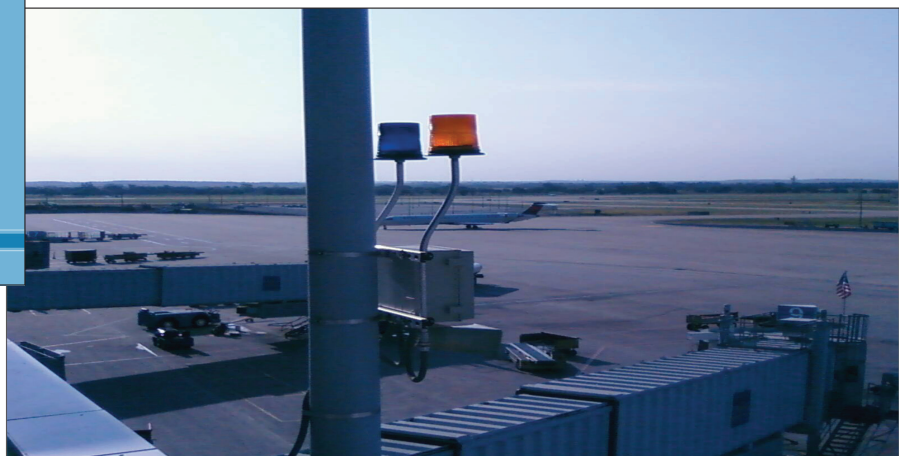
Lightning strikes pose a risk to aviation activities in the Austin, Texas, area which has led officials at Austin-

Bergstrom International Airport (AUS) to establish procedures for notifying workers and suspending outdoor actions. AUS utilizes an on-site national weather service (NWS) that provides lightning reports with a phone call when lightning strikes within 8 miles of the airport and then again when lightning strikes within 5 miles of the airport, when an auditory warning is signaled and notifications are sent to pagers. At this warning, the apron is closed for refueling operations due to the risk posed by the nearby lightning. However, ramp workers were sometimes unaware of the auditory warning due to aircraft noise or because they were wearing hearing protection. To ensure that staff received the auditory warning, airport personnel drove to each gate, or called airline operations offices to alert those who hadn't heard the warning. Airlines at the airport had requested an improved warning system to eliminate the need for manual warnings and provide a more complete warning.



Right:
Visual warning system installed
at Austin-Bergstrom International
Airport (AUS).

Photo courtesy of AUS Airport.



continued on page 2

In response to the airline request, AUS officials identified and selected a visual alerting system. Phillip Bays, Information Security Analyst at AUS, states that *ACRP Report 8* was “instrumental in presenting various alternatives for lightning warning systems that ultimately led to the selection and installation of strobe lights.” *ACRP Report 8* provided detailed information on a range of warning systems and considerations for selecting a system for AUS.

To complement the audible system, strobe lights were installed on the roof of the terminal building at every third gate where each alert could be seen by operators at several gates. The alert is activated by the airport’s communications office through the security system software, which minimized costs through integration with the existing system. The airport is considering expanding the system to buildings outside of the primary terminal area to provide notification to areas that currently require a phone call. The alerts were installed in March 2011 and are tested each week to ensure they are operating as designed. The system is relatively inexpensive and Bays notes that the new warning system offered significant long-term savings as compared to the previous method of sending airport personnel to each gate.

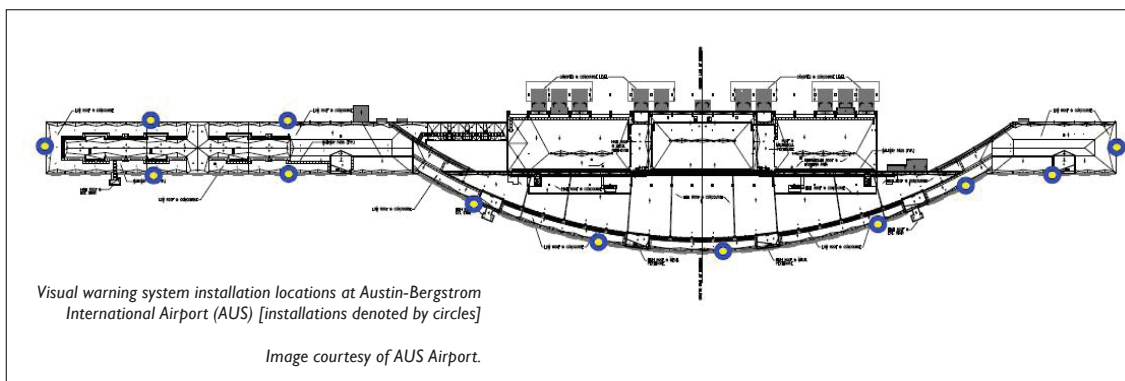
ACRP Report 8 includes information to enable a benefit-cost analysis to assess which systems are most appropriate for a particular airport or airline. A cost benefit analysis of lightning warning systems will include the effects of ramp closures (which negatively impact operations and introduce costs by suspending passenger enplanements and deplanements), baggage loading and unloading, aircraft servicing (fuel, food, etc.), connecting or disconnecting aircraft to ground power, and gate movements. The duration of lightning-related delays affect these activities to varying degrees. Passengers are affected by any delay, while the direct cost to an airline increases significantly between a short and long delay. The system wide impacts of delay also are most pronounced with longer delays because short delays can be absorbed into the system, while long duration delays can cause en route delays.

ACRP Report 8 provides a practical guide for airport lightning detection and warning systems that improve ramp worker safety while minimizing the number and duration of ramp closures. *ACRP Report 8* also provides an outlook on future developments and improvements that can assist lighting detection and warning. The potential information available through NextGen system improvements, better meteorological

“Ramp safety is essential for all airports. All commercial airports with scheduled operations in lightning-prone areas should have lightning detection and warning systems to alert managers and ramp personnel of approaching hazards.”

ACRP Report 8: Lightning-Warning Systems for Use by Airports

data, and refined warning algorithms and criteria through self-monitoring software all offer enhancements for the future of lightning detection and warning.



ACKNOWLEDGMENT OF SPONSORSHIP: This work was sponsored by the Federal Aviation Administration and was conducted in the Airport Cooperative Research Program, which is administered by the Transportation Research Board of the National Academies.

DISCLAIMER: The opinions and conclusions expressed or implied in ACRP publications are those of the research agencies. They are not necessarily those of the Transportation Research Board, the National Research Council, or the program sponsors.

Estimating Airport Greenhouse Gas (GHG) Emissions

Local political and community interest in environmental impacts, specifically greenhouse gas (GHG) emissions, are a growing concern for municipalities across the country. These concerns have led to the desire to estimate the contribution of local sources to GHG emissions. *ACRP Report 11: Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories* (2009) was developed to assist airport operators

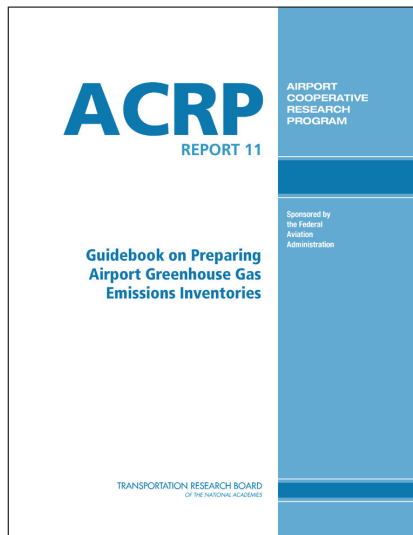
and others with generating airport-specific GHG emission inventories. The guidebook provides a framework for identifying and quantifying specific components of airport contributions to GHG emissions.

Various reasons exist for why a GHG emission inventory should be developed including: 1) climate change initiatives, 2) environmental management and sustainability programs, 3) disclosure of project effects, and 4) future regulations. GHG emissions can be derived from many sources (aircraft, parking facilities and roadways, generators, boilers, heaters, etc.) and activities (parking, maintenance, construction, etc.) at an airport. Ownership or influence of the emissions (airport operator, tenants, public, etc.) are important to consider

as part of an inventory, as well as the geographic components of GHG emissions.

Ultimately, the procedures for developing a GHG emissions inventory rely on data, which may or may not be available at a given airport. To account for numerous data sources and formats, the guidebook provides a preferred approach and alternative quantification approaches for emissions sources. This flexibility allows airports to establish a more complete estimate of emissions even when the preferred methodology cannot be applied.

For instance, when considering the impacts of ground access vehicles at an airport, users are provided three alternatives with varying data requirements, from an average mileage usage applied to an average emissions factor to a vehicle-specific mileage usage combined with vehicle-specific modeled emissions factor. The preferred method is the most complex method with vehicle-specific usage and modeled emissions data, but the guidebook realizes the limitations presented by data availability and recommends that users apply the most complex method possible given the available data. These well-defined methodologies also allow users to determine which data they would like to collect in the future to provide more accurate estimates of GHG emissions, while considering limited budgets for data collection, control over the multiple types of emissions, and the impact of potential mitigation strategies.



Right: Kris Russell in front of boilers at Dallas/Fort Worth International Airport (DFW) that were included as direct emissions sources in the calculation of GHG emissions at the airport.

Photo courtesy of DFW Airport.



continued on page 2

Officials at the Dallas/Fort Worth International Airport (DFW) have used the guidebook to develop a GHG emissions inventory for the airport. Kris Russell, Senior Environmental Analyst at DFW, first learned about the ACRP project at an Air Quality Conference in 2008 sponsored by the American Association of Airport Executives (AAAE). Following the conference, Russell developed a GHG emissions inventory for the airport which considered direct emission sources, indirect sources, and some optional sources. Direct emissions are generated by airport operator-owned vehicles and facilities. Indirect emissions are emissions from plants that generate power purchased by an airport. Optional emissions can include tenant activities (such as aircraft emissions), public ground transportation, and employee commuting.

Russell noted, “The guidebook was useful for applying the concepts and details necessary for developing spreadsheets to calculate the emissions at our airport.” He added, “Additionally, the flexibility available through the alternative estimation techniques made the guidebook practical since we could apply the data we had available.” The options presented in the guidebook allow users to select an acceptable method based on available resources and information.

ACRP Report 11 provides a consistent methodology that can allow for comparisons between airports and help airport owners communicate the current GHG emissions status and the impacts of potential mitigation techniques to local communities and other stakeholders. Users of the inventory procedures can track GHG emissions over time or examine the

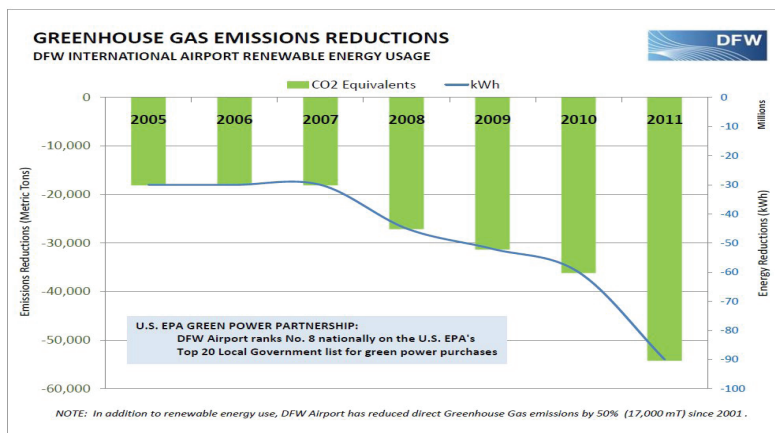
likely effects of operations which might impact GHG emissions.

For DFW, Russell also applied the methodology from ACRP Report 11 to estimate the emissions reductions from acquiring renewable wind energy sources in their electricity contract; these renewable sources have grown to 30% of the facility’s electricity usage since 2005. Reductions can be easily graphed to quickly convey the return on the investment in a technology or alternative energy source over time. This quantification of benefits helps airport management and boards make wise investment decisions and supports collaboration with other entities, such as state or regional transportation agencies, that are working to reduce GHG emissions.

At DFW, staff conducted the emissions inventory and analysis, without the need for outside assistance. However, if in-house resources are not available, ACRP Report 11 offers valuable information for developing proposal requests for hiring consultants to perform the work, ensuring a consistent methodology is applied.

“Given the level of interest regarding aviation’s contribution to GHG emissions and ultimately to climate change, it is important that airports have information necessary to address potential concerns. This guidebook provides a concise set of step-by-step instructions on how to generate airport GHG inventories.”

ACRP Report 11: Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories



ACKNOWLEDGMENT OF SPONSORSHIP: This work was sponsored by the Federal Aviation Administration and was conducted in the Airport Cooperative Research Program, which is administered by the Transportation Research Board of the National Academies.

DISCLAIMER: The opinions and conclusions expressed or implied in ACRP publications are those of the research agencies. They are not necessarily those of the Transportation Research Board, the National Research Council, or the program sponsors.

Traumatic Event Assistance for Aviation Employees

Aircraft collisions, aviation-related terrorism actions, or natural disasters that influence airport operations can result in traumatic experiences for airport and air carrier employees. To help with the psychological health of employees and the eventual return to normal operations, airport management and

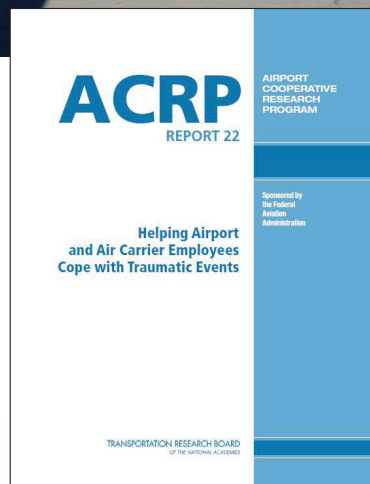
administrative staff can benefit from an enhanced knowledge of appropriate responses to traumatic events. *ACRP Report 22: Helping Airport and Air Carrier Employees Cope with Traumatic Events* (2009) is a resource manual to assist with trauma experienced by those involved in a disaster. *ACRP Report 22* provides fundamental aspects

of traumas and practical guidance for addressing emotional and psychological effects due to involvement in a traumatic incident. Anyone involved in the well-being of employees could further promote staff welfare before, during, and after traumatic incidents from the principles and strategies presented in *ACRP Report 22*. Advanced planning for response to these events will help management recognize symptoms, mitigate emotional impacts, and direct services to those in need.



Above:
Site of March 29,
2001 crash at
Aspen-Pitkin County
Airport (ASE).

Photo courtesy of
Hilary Fletcher.



Traumatic events can have a severe effect on the individuals involved, as well as impacts to the operations of the airport and organization. Prior planning within an organization for such events can improve human resiliency, a person's ability to return to their job tasks after a psychological obstacle. To minimize the impacts to operations and business productivity, human resiliency should be promoted in preparation for a disastrous event. *ACRP Report 22* describes a variety of strategies to improve human resiliency and help employees cope with a traumatic event. Training for first-response activities is common, but generally do not include recovery training activities identified in *ACRP Report 22*.

One example of an effective program draws from the post-event response to a chartered flight that crashed on the final approach at Aspen-Pitkin County Airport (ASE) in Aspen, Colorado, on March 29, 2001. All 18 people on board the aircraft were killed. More information about this traumatic event and the response that followed is available in

continued on page 2

ACRP Report 22 as a case study. Hilary Fletcher was County Manager for Pitkin County at the time of the crash and was instrumental in the effort responding to the crash. *ACRP Report 22* highlights the successful leadership, communication, and continuity of care in response to the crash.

To help communities in Colorado recover from aviation incidents, Fletcher founded the Colorado Aviation Recovery Support Team (CARST). CARST team members include airport, aviation, and public safety professionals who have a detailed knowledge of the National Incident Command System and a minimum ICS-400 standards certification. CARST’s mission is to provide mentoring, support, and guidance to assist a community’s recovery efforts after a traumatic aviation event. CARST is able to provide their services at no cost to the local community through support from the Colorado Division of Aeronautics, Colorado Aeronautical Board, Colorado Airport Operators Association, and the participants on the team and their respective organizations.

According to Fletcher, *ACRP Report 22* “provides critical information for helping employees cope with traumatic events.” *ACRP Report 22* provided affirmation of the effort in response to the 2001 crash and was a fundamental building block for the formation of CARST. In *ACRP Report 22*, Fletcher found the five essential mental health intervention principles resulting from disasters developed by Hobfoll et al. (2007)¹ to be particularly useful. The five principles include:

1. Promoting a sense of SAFETY to reduce negative post-trauma reactions.
2. Promoting a sense of CALMNESS to reduce dysfunctions in sleep, concentration, and decision making; unrealistic perceptions of dangerousness; and avoidance.

3. Promoting a sense of SELF-EFFICACY or the sense that a person’s actions are likely to lead to a positive or desired outcome to ensure a sense of competency, normalize emotions, and solve problems.
4. Promoting CONNECTEDNESS to support information sharing, problem solving, normalization, and emotional support.
5. Instilling HOPE by emphasizing individual and organizational strength, decreasing exaggeration of personal responsibility for causing the event, and stressing that most people recover on their own.

ACRP Report 22 also provides extensive recommendations for actions to help employees cope with traumatic events, before, during, and after they occur. A model for a mental health recovery plan is provided, which guides an organization through establishing and customizing a mental health recovery plan and incorporating it into their existing emergency planning exercises. The development of Mental Health Recovery training plans include:

1. Planning and preparedness.
2. Developing and deploying mitigation strategies.
3. Response to the incident.
4. Recovery phase, and
5. Evaluation of the plan.

¹Hobfoll, S.E. et al. (2007). *Five essential elements of immediate and mid-term mass trauma intervention: Empirical evidence. Psychiatry: Interpersonal and Biological Processes*, 70:283–315.

“It has been found through several studies dealing with various traumatic events, that the mental health considerations of an organization’s employees are crucial during the recovery from a traumatic event, and for the continued well-being of an employee.”

ACRP Report 22: Helping Airport and Air Carrier Employees Cope with Traumatic Events

ACKNOWLEDGMENT OF SPONSORSHIP: This work was sponsored by the Federal Aviation Administration and was conducted in the Airport Cooperative Research Program, which is administered by the Transportation Research Board of the National Academies.

DISCLAIMER: The opinions and conclusions expressed or implied in ACRP publications are those of the research agencies. They are not necessarily those of the Transportation Research Board, the National Research Council, or the program sponsors.

TABLE 4. Publications of the Airport Cooperative Research Program

| Reports | | |
|----------------|------------------|---|
| No. | Proj. No. | Title, Pages, Publication Year |
| 1 | 11-02/Task 04 | Safety Management Systems for Airports, Vol. 1: Overview, 40 p. (2007) |
| 1 | 04-05 | Safety Management Systems for Airports, Vol. 2: Guidebook, 174 p. (2009) |
| 2 | 11-02/Task 03 | Evaluation and Mitigation of Aircraft Slide Evacuation Injuries, 86 p. (2008) |
| 3 | 04-01 | Analysis of Aircraft Overruns and Undershoots for Runway Safety Areas, 58 p. (2008) |
| 4 | 11-02/Task 02 | Ground Access to Major Airports by Public Transportation, 214 p. (2008) |
| 5 | 11-02/Task 05 | Quarantine Facilities for Arriving Air Travelers: Identification of Planning Needs and Costs, 34 p. (2008) |
| 6 | 02-04 | Research Needs Associated with Particulate Emissions at Airports, 64 p. (2008) |
| 7 | 02-03 | Aircraft and Airport-Related Hazardous Air Pollutants: Research Needs and Analysis, 64 p. (2008) |
| 8 | 04-02 | Lightning-Warning Systems for Use by Airports, 80 p. (2008) |
| 9 | 02-04A | Summarizing and Interpreting Aircraft Gaseous and Particulate Emissions Data, 90 p. (2008) |
| 10 | 07-01 | Innovations for Airport Terminal Facilities, 78 p. (2008) |
| 11 | 02-06 | Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories (& WOD 2), 62 p. (2009) |
| 12 | 05-01 | An Airport Guide for Regional Emergency Planning for CBRNE Events, 52 p. (2009) |
| 13 | 01-03 | Integrating Airport Information Systems, 98 p. (2009) |
| 14 | 02-02 | Deicing Planning Guidelines and Practices for Stormwater Management Systems, 208 p. (2009) |
| 15 | 02-05 | Aircraft Noise: A Toolkit for Managing Community Expectations (& CD 70), 162 p. (2009) |
| 16 | 01-01 | Guidebook for Managing Small Airports (& WOD 5), 140 p. (2009) |
| 17 | 10-04 | Airports and the Newest Generation of General Aviation Aircraft, Vol. 1: Forecast, 36 p. (2009) |
| 17 | 10-04 | Airports and the Newest Generation of General Aviation Aircraft, Vol. 2: Guidebook, 124 p. (2009) |
| 18 | 03-08 | Passenger Air Service Development Techniques, 168 p. (2009) |
| 19 | 01-06 | Developing an Airport Performance Measuring System (& CD 79), 154 p. (2010) |
| 19A | 01-09 | Resource Guide to Airport Performance Indicators (& CD 94), 288 p. (2011) |
| 20 | 03-09 | Strategic Planning in the Airport Industry (& CD 73), 136 p. (2009) |
| 21 | 01-05 | A Guidebook for Selecting Airport Capital Project Delivery Methods, 100 p. (2009) |
| 22 | 06-01 | Helping Airport and Air Carrier Employees Cope with Traumatic Events, 82 p. (2009) |
| 23 | 03-02 | Airport Passenger-Related Processing Rates Guidebook, 126 p. (2009) |
| 24 | 10-03 | Guidebook for Evaluating Airport Parking Strategies and Supporting Technologies, 162 p. (2009) |
| 25 | 07-05 | Airport Passenger Terminal Planning and Design, Vol. 1: Guidebook, 426 p. (2010) |
| 25 | 07-04 | Airport Passenger Terminal Planning and Design, Vol. 2: Spreadsheet Models and User's Guide (& CD 75), 82 p. (2010) |
| 26 | 03-04 | Guidebook for Conducting Airport Users Surveys, 256 p. (2009) |
| 27 | 03-03 | Enhancing Airport Land Use Compatibility, Vol. 1: Land Use Fundamentals and Implementation Resources, 316 p. (2010) |
| 27 | 03-03 | Enhancing Airport Land Use Compatibility, Vol. 2: Land Use Survey and Case Study Summaries, 296 p. (2010) |
| 28 | 01-04 | Marketing Guidebook for Small Airports, 196 p. (2010) |
| 29 | 07-03 | Developing Improved Civil Aircraft Arresting Systems, 206 p. (2010) |
| 30 | 10-05 | Reference Guide on Understanding Common Use at Airports (& CD 74), 244 p. (2010) |
| 31 | 03-10 | Innovative Approaches to Addressing Aviation Capacity Issues in Coastal Mega-regions, 178 p. (2010) |
| 32 | 04-06 | Guidebook for Addressing Aircraft/Wildlife Hazards at General Aviation Airports, 192 p. (2010) |
| 33 | 01-02 | Guidebook for Developing and Managing Airport Contracts (& CD 81), 82 p. (2011) |
| 34 | 10-06 | Handbook to Assess the Impacts of Constrained Parking at Airports (& CD 80), 112 p. (2010) |
| 35 | 10-02 | Planning for Offsite Airport Terminals, 94 p. (2010) |
| 36 | 01-07 | Airport/Airline Agreements--Practices and Characteristics, 112 p. (2010) |

Table 4 (continued)

| Reports | | |
|---------------------------------|------------------|---|
| No. | Proj. No. | Title, Pages, Publication Year |
| 37 | 03-06 | Guidebook for Planning and Implementing Automated People Mover Systems at Airports (& CD 82), 226 p. (2010) |
| 38 | 03-13 | Understanding Airspace, Objects, and Their Effects on Airports, 164 p. (2010) |
| 39 | 09-01 | Recommended Guidelines for the Collection and Use of Geospatially Referenced Data for Airfield Pavement Management, 108 p. (2010) |
| 40 | 07-02 | Airport Curbside and Terminal Area Roadway Operations, 40 p. (2010) |
| 41 | 10-07 | Guide to the Decision-Making Tool for Evaluating Passenger Self-Tagging (& CD 83; & WOD 10), 70 p. (2011) |
| 42 | 08-01 | Sustainable Airport Construction Practices (& CD 88), 320 p. (2011) |
| 43 | 02-13 | Guidebook of Practices for Improving Environmental Performance at Small Airports (& CD 89), 364 p. (2011) |
| 44 | 03-11 | A Guidebook for the Preservation of Public-Use Airports (& CD 102), 62 p. (2011) |
| 45 | 10-01 | Optimizing the Use of Aircraft Deicing and Anti-Icing Fluids, 180 p. (2011) |
| 46 | 02-07 | Handbook for Analyzing the Costs and Benefits of Alternative Aviation Turbine Engine Fuels at Airports (& CD 91), 78 p. (2011) |
| 47 | 01-08 | Guidebook for Developing and Leasing Airport Property, 140 p. (2011) |
| 48 | 03-15 | Impact of Jet Fuel Price Uncertainty on Airport Planning and Development (& CD 93), 72 p. (2011) |
| 49 | 01-10 | Collaborative Airport Capital Planning Handbook, 136 p. (2011) |
| 50 | 04-08 | Improved Models for Risk Assessment of Runway Safety Areas (& CD 98), 182 p. (2011) |
| 51 | 04-09 | Risk Assessment Method to Support Modification of Airfield Separation Standards, 136 p. (2011) |
| 52 | 07-06 | Wayfinding and Signing Guidelines for Airport Terminals and Landside, 252 p. (2011) |
| 53 | 02-11 | A Handbook for Addressing Water Resource Issues Affecting Airport Development Planning, 170 p. (2011) |
| 54 | 01-11 | Resource Manual for Airport In-Terminal Concessions, 268 p. (2011) |
| 55 | 03-05 | Passenger Level of Service and Spatial Planning for Airport Terminals, 70 p. (2011) |
| 56 | 02-10 | Handbook for Considering Practical Greenhouse Gas Emission Reduction Strategies for Airports (& CD 95), 150 p. (2011) |
| 57 | 11-02/Task 18 | The Carbon Market: A Primer for Airports, 80 p. (2011) |
| 58 | 11-02/Task 15 | Airport Industry Familiarization and Training for Part-Time Airport Policy Makers, 64 p. (2011) |
| Research Results Digests | | |
| No. | Proj. No. | Title, Pages, Publication Year |
| 1 | 11-03 | Synthesis of Information Related to Airport Practices, 4 p. (2007) |
| 2 | 11-02/Task 01 | Model for Improving Energy Use in U.S. Airport Facilities, 20 p. (2007) |
| 3 | 11-03 | Synthesis of Information Related to Airport Practices, 4 p. (2007) |
| 4 | 11-03 | Synthesis of Information Related to Airport Practices, 4 p. (2009) |
| 5 | 11-02/Task 07 | Current and Emerging Issues Facing the Airport Industry, 32 p. (2009) |
| 6 | 04-03 | Guidance for Identifying and Mitigating Approach Lighting System Hazards, 16 p. (2009) |
| 7 | 11-02/Task 11 | A Summary of How Proposed Firefighting Standards Would Impact Airports, 20 p. (2009) |
| 8 | 11-03 | Synthesis of Information Related to Airport Practices, 4 p. (2010) |
| 9 | 02-01 | Alternative Aircraft and Pavement Deicers and Anti-Icing Formulations with Improved Environmental Characteristics, 12 p. (2010) |
| 10 | 03-01 | Light Detection and Ranging (LIDAR) Deployment for Airport Obstruction Surveys, 30 p. (2010) |
| 11 | 11-02/Task 14 | Helping Airports Understand Payment Card Industry Data Security Standard (PCI DSS), 30 p. (2010) |

Table 4 (continued)**Research Results Digests**

| No. | Proj. No. | Title, Pages, Publication Year |
|-----|-----------|--|
| 12 | 11-03 | Synthesis of Information Related to Airport Practices, 6 p. (2011) |

Legal Research Digests (Project 11-01)

| No. | Topic No. | Title, Pages, Publication Year |
|-----|-----------|---|
| 1 | 01-03 | Compilation of Airport Law Resources, 38 p. (2008) |
| 2 | 01-02 | Theory and Law of Airport Revenue Diversion, 30 p. (2008) |
| 3 | 01-04 | Survey of Laws and Regulations of Airport Commercial Ground Transportation, 186 p. (2008) |
| 4 | 01-01 | Compilation of DOT and FAA Airport Legal Determinations and Opinion Letters Through December 31, 2007 (& CD 68), 3000 p. (2008) |
| 5 | 01-05 | Responsibility for Implementation and Enforcement of Airport Land-Use Zoning Restrictions, 68 p. (2009) |
| 6 | 01-07 | The Impact of Airline Bankruptcies on Airports, 62 p. (2009) |
| 7 | 01-08 | Airport Governance and Ownership, 72 p. (2009) |
| 8 | 01-06 | The Right to Self-Fuel, 82 p. (2009) |
| 9 | 02-03 | Case Studies on Community Challenges to Airport Development, 64 p. (2010) |
| 10 | 02-04 | Analysis of Federal Laws, Regulations, and Case Law Regarding Airport Proprietary Rights, 52 p. (2010) |
| 11 | 03-03 | Survey of Minimum Standards: Commercial Aeronautical Activities at Airports, 60 p. (2011) |
| 12 | 03-01 | Fair Disclosure and Airport Impact Statements in Real Estate Transfers, 70 p. (2011) |

Syntheses (Project 11-03)

| No. | Topic No. | Title, Pages, Publication Year |
|-----|-----------|--|
| 1 | S01-01 | Innovative Finance and Alternative Sources of Revenue for Airports, 52 p. (2007) |
| 2 | S03-01 | Airport Aviation Activity Forecasting, 32 p. (2007) |
| 3 | S04-01 | General Aviation Safety and Security Practices, 44 p. (2007) |
| 4 | S10-01 | Counting Aircraft Operations at Non-Towered Airports, 33 p. (2007) |
| 5 | S03-02 | Airport Ground Access Mode Choice Models, 151 p. (2008) |
| 6 | S10-03 | Impact of Airport Pavement Deicing Products on Aircraft and Airfield Infrastructure, 68 p. (2008) |
| 7 | S03-03 | Airport Economic Impact Methods and Models, 76 p. (2008) |
| 8 | S10-02 | Common Use Facilities and Equipment at Airports, 132 p. (2008) |
| 9 | S02-01 | Effects of Aircraft Noise: Research Update on Selected Topics, 100 p. (2008) |
| 10 | S02-02 | Airport Sustainability Practices, 120 p. (2008) |
| 11 | S09-01 | Impact of Airport Rubber Removal Techniques on Runways, 116 p. (2008) |
| 12 | S04-02 | Preventing Aircraft--Vehicle Incidents during Weather Operations and Periods of Low Visibility, 80 p. (2008) |
| 13 | S03-05 | Effective Practices for Preparing Airport Improvement Program Benefit-Cost Analysis, 76 p. (2009) |
| 14 | S03-04 | Airport System Planning Practices, 80 p. (2009) |
| 15 | S04-03 | Identification of the Requirements and Training to Obtain Driving Privileges on Airfields, 52 p. (2009) |
| 16 | S02-03 | Compilation of Noise Programs in Areas Outside DNL 65, 112 p. (2009) |
| 17 | S02-04 | Approaches to Integrating Airport Development and Federal Environmental Review Process, 44 p. (2009) |
| 18 | S06-01 | Aviation Workforce Development Practices, 44 p. (2010) |
| 19 | S01-02 | Airport Revenue Diversification, 64 p. (2010) |
| 20 | S08-01 | Airport Terminal Facility Activation Techniques, 136 p. (2010) |
| 21 | S10-04 | Airport Energy Efficiency and Cost Reduction, 82 p. (2010) |
| 22 | S09-02 | Common Airport Pavement Maintenance Practices, 112 p. (2011) |
| 23 | S04-05 | Bird Harassment, Repellent, and Deterrent Techniques for Use on and Near Airports, 40 p. (2011) |

Table 4 (continued)

| Syntheses (Project 11-03) | | |
|----------------------------------|-------------------|--|
| No. | Topic No. | Title, Pages, Publication Year |
| 24 | S02-05 | Strategies and Financing Opportunities for Airport Environmental Programs, 228 p. (2011) |
| 25 | S03-06 | Strategies for Reuse of Underutilized or Vacant Airport Facilities, 72 p. (2011) |
| 26 | S04-06 | Current Airport Inspection Practices Regarding FOD (Foreign Object Debris/Damage), 96 p. (2011) |
| 27 | S06-02 | Airport Self-Inspection Practices, 122 p. (2011) |
| 28 | S10-06 | Investigating Safety Impacts of Energy Technologies on Airports and Aviation, 48 p. (2011) |
| 29 | S10-05 | Ramp Safety Practices, 68 p. (2011) |
| 30 | S01-03 | Airport Insurance Coverage and Risk Management Practices, 51 p. (2011) |
| 31 | S01-04 | Airline and Airline-Airport Consortium to Manage Terminals and Equipment, 102 p. (2011) |
| Web-Only Documents | | |
| No. | Proj. No. | Title, Pages, Publication Year |
| 1 | 01-03 | Analysis and Recommendations for Developing Integrated Airport Information Systems, 80 p. (2009) |
| 2 | 02-06 | Appendices to ACRP Report 11: Guidebook on Preparing Airport GHG Emissions Inventories (& Rep. 11), 87 p. (2009) |
| 3 | 02-01 | Formulations for Aircraft and Airfield Deicing and Anti-Icing: Aquatic Toxicity and Biochemical Oxygen Demand, 121 p. (2009) |
| 4 | 04-03 | Guidance for Identifying and Mitigating Approach Lighting System Hazards, 88 p. (2009) |
| 5 | 01-01 | Development of a Guidebook for Managing Small Airports (& Rep. 16), 124 p. (2009) |
| 6 | 01-05 | Evaluation and Selection of Airport Capital Project Delivery Methods, 213 p. (2009) |
| 7 | 11-02/Task 11 | How Proposed ARFF Standards Would Impact Airports, 115 p. (2009) |
| 8 | 02-01 | Alternative Aircraft Anti-Icing Formulations With Reduced Aquatic Toxicity and Biological Oxygen Demand, 141 p. (2010) |
| 9 | 11-02/Task 08 | Enhanced Modeling of Aircraft Taxiway Noise Scoping, 153 p. (2009) |
| 10 | 10-07 | Appendix to ACRP Report 41 (self-tagging) (& CD 83; & Rep. 41), 85 p. (2011) |
| 11 | 02-09 | A Comprehensive Development Plan for a Multimodal Noise and Emissions Model, 296 p. (2010) |
| 12 | 11-02/Task 17 | Risk Assessment of Proposed ARFF Standards, 105 p. (2011) |
| CDs | | |
| No. | Proj. No. | Title, Publication Year |
| 68 | 11-01/Topic 04-05 | Compilation of DOT and FAA Airport Legal Determinations and Opinion Letters Through December 31, 2007 (& LRD 4) (2008) |
| 70 | 02-05 | ACRP Report 15 Toolkit (& Rep. 15) (2009) |
| 73 | 03-09 | Workbook for ACRP Report 20: Strategic Planning in the Airport Industry (& Rep. 20) (2009) |
| 74 | 10-05 | Supplemental Materials for ACRP Report 30 (& Rep. 30) (2010) |
| 75 | 07-04 | Airport Passenger Terminal Planning Spreadsheet Models for ACRP Report 25, Volume 2 (& Rep. 25 Vol. 2) (2010) |
| 79 | 01-06 | Workbook for ACRP Report 19: Developing an Airport Performance-Measurement System (& Rep. 19) (2010) |
| 80 | 10-06 | Parking Forecast Model and Instructions for Use: Supplemental Materials for ACRP Report 34 (& Rep. 34) (2010) |
| 81 | 01-02 | Appendixes to ACRP Report 33 (& Rep. 33) (2011) |
| 82 | 03-06 | Database of APM Systems for ACRP Report 37 (& Rep. 37) (2010) |
| 83 | 10-07 | Decision-Making Tool for Evaluating Passenger Self-Tagging (& Rep. 41; & WOD 10) (2011) |
| 88 | 08-01 | Collection of Practices for ACRP Report 42 (& Rep. 42) (2011) |
| 89 | 02-13 | Practices That Enhance Environmental Stewardship (& Rep. 43) (2011) |

Table 4 (continued)

| CDs | | |
|------------|-----------|---|
| No. | Proj. No. | Title, Publication Year |
| 91 | 02-07 | The Alternative Fuels Investigation Tool (AFIT) for ACRP Report 46 (& Rep. 46) (2011) |
| 93 | 03-15 | Airport Forecasting Risk Assessment Program for ACRP Report 48 (& Rep. 48) (2011) |
| 94 | 01-09 | Interactive Resource Guide for ACRP Report 19A (& Rep. 19A) (2011) |
| 95 | 02-10 | AirportGEAR and Supplemental Material (& Rep. 56) (2011) |
| 98 | 04-08 | Runway Safety Area Risk Analysis Tool for ACRP Report 50 (& Rep. 50) (2011) |
| 102 | 03-11 | Supplemental Materials for ACRP Report 44 (& Rep. 44) (2011) |

| Conference Proceedings | | |
|-------------------------------|------------------|--|
| No. | Proj. No. | Title, Pages, Publication Year |
| 41 | 11-02 | Interagency-Aviation Industry Collaboration on Planning for Pandemic Outbreaks, 52 p. (2008) |
| 47 | 11-02/Task 13 | Research on the Transmission of Disease in Airports and on Aircraft, 70 p. (2010) |

Note

Publications in parentheses with an ampersand (&) are companion publications.

TABLE 5 SUMMARY OF PROJECT STATUS THROUGH DECEMBER 31, 2011

| No. | Title | Allocation | Contract Amount | Contractor | Start Date | End Date | Status | FAA Liaison(s) | Staff Officer |
|--------------------------|--|---|-----------------|---------------------------------|------------|------------|--|----------------|---------------|
| 1: Administration | | | | | | | | | |
| 01-01 | Guidebook for Managing Small Airports | \$400,000(06) | \$397,230 | University of Minnesota | 1/24/2007 | 3/31/2009 | Completed - Published as Report 16 and Web-Only Document 5 | | |
| 01-02 | Guidebook for Developing and Managing Airport Contracts | \$400,000(07) | \$315,000 | HNTB | 4/24/2007 | 2/28/2010 | Completed - Published as Report 33 | | |
| 01-03 | Integrating Airport Information Systems | \$300,000(07) | \$300,000 | Aero Tech Consulting | 8/10/2007 | 11/22/2008 | Completed - Published as Report 13 and Web-Only Document 1 | | |
| 01-04 | Marketing Guidebook for Small Airports | \$200,000(07) | \$200,000 | Eclat Consulting | 10/26/2007 | 9/30/2009 | Completed - Published as Report 28 | | |
| 01-05 | Guidebook for Airport Capital Project Delivery Systems | \$100,000(07) \$25,000 (08) \$70,000 (10) | \$194,994 | Northeastern University | 4/4/2007 | 7/30/2009 | Completed - Published as Report 21 | | |
| 01-06 | A Guidebook for Developing an Airport Performance Measurement System | \$400,000(08) | \$400,000 | Infrastructure Management Group | 5/6/2008 | 4/2/2010 | Completed - Published as Report 19 | | |
| 01-07 | Airport/Airline Agreements - Practices and Characteristics | \$400,000(08) | \$393,005 | Ricondo & Associates | 5/30/2008 | 4/5/2010 | Completed - Published as Report 36 | | |
| 01-08 | Guidebook for Developing and Leasing Airport Property | \$400,000(08) | \$350,000 | R.W. Armstrong and Associates | 6/24/2008 | 9/30/2010 | Completed - Published as Report 47 | | |
| 01-09 | Resource Guide to Airport Performance Indicators | \$400,000(09) | \$400,000 | Oliver Wyman, Inc. | 5/8/2009 | 12/31/2010 | Completed - Published as Report 19A | | |
| 01-10 | A Handbook for Developing, Implementing and Overseeing Airport Capital Plans | \$400,000(09) | \$399,955 | HNTB Corp. | 7/10/2009 | 12/31/2010 | Completed - Published as Report 49 | | |
| 01-11 | Understanding Airport In-Terminal Concession Programs | \$350,000(09) | \$350,000 | Leigh Fisher | 6/17/2009 | 5/31/2011 | Completed - Published as Report 54 | | |

TABLE 5 (continued)

| No. | Title | Allocation | Contract Amount | Contractor | Start Date | End Date | Status | FAA Liaison(s) | Staff Officer |
|-------|---|---------------------------------|-----------------|--------------------------------------|------------|------------|------------------------------------|------------------------|----------------|
| 01-12 | A Primer for Information Technology Systems at Airports | \$350,000(09) | \$348,843 | Faith Group, LLC | 7/7/2009 | 5/31/2011 | Completed - Published as Report 59 | | |
| 01-13 | Developing a Database-Driven Web Application for Benchmarking Airport Performance | \$500,000(09A) \$100,000(10) | \$549,727 | Amadeus Consulting | 9/30/2010 | 6/8/2012 | Research in progress | E. Novak | M. Salamone |
| 01-14 | Considering and Evaluating Airport Privatization | \$500,000(09A) | \$500,000 | LeighFisher | 5/10/2010 | 12/31/2011 | Completed - Publication Pending | K. Willis | T. Schatz |
| 01-15 | Assessing and Implementing Innovative Revenue Strategies - A Guide for Airports | \$400,000(10) | \$400,000 | Kramer Aerotech, Inc. | 5/14/2010 | 8/31/2012 | Research in progress | G. Fahnestock | L. Goldstein |
| 01-16 | Asset and Infrastructure Management for Airports | \$400,000(10) | \$400,000 | GHD Consulting | 6/16/2010 | 12/1/2011 | Complete - Publication Pending | K. Willis | M. Greenberger |
| 01-17 | Guidebook for Developing General Aviation Airport Business Plans | \$400,000(10) | \$398,350 | Aviation Management Consulting Group | 6/28/2010 | 12/28/2011 | Completed - Publication Pending | C. Hugunin | M. Greenberger |
| 01-18 | Application of Enterprise Risk Management at Airports | \$350,000(10) | \$350,000 | Marsh, USA | 6/30/2010 | 3/30/2012 | Research in progress | W. Schuller | M. Greenberger |
| 01-19 | Airport Capital Improvements: Developing a Cost-Estimating Model and Database | \$400,000(11) | \$400,000 | MCR Federal | 7/13/2011 | 3/13/2013 | Research in Progress | J. Breeden R. Samis | L. Goldstein |
| 01-20 | Procuring and Managing Professional Services for Airports | \$350,000(11) | \$350,000 | HNTB | 6/15/2011 | 12/14/2012 | Research in progress | N. Goodly | T. Schatz |
| 01-21 | A Guidebook for Airport-Airline Consortiums | \$400,000(12) | | | | | In Development | | T. Schatz |
| 01-22 | Risk Assessment for Capital and Maintenance Projects at Airports | \$300,000(12) | | | | | In Development | | M. Greenberger |

TABLE 5 (continued)

| No. | Title | Allocation | Contract Amount | Contractor | Start Date | End Date | Status | FAA Liaison(s) | Staff Officer |
|-----------------------|---|---------------|-----------------|--------------------------------------|------------|------------|---|----------------|---------------|
| 2: Environment | | | | | | | | | |
| 02-01 | Alternative Aircraft and Pavement Deicers and Anti-Icing Formulations with Improved Environmental Characteristics | \$600,000(06) | \$600,000 | University of South Carolina | 11/1/2006 | 2/28/2010 | Completed - Interim report published as Web-Only Document 3; summary of final report published as Research Results Digest 9; full final report published as Web-Only Document 8 | | |
| 02-02 | Deicing Planning Guidelines and Practices for Stormwater Management Systems | \$300,000(06) | \$300,000 | CH2M Hill | 10/9/2006 | 9/12/2008 | Completed - Published as Report 14 and Deicing Practices 1-41 | | |
| 02-03 | Aircraft and Airport-Related Hazardous Air Pollutants: Research Needs and Analysis | \$100,000(06) | \$100,000 | Aerodyne Research, Inc. | 12/19/2006 | 12/18/2007 | Completed - Published as Report 7 | | |
| 02-03A | Measurement of Gaseous HAP Emissions from Idling Aircraft as a Function of Engine and Ambient Conditions | \$500,000(06) | \$499,741 | Aerodyne Research, Inc. | 1/12/2009 | 12/30/2011 | Completed - Publication Pending | M. Gupta | L. Goldstein |
| 02-04 | Research Needs Associated with Particulate Emissions at Airports | \$100,000(06) | \$99,897 | Environmental Consulting Group, Inc. | 1/2/2007 | 3/1/2008 | Completed - Published as Report 6 | | |
| 02-04A | Summarizing and Interpreting Aircraft Gaseous and Particulate Emissions Data | \$350,000(07) | \$349,470 | University of Missouri-Rolla | 4/12/2007 | 7/11/2008 | Completed - Published as Report 9 | | |
| 02-05 | Aircraft Noise: A Toolkit for Managing Community Expectations | \$500,000(07) | \$399,982 | Landrum & Brown | 4/20/2007 | 3/31/2009 | Completed - Published as Report 15 | | |
| 02-06 | Guidebook on Preparing Airport Greenhouse Gas (GHG) Emissions Inventories | \$200,000(07) | \$199,403 | Wyle Laboratories | 10/9/2007 | 9/8/2008 | Completed - Published as Report 11 and Web-Only Document 2 | | |
| 02-07 | Handbook for Analyzing the Costs and Benefits of Alternative Turbine Engine Fuels at Airports | \$500,000(07) | \$499,960 | CSSI, Inc. | 10/22/2007 | 10/29/2010 | Completed - Published as Report 46 | | |

TABLE 5 (continued)

| No. | Title | Allocation | Contract Amount | Contractor | Start Date | End Date | Status | FAA Liaison(s) | Staff Officer |
|-------|---|--------------------------------|-----------------|---|------------|------------|---|---------------------------|---------------|
| 02-08 | Quantifying Contributions to Local Air Quality Impacts from Airport-Related Emissions | \$600,000(08) | \$599,970 | Wyle Laboratories, Inc. | 6/4/2008 | 12/30/2011 | Completed - Publication Pending | M. Gupta | L. Goldstein |
| 02-09 | A Comprehensive Development Plan for a Multimodal Noise and Emissions Model | \$200,000(08) | \$199,630 | Wyle Laboratories, Inc. | 7/7/2008 | 10/29/2010 | Completed - Published as Web-Only Document 11 | | |
| 02-10 | Practical Greenhouse Gas Emission Reduction Strategies for Airports | \$500,000(09) | \$499,921 | CDM Federal Programs Corp | 6/9/2009 | 6/9/2011 | Completed - Published as Report 56 | | |
| 02-11 | A Handbook for Addressing Water Resource Issues Affecting Airport Capacity Enhancement Planning | \$150,000(09) | \$150,000 | Gresham, Smith and Partners | 5/11/2009 | 5/31/2011 | Completed - Published as Report 53 | | |
| 02-12 | Environmental Optimization of Aircraft Departures: Fuel Burn, Emissions, and Noise | \$300,000(09) | \$300,000 | Wyle Laboratories, Inc. | 4/20/2009 | 12/11/2011 | Completed - Publication Pending | R. Cointin | L. Goldstein |
| 02-13 | Guidebook of Practices for Improving Environmental Performance at Small Airports | \$200,000(09) \$ 75,000(08) | \$200,000 | Gresham, Smith and Partners | 6/16/2009 | 8/20/2010 | Completed - Published as Report 43 | | |
| 02-14 | Guidebook for Selecting Methods to Monitor Airport and Aircraft Deicing Materials | \$200,000(09A) | \$150,000 | Gresham, Smith and Partners | 6/3/2010 | 11/30/2011 | Completed - Publication Pending | E. Melisky L. Wedande | J. Navarrete |
| 02-15 | Recycling Strategies for the Airport Industry | \$300,000(09A) | \$300,000 | Cascadia Consulting Group | 9/22/2010 | 9/22/2012 | Research in progress | J. Barrow S. Urlass | M. Salamone |
| 02-16 | Airport Ground Support Equipment (GSE) Inventory and Emission Reduction Strategies | \$600,000(09A) | \$599,717 | CDM Federal Programs Corp. | 6/18/2010 | 12/17/2011 | Completed - Publication Pending | R. Iovinelli J. Plante | T. Schatz |
| 02-17 | Measuring PM Emissions from Auxiliary Power Units, Tires and Brakes | \$500,000(09A) | \$500,000 | Missouri University of Science and Technology | 9/3/2010 | 9/2/2012 | Research in progress | C. Ma | J. Navarrete |
| 02-18 | Guidelines for Integrating Alternative Jet Fuel Into the Airport Setting | \$250,000(09A) | \$249,982 | Metron Aviation | 6/17/2010 | 10/16/2011 | Completed - Publication Pending | N. Brown C. Hugunin | T. Schatz |

TABLE 5 (continued)

| No. | Title | Allocation | Contract Amount | Contractor | Start Date | End Date | Status | FAA Liaison(s) | Staff Officer |
|--------|--|----------------|-----------------|------------------------------------|------------|------------|---------------------------------|------------------------------------|----------------|
| 02-19 | Winter Design Storm Factors for Airports | \$300,000(09A) | \$249,999 | CH2M Hill | 6/24/2010 | 12/1/2012 | Research in progress | E. Melisky | M. Greenberger |
| 02-20 | The Role of Air Travel in the Transmission and Spread of Insect-Borne Diseases | \$250,000(10) | \$249,995 | University of Florida | 9/7/2010 | 3/6/2012 | Research in progress | S. Jones C. Ruehle | J. Navarrete |
| 02-20A | Evaluating and Mitigating the Risk of Disease Transmission at Airports and on Aircraft | \$200,000(11) | \$200,000 | Environmental Health & Engineering | 7/6/2011 | 1/6/2013 | Research in Progress | S. Jones | J. Navarrete |
| 02-21 | Evaluation of Airport Emissions Within State Implementation Plans | \$500,000(10) | \$499,805 | KB Environmental Sciences | 8/31/2010 | 2/29/2012 | Research in progress | J. Byers R. Iovinelli | L. Goldstein |
| 02-22 | Incorporating Sustainability into Traditional Airport Projects | \$300,000(09A) | \$300,000 | Landrum & Brown | 7/12/2010 | 3/31/2012 | Research in progress | M. Hoven S. Urlass | M. Greenberger |
| 02-23 | Alternative Fuels as a Means to Reduce PM2.5 Emissions at Airports | \$500,000(10) | \$499,798 | Project Performance Corp/AEA Group | 7/6/2010 | 12/31/2012 | Research in progress | W. Gillette | J. Navarrete |
| 02-24 | Guidelines for Airport Sound Insulation Programs | \$200,000(10) | \$200,000 | Jones Payne Group | 8/27/2010 | 4/26/2012 | Research in progress | R. Etter B. He | T. Schatz |
| 02-25 | Evaluating Alternatives for Aircraft Ground Power, Heating and Air Conditioning | \$200,000(10) | \$199,773 | ESA Airports, Inc. | 7/7/2010 | 12/31/2011 | Completed - Publication Pending | L. Butler-Guttilla R. Jefferies | M. Greenberger |
| 02-26 | Assessing Aircraft Noise Conditions Affecting Student Learning | \$450,000(10) | \$449,672 | Wyle Laboratories, Inc. | 6/26/2010 | 2/25/2012 | Research in progress | V. Cattlett J. DiPardo | L. Goldstein |
| 02-27 | Aircraft Taxi Noise Database for Airport Noise Modeling | \$150,000(10) | \$149,779 | Wyle Laboratories, Inc. | 6/11/2010 | 12/30/2011 | Completed - Publication Pending | J. Byers B. He | L. Goldstein |
| 02-27A | Developing a Generic Commercial Jet Taxi Noise Directivity Pattern for AEDT | \$75,000(12) | | | | | In Development | | L. Goldstein |
| 02-28 | Airport Sustainability Practices: Tools for Evaluating, Measuring, and Implementing | \$800,000(11) | \$599,874 | Vanasse Hangen Brustlin, Inc. | 6/27/2011 | 12/26/2012 | Research in progress | S. Urlass R. Thompson | J. Navarrete |

TABLE 5 (continued)

| No. | Title | Allocation | Contract Amount | Contractor | Start Date | End Date | Status | FAA Liaison(s) | Staff Officer |
|-------|--|---------------|-----------------|-------------------------------|------------|------------|----------------------|---------------------------|-------------------|
| 02-29 | Guidance for Treatment of Deicing-Impacted Airport Stormwater | \$600,000(11) | \$500,000 | Gresham Smith and Partners | 5/31/2011 | 2/5/2013 | Research in progress | C. Pociask | J. Navarrete |
| 02-30 | Enhancing the Airport-Industry Database of Sustainable Practices | \$500,000(11) | \$500,000 | CDM Federal Prgrams Corp. | 7/18/2011 | 1/18/2014 | Research in Progress | P. Magnotta | J. Navarrete |
| 02-31 | Assessment of Sound Insulation Treatments | \$350,000(11) | \$349,980 | Wyle Laboratories, Inc. | 7/8/2011 | 10/8/2012 | Research in Progress | J. Byers B. He | M. Greenberger |
| 02-32 | Understanding Nuisance Microbial Biofilms in Receiving Waters Impacted by Airport Deicing Activities | \$400,000(11) | \$300,000 | CH2M Hill | 7/20/2011 | 3/19/2013 | Research in Progress | A. Fenedick C. Pociask | J. Navarrete |
| 02-33 | Guidance for Estimating Airport Construction Emissions | \$350,000(11) | \$349,980 | Wyle Laboratories, Inc. | 7/1/2011 | 12/31/2012 | Research in Progress | A. Fisher D. Perkins | T. Schatz |
| 02-34 | Quantifying Aircraft Lead Emissions at Airports | \$500,000(11) | \$500,000 | Sierra Research, Inc. | 6/3/2011 | 12/3/2012 | Research in progress | J. Byers W. Gillette | M. Greenberger |
| 02-35 | Research Methods for Understanding Aircraft Noise Annoyance and Sleep Disturbance | \$600,000(11) | \$599,993 | Harris Miller Miller & Hansen | 9/20/2011 | 9/19/2013 | Research in progress | A. Hanson N. Sizov | J. Navarrete |
| 02-36 | Assessing Opportunities for Alternative Fuel Distribution Programs | \$500,000(11) | \$400,000 | Metron Aviation, Inc. | 5/26/2011 | 12/6/2012 | Research in progress | N. Brown C. Hugunin | T. Schatz |
| 02-37 | Integrated Noise Model Accuracy for General Aviation Aircraft | \$400,000(11) | \$350,000 | Harris Miller Miller & Hanson | 6/13/2011 | 2/13/2013 | Research in progress | B. He G. Helm | J. Navarrete |
| 02-38 | Guidance for Energy Facilities Compatability with Airports and Airspace | \$450,000(12) | | | | | In Development | | T. Schatz |
| 02-39 | Applying Whole Effluent Toxicity Testing to Evaluate Airport Runoff | \$500,000(12) | | | | | In Development | | J. Navarrete |
| 02-40 | Climate Change Adaption Planning: Risk Assessment for Airports | \$500,000(12) | | | | | In Development | | M. Salamone |

TABLE 5 (continued)

| No. | Title | Allocation | Contract Amount | Contractor | Start Date | End Date | Status | FAA Liaison(s) | Staff Officer |
|-------------------------------|--|---------------|-----------------|----------------------------|------------|------------|---|----------------------|---------------|
| 02-41 | Improving Take-Off Thrust Setting Estimates for Airport Emissions Inventories | \$450,000(12) | | | | | In Development | | J. Navarrete |
| 02-42 | Understanding Air Quality and Public Health Studies Related to Airports | \$200,000(12) | | | | | In Development | | J. Navarrete |
| 3: Policy and Planning | | | | | | | | | |
| 03-01 | Light Detection and Ranging (LIDAR) Deployment for Airport Obstructions Surveys | \$350,000(06) | \$350,000 | University of Mississippi | 1/30/2007 | 12/31/2009 | Completed - Published as Research Results Digest 10 | | |
| 03-02 | Airport Passenger-Related Processing Rates Guidebook | \$200,000(06) | \$200,000 | HNTB | 1/16/2007 | 6/30/2009 | Completed - Published as Report 23 | | |
| 03-03 | Enhancing Airport Land Use Compatibility | \$500,000(06) | \$500,000 | Mead & Hunt, Inc. | 12/28/2006 | 9/15/2009 | Completed - Published as Report 27, Volumes 1 and 2 | | |
| 03-04 | Guidebook for Airport-User Survey Methodology | \$250,000(06) | \$249,350 | Jacobs Consultancy | 1/16/2007 | 8/31/2009 | Completed - Published as Report 26 | | |
| 03-05 | Passenger Space Allocation Guidelines for Planning and Design of Airport Terminals | \$400,000(07) | \$399,928 | TransSolutions | 6/28/2007 | 5/31/2011 | Completed - Published as Report 55 | | |
| 03-06 | Guidebook for Planning and Implementing Automated People Mover Systems at Airports | \$500,000(07) | \$395,341 | Lea & Elliott | 6/12/2007 | 3/30/2010 | Completed - Published as Report 37 | | |
| 03-07 | A Guidebook for Measuring Performance of People Mover Systems at Airports | \$300,000(07) | \$300,000 | Lea & Elliott | 6/13/2007 | 1/31/2012 | Research in progress | G. Neumann A. Jan | L. Goldstein |
| 03-08 | Passenger Air-Service Development Techniques | \$300,000(07) | \$300,000 | InterVISTAS-ga2 Consulting | 6/21/2007 | 5/15/2009 | Completed - Published as Report 18 | | |
| 03-09 | Guidebook for Strategic Planning in the Airport Industry | \$425,000(07) | \$321,049 | Ricondo & Associates | 6/27/2007 | 6/15/2009 | Completed - Published as Report 20 | | |

TABLE 5 (continued)

| No. | Title | Allocation | Contract Amount | Contractor | Start Date | End Date | Status | FAA Liaison(s) | Staff Officer |
|-------|--|---------------|-----------------|-------------------------------------|------------|------------|------------------------------------|----------------------|---------------|
| 03-10 | Innovative Approaches to Addressing Aviation Capacity Issues in Coastal Mega-Regions | \$300,000(07) | \$300,000 | Resource Systems Group, Inc. | 2/6/2008 | 9/30/2009 | Completed - Published as Report 31 | | |
| 03-11 | A Guidebook for the Preservation of Public-Use Airports | \$600,000(08) | \$522,430 | L. Robert Kimball & Associates | 6/23/2008 | 1/15/2011 | Completed - Published as Report 44 | | |
| 03-12 | Guidebook for Preparing Peak Period and Operational Profiles to Improve Airport Facility Planning and Environmental Analyses | \$350,000(08) | \$347,044 | HNTB Corporation | 8/13/2008 | 1/31/2012 | Research in progress | T. Diana | L. Goldstein |
| 03-13 | Understanding Airspace, Objects, and Their Effects on Airports | \$200,000(08) | \$199,938 | Jacobs Consultancy | 7/11/2008 | 4/30/2010 | Completed - Published as Report 38 | | |
| 03-14 | Airport Passenger Conveyance System Usage/Throughput | \$300,000(08) | \$300,000 | Trans Solutions, LLC | 8/26/2008 | 12/30/2011 | Completed - Publication Pending | G. Neumann | L. Goldstein |
| 03-15 | Impact of Jet Fuel Price Uncertainty on Airport Planning and Development | \$400,000(09) | \$399,970 | GRA, Inc. | 3/4/2009 | 2/28/2011 | Completed - Published as Report 48 | | |
| 03-16 | Guidebook for Estimating the Economic Impact of Air Cargo at Airports | \$500,000(09) | \$499,860 | Battelle Memorial Institute | 6/5/2009 | 1/31/2012 | Research in progress | J. Herbert R. Samis | L. Goldstein |
| 03-17 | Evaluating Airfield Capacity | \$525,000(09) | \$525,000 | LeighFisher | 6/29/2009 | 1/31/2012 | Research in progress | A. McCormick | T. Schatz |
| 03-18 | Operational and Business Continuity Planning for Prolonged Airport Disruptions | \$350,000(10) | \$348,292 | Risk Solutions International, LLC | 6/3/2010 | 2/28/2012 | Research in progress | L. Valero | T. Schatz |
| 03-19 | Passenger Value of Time, Benefit-Cost Analysis, and Capital Investment Decisions | \$350,000(10) | \$349,944 | Economic Development Research Group | 7/26/2010 | 9/1/2012 | Research in progress | R. Samis D. Walsh | L. Goldstein |
| 03-20 | Defining and Measuring Aircraft Delay and Airport Capacity Thresholds | \$250,000(10) | \$250,000 | Trans Solutions, LLC | 8/30/2010 | 6/30/2012 | Research in progress | E. Hernandez | J. Navarrete |
| 03-21 | Developing and Maintaining Support for New Airport Capacity | \$300,000(10) | \$299,980 | Mead & Hunt | 6/3/2010 | 6/30/2012 | Research in progress | L. Loarte | J. Navarrete |

TABLE 5 (continued)

| No. | Title | Allocation | Contract Amount | Contractor | Start Date | End Date | Status | FAA Liaison(s) | Staff Officer |
|------------------|--|--------------------------------|-----------------|-----------------------------------|------------|------------|--|------------------------|-------------------|
| 03-22 | Addressing Uncertainty About Future Airport Activity Levels in Airport Decision Making | \$350,000(10) | \$350,000 | Inter VISTAS Consulting, LLC | 7/15/2010 | 1/14/2012 | Research in progress | D. Bhadra P. Devote | L. Goldstein |
| 03-23 | Integrating Aviation and Passenger Rail Planning | \$400,000(10) | \$399,452 | Resource Systems Group | 7/29/2010 | 1/28/2012 | Research in progress | K. Jacobs | T. Schatz |
| 03-24 | Guidelines for Air Cargo Facility Planning and Development | \$400,000(11) | \$400,000 | CDM/Wilbur Smith | 7/17/2011 | 5/13/2013 | Research in Progress | C. Hugunin | L. Goldstein |
| 03-25 | Regulatory Compliance Costs and the Impact on Small Airports | \$300,000(11) | \$299,987 | Unison Consulting, Inc. | 6/3/2011 | 6/12/2012 | Research in progress | K. Slusarski | T. Schatz |
| 03-26 | Understanding Airline and Passenger Choice in Regions with Multiple Airports | \$250,000(11) | \$250,000 | InterVISTAS | 8/4/2011 | 1/4/2013 | Research in Progress | K. Duffy P. LeBoff | J. Navarrete |
| 03-27 | Evaluating Methods for Counting Aircraft Operations at Non-Towered Airports | \$400,000(11) | \$400,000 | Woolpert | 11/21/2011 | 11/20/2013 | Research in Progress | T. Dupree B. Mello | J. Navarrete |
| 03-28 | Economic Impact of U.S. Airports | \$400,000(12) | | | | | In Development | | T. Schatz |
| 4: Safety | | | | | | | | | |
| 04-01 | Analysis of Aircraft Overruns and Undershoots for Runway Safety Areas | \$250,000(06) | \$249,986 | Applied Research Associates, Inc. | 9/19/2006 | 1/31/2008 | Completed - Published as Report 3 | | |
| 04-02 | Lightning-Warning Systems for Use by Airports | \$200,000(06) | \$199,937 | MDA Federal, Inc. | 11/7/2006 | 11/7/2008 | Completed - Published as Report 8 | | |
| 04-03 | Guidance for Identifying and Mitigating Approach Lighting System Hazards | \$300,000(07) | \$300,000 | Virginia Tech | 10/3/2007 | 2/2/2009 | Completed - Published as Research Results Digest 6 and Web-Only Document 4 | | |
| 04-04 | Simulation-Based Training and Exercise of Civil Aviation Emergency Response Personnel | \$500,000(07) \$300,000(12) | \$499,093 | Applied Research Associates | 9/12/2007 | 12/31/2011 | Completed - Publication Pending | M. Tonnacliff | M. Greenberger |

TABLE 5 (continued)

| No. | Title | Allocation | Contract Amount | Contractor | Start Date | End Date | Status | FAA Liaison(s) | Staff Officer |
|--------|---|----------------|-----------------|---------------------------------|------------|------------|---|------------------------|----------------|
| 04-05 | A Guidebook for Airport Safety Management Systems | \$300,000(07) | \$300,000 | Applied Research Associates | 5/24/2007 | 5/15/2009 | Completed - Published as Report 1, Volume 2 | | |
| 04-06 | A Guidebook for Addressing Aircraft/Wildlife Hazards at General Aviation Airports | \$300,000(08) | \$299,905 | Biozone | 6/2/2008 | 1/15/2010 | Completed - Published as Report 32 | | |
| 04-07 | Comparison of Airport Apron Management and Control Programs With and Without Regulatory Oversight | \$300,000(08) | \$300,000 | Ricondo & Associates | 5/8/2009 | 8/30/2011 | Completed - Publication Pending | E. Jarvis R. Moseng | M. Salamone |
| 04-07A | Best Practices for Managing the Use of Towbarless Tractors at Airports | \$300,000(08) | \$38,795 | Ricondo & Associates | 4/20/2009 | 8/30/2011 | Completed - Publication Pending | E. Jarvis R. Moseng | M. Salamone |
| 04-08 | Improved Models for Risk Assessment of Runway Safety Areas (RSA) | \$400,000(09) | \$400,000 | Applied Research Associates | 6/8/2009 | 3/31/2011 | Completed - Published as Report 50 | | |
| 04-09 | Risk Assessment Method to Support Modification of Airfield Separation Standards | \$250,000(09) | \$250,000 | Applied Research Associates | 6/10/2009 | 2/16/2011 | Completed - Published as Report 51 | | |
| 04-10 | Airport-to-Airport Mutual Aid Programs | \$300,000(09A) | \$300,000 | Innovative Emergency Management | 7/6/2010 | 3/1/2012 | Research in progress | R. Moseng | M. Greenberger |
| 04-11 | Integrating GIS in Emergency Management at Airports | \$350,000(11) | \$274,949 | Barich, Inc. | 7/12/2011 | 11/11/2013 | Research in Progress | G. Neumann | M. Greenberger |
| 04-12 | Using Integrated Emergency Data Communication Systems at Airports | \$400,000(11) | \$400,000 | Innovative Emergency Management | 7/15/2011 | 11/14/2012 | Research in Progress | M. Tonnacliff | T. Schatz |
| 04-13 | Integrating Community Emergency Response Teams at Airports | \$400,000(11) | \$400,000 | Innovative Emergency Management | 7/26/2011 | 7/26/2013 | Research in Progress | M. Tonnacliff | M. Greenberger |
| 04-14 | Runway Veer-Off Location Models Distribution Risk Assessment Model | \$200,000(12) | | | | | In Development | | J. Navarrete |

TABLE 5 (continued)

| No. | Title | Allocation | Contract Amount | Contractor | Start Date | End Date | Status | FAA Liaison(s) | Staff Officer |
|---------------------------|---|--------------------------------|-----------------|------------------------------------|------------|------------|--|----------------|---------------|
| 04-15 | Terminal Evacuation Planning | \$325,000(12) | | | | | In Development | | T. Schatz |
| 5: Security | | | | | | | | | |
| 05-01 | An Airport Guide for Regional Emergency Planning for CBRNE Events | \$250,000(06) | \$248,464 | System Planning Corp. | 11/15/2006 | 10/31/2008 | Completed - Published as Report 12 | | |
| 6: Human Resources | | | | | | | | | |
| 06-01 | Airport and Air Carrier Resource Manual: Employees Coping with Traumatic Events | \$300,000(07) | \$299,416 | University of North Dakota | 12/5/2007 | 5/31/2009 | Completed - Published as Report 22 | | |
| 06-02 | Airport Leadership Development Program | \$100,000(10) | \$100,000 | Ohio State University | 9/29/2010 | 2/29/2012 | Research in Progress | R. Joel | M. Salamone |
| 7: Design | | | | | | | | | |
| 07-01 | Innovations for Airport Terminal Facilities | \$400,000(06) | \$400,000 | Corgan Associates, Inc. | 12/8/2006 | 7/8/2008 | Completed -Published as Report 10 | | |
| 07-02 | Airport Curbside and Terminal Area Roadway Operations | \$400,000(06) \$150,000(09) | \$528,000 | Jacobs Consultancy | 11/15/2006 | 5/19/2010 | Completed - Published as Report 40 | | |
| 07-03 | Developing Improved Civil Aircraft Arresting Systems | \$500,000(07) | \$499,455 | Protection Engineering Consultants | 5/23/2007 | 10/31/2009 | Completed - Published as Report 29 | | |
| 07-04 | Airport Passenger Terminal Planning and Design: Spreadsheet Models and User's Guide | \$400,000(07) | \$400,000 | Landrum and Brown | 6/6/2007 | 10/31/2009 | Completed - Published as Report 25, Volume 2 | | |
| 07-05 | Airport Passenger Terminal Planning and Design: Guidebook | \$400,000(07) | \$400,000 | Landrum and Brown | 6/28/2007 | 10/31/2009 | Completed - Published as Report 25, Volume 1 | | |
| 07-06 | Airport Signage and Wayfinding Information Guidelines | \$250,000(08) | \$250,000 | Gresham, Smith and Partners | 8/21/2008 | 3/1/2011 | Completed - Published as Report 52 | | |

TABLE 5 (continued)

| No. | Title | Allocation | Contract Amount | Contractor | Start Date | End Date | Status | FAA Liaison(s) | Staff Officer |
|------------------------|--|---------------|-----------------|-----------------------------------|------------|-----------|------------------------------------|----------------|----------------|
| 07-07 | Evaluating Terminal Renewal Versus Replacement Options | \$400,000(10) | \$400,000 | Ricondo & Associates | 8/16/2010 | 3/15/2012 | Research in progress | E. Novak | T. Schatz |
| 07-08 | Improving Terminal Design to Increase Revenue Generation and Customer Satisfaction | \$500,000(11) | \$496,888 | Landrum & Brown, Inc. | 6/3/2011 | 12/8/2012 | Research in progress | E. Novak | T. Schatz |
| 07-09 | Aircraft Ramp Design and Configuration | \$250,000(12) | | | | | In Development | | T. Schatz |
| 07-10 | General Aviation Facility Planning | \$300,000(12) | | | | | In Development | | J. Navarrete |
| 07-11 | Evaluation Cost-Saving and Energy Reduction Technologies for Escalators and Moving Walkways at Airports | \$250,000(12) | | | | | In Development | | J. Navarrete |
| 8: Construction | | | | | | | | | |
| 08-01 | Sustainable Airport Construction Practices | \$150,000(09) | \$150,000 | Ricondo & Associates, Inc. | 6/1/2009 | 6/22/2010 | Completed - Published as Report 42 | | |
| 9: Maintenance | | | | | | | | | |
| 09-01 | Recommended Guidelines for the Collection and Use of Geospatially Referenced Data for Airfield Pavement Management | \$350,000(06) | \$299,636 | Applied Research Associates, Inc. | 11/6/2006 | 4/30/2010 | Completed - Published as Report 39 | | |
| 09-02 | Best Practices for Working in or Near Airport Movement Areas | \$500,000(11) | \$325,000 | Ricondo and Associates | 8/31/2011 | 2/3/2013 | Research in Progress | T. Mai | M. Greenberger |
| 09-03 | Airport Parking Garage Lighting Solutions | \$300,000(12) | | | | | In Development | | J. Navarrete |
| 09-04 | Recommissioning and Re-tuning Airport Facilities | \$250,000(12) | | | | | In Development | | J. Navarrete |

TABLE 5 (continued)

| No. | Title | Allocation | Contract Amount | Contractor | Start Date | End Date | Status | FAA Liaison(s) | Staff Officer |
|-----------------------|---|---|-----------------|----------------------|------------|-----------|---|----------------|----------------|
| 09-05 | Guidance in Successful Computer Maintenance Management Systems (CMMS) Selection and Practices | \$300,000(12) | | | | | In Development | | M. Greenberger |
| 09-06 | Sustainable Practices for Airport Maintenance and Operations | \$300,000(12) | | | | | In Development | | M. Greenberger |
| 09-07 | Airport Maintenance Roles in Planning, Design, Construction, Commissioning, and Activation | \$200,000(12) | | | | | In Development | | M. Salamone |
| 09-08 | Enhancing Compatibility of Storm Water and Wildlife Management Plans at Airports | \$250,000(12) | | | | | In Development | | J. Navarrete |
| 10: Operations | | | | | | | | | |
| 10-01 | Optimizing the Use of Aircraft Deicing and Anti-Icing Fluids | \$300,000(06) \$ 50,000(08) \$100,000(08) | \$349,030 | APS Aviation, Inc. | 3/20/2007 | 7/31/2010 | Completed - Published as Report 45 | | |
| 10-02 | Planning for Offsite Airport Terminals | \$350,000(06) | \$350,000 | MarketSense | 12/18/2006 | 9/1/2009 | Completed - Published as Report 35 | | |
| 10-03 | Guidebook for Evaluating Airport Parking Strategies and Supporting Technologies | \$300,000(07) | \$300,000 | Jacobs Consultancy | 9/14/2007 | 9/1/2009 | Completed - Published as Report 24 | | |
| 10-04 | Airports and the Newest Generation of General Aviation Aircraft | \$500,000(07) | \$496,390 | GRA, Inc. | 6/27/2007 | 5/31/2009 | Completed - Published as Report 17, Volumes 1 and 2 | | |
| 10-05 | Reference Guide on Understanding Common Use at Airports | \$500,000(08) | \$399,981 | Barich, Inc. | 5/30/2008 | 9/29/2009 | Completed - Published as Report 30 | | |
| 10-06 | Handbook to Assess the Impacts of Constrained Parking at Airports | \$400,000(08) | \$398,563 | Ricondo & Associates | 6/16/2008 | 3/8/2010 | Completed - Published as Report 34 | | |

TABLE 5 (continued)

| No. | Title | Allocation | Contract Amount | Contractor | Start Date | End Date | Status | FAA Liaison(s) | Staff Officer |
|-----------------------------|---|---|-----------------|-------------------------------|------------|------------|---|------------------|----------------|
| 10-07 | Current Status and Future Implications of Passenger Self-Tagging | \$350,000(09) | \$350,000 | Barich, Inc. | 6/16/2009 | 7/30/2010 | Completed - Published as Report 41 and Web Only Document 10 | | |
| 10-08 | Applying Intelligent Transportation Systems to Improve Airport Traveler Access Information | \$350,000(09) | \$350,000 | Gresham, Smith and Partners | 4/13/2009 | 1/31/2012 | Research in progress | R. Nicosia-Rusin | L. Goldstein |
| 10-09 | Elimination of Baggage Recheck for Arriving International Passengers | \$400,000(09) | \$400,000 | InterVISTAS-ga2 Consulting | 7/22/2009 | 10/31/2011 | Completed - Publication Pending | P. Lo | T. Schatz |
| 10-10 | Guidebook for Airport Irregular Operations (IROPS) Contingency Planning | \$600,000(10) | \$599,976 | Mead & Hunt | 8/26/2010 | 2/24/2012 | Research in progress | L. Chapman | T. Schatz |
| 10-11 | Creating a Collaborative Environment Between Airport Operations and Maintenance Departments | \$500,000(11) | \$4,399,840 | Amadeus Consulting | 7/27/2011 | 7/27/2013 | Research in Progress | M. Hovan | M. Greenberger |
| 10-12 | Managing Through the Fence Operations at Airports | \$350,000(12) | | | | | In Development | | M. Greenberger |
| 10-13 | Integrating NIMS for Personnel and resources at Airports | \$200,000(12) | | | | | In Development | | M. Greenberger |
| 10-14 | Designing Solutions for Disrupted Operations | \$300,000(12) | | | | | In Development | | T. Schatz |
| 10-15 | Guidebook for Airport Winter Operations | \$400,000(12) | | | | | In Development | | T. Schatz |
| 11: Special Projects | | | | | | | | | |
| 11-01 | Legal Aspects of Airport Programs | \$200,000(06) \$475,000(07) \$300,000(08) \$600,000(09) \$500,000(10) \$ 50,000(11) \$200,000(12) | | Transportation Research Board | 2/1/2006 | | Continuing Project: See 11-01 Table | | M. Greenberger |

TABLE 5 (continued)

| No. | Title | Allocation | Contract Amount | Contractor | Start Date | End Date | Status | FAA Liaison(s) | Staff Officer |
|-------|--|---|-----------------|-------------------------------|------------|----------|---|----------------|---------------|
| 11-02 | Quick Response for Special Needs | \$590,000(06) \$467,000(07) \$1,000,000(08) \$25,000(09) \$250,000(10) \$100,000(11) \$140,000(12) | | Various | 2/1/2006 | | Continuing Project: See 11-02 Table | P. Friedman | M. Salamone |
| 11-03 | Synthesis of Information Related to Airport Practices | \$500,000(06) \$700,000(07) \$500,000(08) \$500,000(09) \$900,000(10) \$700,000(11) \$1,270,000(12) | | Transportation Research Board | 2/1/2006 | | Continuing Project: See 11-03 Table | | M. Salamone |
| 11-04 | Graduate Research Award Program on Public - Sector Aviation Issues | \$100,000(08) \$100,000(09) \$100,000(10) \$140,000(11) \$140,000(12) | | | | | Continuing Project: Papers published as TRB TRR 2184 3rd Volume - Spring 2012 | J. Wharff | L. Goldstein |
| 11-05 | Dissemination of ACRP Research Results | \$600,000(10) \$200,000(12) | | | | | Continuing Project | J. Showalter | M. Salamone |
| 11-06 | Evaluating ACRP Processes | \$250,000(10) | | | | | Completed | | |

TABLE 5 (continued)**ACRP PROJECT 11-01****Legal Aspects of Airport Programs**

| No. | Title | Consultant | Start Date | Estimated Completion Date | Staff Officer |
|-------|---|-------------------------------|---------------|--|---------------|
| 01-01 | Compilation of DOT and FAA Airport Legal Determinations and Opinion Letters through December 31, 2007 | Spiegel & McDiarmid | December 2006 | Completed - Published as Legal Research Digest 4 (CD ROM 68) | |
| 01-02 | Theory and Law of Airport Revenue Diversion | Paul Dempsey | January 2007 | Completed - Published as Legal Research Digest 2 | |
| 01-03 | Compilation/List of Airport Law Resources | McGill University | January 2007 | Completed - Published as Legal Research Digest 1 | |
| 01-04 | Survey of Airport Laws and Regulation of Commercial Ground Transportation | Smith Armundsen | April 2007 | Completed - Published as Legal Research Digest 3 | |
| 01-05 | Responsibility for Implementation and Enforcement of Airport Land-Use Zoning Restrictions | William V. Cheek & Associates | April 2007 | Completed - Published as Legal Research Digest 5 | |
| 01-06 | The Right to Self-Fuel | C. Daniel Prather Ph.D. | January 2008 | Completed - Published as Legal Research Digest 8 | |
| 01-07 | The Impact of Airline Bankruptcies on Airports | Jocelyn Waite | October 2007 | Completed - Published as Legal Research Digest 6 | |
| 01-08 | Airport Governance and Ownership | Daniel S. Reimer | February 2008 | Completed - Published as Legal Research Digest 7 | |
| 01-09 | Survey of Elements of Disparity Studies for Airport Disadvantaged Business Enterprise Programs | | | Terminated | |
| 02-01 | Obstructions Affecting Navigatable Airspace | Cheek & Associates | July 2008 | Incorporated into 02-05 | |
| 02-02 | Use and Success of Avigation Easement and Other Tools for Airport - Compatible Land Use and Development of Model Language | Lemongrass Consulting | June 2008 | Incorporated into 02-05 | |
| 02-03 | Case Studies on Community Challenges to Airport Development | Jaye Pershing Johnson | October 2008 | Completed - Published as Legal Research Digest 9 | |
| 02-04 | Analysis of Federal Laws, Regulations, and Case Law Regarding Airport Proprietary Rights | Jodi Howich, Esq. | October 2008 | Completed - Published as Legal Research Digest 10 | |

TABLE 5 (continued)

| No. | Title | Consultant | Start Date | Estimated Completion Date | Staff Officer |
|-------|---|-------------------------|---------------|---|----------------|
| 02-05 | Obstructions Affecting Navigatable Airspace and the Use and Success of Avigation Easements | Jocelyn Waite | August 2010 | Completed - Publication Pending | M. Greenberger |
| 03-01 | Fair Disclosure of Airport Impacts in Real Estate Transfers | Larry Thomas, Esq. | July 2009 | Completed - Published as Legal Research Digest 12 | M. Greenberger |
| 03-02 | Compilation of State Aviation Authorizing Legislation | Jodi Howick, Esq. | August 2009 | Completed | M. Greenberger |
| 03-03 | Survey of Minimum Standards: Commercial Aeronautical Activities at Airports | Kaplan, Kirsh, Rockwell | July 2009 | Completed - Published as Legal Research Digest 11 | |
| 03-04 | Airport Rates and Charges: Law and Policy | Speigel & McDiarmid | November 2009 | Completed - Incorporated into 4-05 | |
| 03-05 | Analyses of State and Federal Regulations that May Impede State Initiatives to Reduce an Airport's Carbon Footprint | Kaplan, Kirsh, Rockwell | November 2009 | Completed - Publication Pending | M. Greenberger |
| 03-06 | An Index and Digest of Decisions in LRD 1 | Kaplan, Kirsh, Rockwell | December 2009 | Completed - Publication Pending | M. Greenberger |
| 04-01 | Airport Liability for Wildlife Management | Broad and Cassell | April 2011 | April 2012 | M. Greenberger |
| 04-02 | Legal Issues Related to Developing SMS and SMRD Documents Which May be Available to the Public | Foley & Lardner | December 2012 | Research in progress | M. Greenberger |
| 04-03 | Analysis of Federal Laws, Regulations, Case Law, and Survey of Existing Airport NPDES Permits Regarding Tenant-Operator Responsibilities Under NPDES and Storm Water Management BMP's Under Owner/Airport's Operating Permits | | | In development | M. Greenberger |
| 04-04 | Buy America Requirements for Federally Funded Airports | Conner Gwyn Schenk | April 2011 | June 2012 | M. Greenberger |
| 04-05 | Compilation of DOT and FAA Airport Legal Determinations and Opinion Letters, through December 2011 | | | In development | M. Greenberger |

TABLE 5 (continued)

| No. | Title | Consultant | Start Date | Estimated Completion Date | Staff Officer |
|-------|--|-------------------|------------|---------------------------|----------------|
| 04-06 | The Role of the Airport Sponsor in Airport Planning and Environmental Reviews of Proposed Development Projects Under the National Environmental Policy Act (NEPA) and State Mini-NEPA Laws | | | In development | M. Greenberger |
| 04-07 | Airport Contracting Survey of Federal and State Standards | Broad and Cassell | April 2011 | May 2012 | M. Greenberger |
| 05-01 | The First Amendment and Airport Activities | | | In development | M. Greenberger |
| 05-02 | Sovereign Immunity and Applicability to Airports | | | In development | M. Greenberger |
| 05-03 | The Fourth Amendment and Airports | | | In development | M. Greenberger |
| 05-04 | Airport Grant Assurances: General Requirements and Economic Nondiscrimination | | | In development | M. Greenberger |

TABLE 5 (continued)
ACRP PROJECT 11-02
Quick Response for Special Needs

| No. | Title | Contractor | Start Date | End Date | Status | Staff Officer |
|---------|--|-------------------------------------|------------|------------|--|---------------|
| Task 01 | Model for Improving Energy Use in U.S. Airport Facilities | Texas A&M Energy Systems Laboratory | 10/13/2006 | 7/31/2007 | Completed - Published as Research Results Digest 2 | |
| Task 02 | Ground Access to Major Airports by Public Transportation | Matthew Coogan | 8/16/2006 | 9/30/2007 | Completed - Published as Report 4 | |
| Task 03 | Evaluation and Mitigation of Aircraft Slide Evacuation Injuries | George Washington University | 10/9/2006 | 12/15/2007 | Completed - Published as Report 2 | |
| Task 04 | Airport Safety Management Systems for Airports: Overview | MITRE Corporation | 1/2/2007 | 11/2/2007 | Completed - Published as Report 1, Volume 1 | |
| Task 05 | Quarantine Facilities for Arriving Air Travelers: Identification of Planning Needs and Costs | System Planning Corp. | 3/28/2007 | 11/3/2007 | Completed - Published as Report 5 | |
| Task 06 | Interagency-Industry Collaboration on Pandemic Planning for Aviation: A Workshop | TRB Technical Activities Division | 2/15/2007 | 9/15/2007 | Completed - Workshop Held - Results Published as TRB Conference Proceedings 41 | |
| Task 07 | Current and Emerging Issues Facing the Airport Industry | TRB Staff | 8/1/2007 | 1/31/2009 | Completed - Published as Research Results Digest 5 | |
| Task 08 | Enhanced Modeling of Aircraft Taxiway Noise - Scoping | Wyle Laboratories | 2/14/2008 | 8/31/2009 | Completed - Published as Web-Only Document 9 | |
| Task 09 | Visibility of Airfield Signs and Markings from Aircraft and Ground Vehicles | | | | Cancelled | |
| Task 10 | Estimate of National Use of Aircraft and Airfield Deicing Materials | CH2M Hill | 10/16/2007 | 6/15/2008 | Completed - Results to ACI-NA, AAAE, ATA | |
| Task 11 | A Summary of How Proposed Firefighting Standards Would Impact Airports | GRA | 12/23/2008 | 6/15/2009 | Completed - Published as Web Document 7 and Research Results Digest 7 | |
| Task 12 | Ramp Incident Data from Selected Large and Medium Hub Airports | Ricondo & Associates | 4/17/2009 | 8/30/2011 | Completed - Results to FAA | |
| Task 13 | Research Symposium on the Transmission of Disease in Airports and on Aircraft | | | | Completed - Symposium Held - Results Published as Conference Proceedings 47 | |

TABLE 5 (continued)

| No. | Title | Contractor | Start Date | End Date | Status | Staff Officer |
|---------|--|-----------------------------|------------|------------|---|---------------|
| Task 14 | Helping Airports Understand the Payment Card Industry Data Protection Standard (PCI DSS) | Barich, Inc. | 10/15/2009 | 5/15/2010 | Completed - Published as Research Results Digest 11 | |
| Task 15 | Aviation Industry Familiarization and Training for Part-Time Airport Policymakers | Delta Aviation Consultants | 1/19/2010 | 11/18/2010 | Completed - Published as Report 58 | |
| Task 16 | Analysis, Scoping, and Prioritizing ACRP Deicing Problem Statements | | | | Cancelled | |
| Task 17 | Risk Assessment of Proposed ARFF Standards | Robert David & Assoc. | 2/19/2010 | 1/4/2011 | Completed - Published as Web-Only Document 12 | |
| Task 18 | The Carbon Market: A Primer for Airports | Pace Global Energy Services | 11/2/2010 | 8/30/2011 | Completed - Published as Report 57 | |
| Task 19 | Symposium on Air Travel and the Spread of Disease | | | | In Development | J. Navarrete |
| Task 20 | Developing Problem Statements on Information Technology Issues at Airports | Workshop conducted | 12/1/2011 | 12/1/2011 | Completed | T. Schatz |
| Task 21 | Innovative Airport Response to Threatened/Endangered Species | | | | In Development | M. Salamone |

TABLE 5 (continued)**ACRP PROJECT 11-03****Synthesis of Information Related to Airport Practices**

| No. | Title | Topic Consultant | Start Date | Status | FAA Liaisons | Staff Officer |
|--------------------------|--|-----------------------------|------------|---------------------------------------|-------------------------|---------------|
| 1: Administration | | | | | | |
| S01-01 | Innovative Finance and Alternative Sources of Revenue for Airports | Jacobs Consultancy | July 2006 | Completed - Published as Synthesis 1 | | |
| S01-02 | Airport Revenue Diversification | Lois Kramer, Kramer Aerotek | March 2009 | Completed - Published as Synthesis 19 | | |
| S01-03 | Airport Insurance Coverage and Risk Management Practices | Ron Rakich & Assoc. | April 2010 | Completed - Published as Synthesis 30 | | |
| S01-04 | Airline and Airport-Airline Consortiums | AvAir Pros | April 2010 | Completed - Published as Synthesis 31 | | |
| S01-05 | Synthesis of Airport Organizational Structures | | | In Development | E. Novak | G. Staba |
| S01-06 | Airport Customer Service Performance Metrics | | | In Development | D. Favarulo | G. Staba |
| S01-07 | Conducting Airport Peer Reviews | | | In Development | A. Velayos | G. Staba |
| 2: Environment | | | | | | |
| S02-01 | Effects of Airport Noise: Research Update on Selected Topics | Mestre Greve Associates | March 2007 | Completed - Published as Synthesis 9 | | |
| S02-02 | Airport Sustainability Practices | Arup | March 2007 | Completed - Published as Synthesis 10 | | |
| S02-03 | Compilation of Noise Programs in Areas Outside DNL 65 | HMMH | April 2008 | Completed - Published as Synthesis 16 | | |
| S02-04 | Approaches to Integrating Airport Development and Federal Environmental Review Processes | RS & H / Synergy | April 2008 | Completed - Published as Synthesis 17 | | |
| S02-05 | Funding Opportunities for Airport Environmental Projects | Unison Consulting | April 2010 | Completed - Published as Synthesis 24 | | |
| S02-06 | Airport Climate Adaptation and Resilience | AEA Group | April 2011 | Research in progress | T. Cuddy P. Magnotta | G. Staba |

TABLE 5 (continued)

| No. | Title | Topic Consultant | Start Date | Status | FAA Liaisons | Staff Officer |
|-------------------------------|--|---------------------------------|--------------|---------------------------------------|--------------------------------|---------------|
| S02-07 | Synthesis of Using Airport Contracts to Enhance Environmental Performance | | | In Development | K. Willis | G. Staba |
| S02-08 | Synthesis of Environmental Assessments of High Speed Rail in Air Corridors | | | In Development | R. Cointin H. Sweatt-Essick | G. Staba |
| S02-09 | Airport Environmental Management System Development Processes and Knowledge Gaps | | | In Development | M. Sedarous | G. Staba |
| 3: Policy and Planning | | | | | | |
| S03-01 | Aviation Forecasting Methodologies | GRA, Inc. | August 2006 | Completed - Published as Synthesis 2 | | |
| S03-02 | Airport Ground Access Mode Choice Models | Aviation Systems Consulting | October 2006 | Completed - Published as Synthesis 5 | | |
| S03-03 | Airport Economic Impact Methods and Models | Hoyle Tanner & Associates | March 2007 | Completed - Published as Synthesis 7 | | |
| S03-04 | Airport System Planning Practices | Wilbur Smith Associates | April 2008 | Completed - Published as Synthesis 14 | | |
| S03-05 | Effective Practices for Preparing Airport Improvement Program Benefit Cost Analysis | EDRG | April 2008 | Completed - Published as Synthesis 13 | | |
| S03-06 | Adaptive Reuse of Vacated On-Airport Facilities | Kramer Aerotek, Inc. | April 2010 | Completed - Published as Synthesis 25 | | |
| 4: Safety | | | | | | |
| S04-01 | General Aviation Safety and Security Practices | Reynolds, Smith and Hills, Inc. | October 2006 | Completed - Published as Synthesis 3 | | |
| S04-02 | Preventing Aircraft-Vehicle Incidents During Winter Operations and Periods of Low Visibility | Bowling Green State University | June 2007 | Completed - Published as Synthesis 12 | | |
| S04-03 | Identification of the Requirements and Training to Obtain Driving Privileges on Airfields | Airport Safety Consultants | May 2008 | Completed - Published as Synthesis 15 | | |

TABLE 5 (continued)

| No. | Title | Topic Consultant | Start Date | Status | FAA Liaisons | Staff Officer |
|---------------------------|--|---|------------|---------------------------------------|---------------|---------------|
| S04-05 | Bird Repellant Techniques on Airports | Mississippi St. Univ. | April 2010 | Completed - Published as Synthesis 23 | | |
| S04-06 | Current Airport Inspection Practices Regarding FOD | Prather Airport Solutions | April 2010 | Completed - Published as Synthesis 26 | | |
| S04-07 | Lessons Learned from Airport Safety Management Systems Pilot Study | Landry Consultants | April 2011 | Research in progress | K. Spencer | G. Staba |
| S04-08 | Managing Aerial Firefighting Activities on Airports | Critical Path International | May 2011 | Research in progress | M. Tonnacliff | G. Staba |
| S04-09 | Synthesis of Emergency Management and Mutual Aid Agreements for Airports | | | In development | G. Villalobos | G. Staba |
| 5: Security | | | | | | |
| S05-01 | Intelligent Transportation System (ITS) Sensor Technology for General Aviation | | | CANCELLED | | |
| 6: Human Resources | | | | | | |
| S06-01 | Aviation Workforce Development Practices | International Aviation Management Group | March 2009 | Completed - Published as Synthesis 18 | | |
| S06-02 | Airport Self-Inspection Practices | Prather Airport Solutions | May 2010 | Completed - Published as Synthesis 27 | | |
| S06-03 | Exploring Airport Employee Commuting and Parking Strategies | DMR Consulting | May 2011 | Research in progress | J. Breeden | G. Staba |
| S06-04 | Adapting New Maintenance Hires to the Airport Environment | | | In Development | G. Wilson | G. Staba |
| 8: Construction | | | | | | |
| S08-01 | Airport Terminal Facility Activation Techniques | Arup | March 2009 | Completed - Published as Synthesis 20 | | |

TABLE 5 (continued)

| No. | Title | Topic Consultant | Start Date | Status | FAA Liaisons | Staff Officer |
|-----------------------|--|--|--------------|---------------------------------------|---------------|---------------|
| 9: Maintenance | | | | | | |
| S09-01 | Impact of Rubber Removal Techniques on Runways | University of Oklahoma | June 2007 | Completed - Published as Synthesis 11 | | |
| S09-02 | Common Airport Pavement Maintenance Practices | Applied Research Associates | March 2009 | Completed - Published as Synthesis 22 | | |
| S09-03 | Subsurface Utility Engineering Information Management for Airports | J. H. Anspach Consulting | May 2011 | Research in progress | K. Kodsí | G. Staba |
| S09-04 | Issues with Use of Airfield LED Light Fixtures | RPI University | May 2011 | Research in progress | T. Mai | G. Staba |
| S09-05 | Repairing and Maintaining Airport Parking Structure While in Use | | | In Development | A. Cochran | G. Staba |
| 10: Operations | | | | | | |
| S10-01 | Counting Aircraft Operations at Non-Towered Airports | Aerofinity | October 2006 | Completed - Published as Synthesis 4 | | |
| S10-02 | Common-Use Facilities and Equipment at Airports | Barich, Inc. | March 2007 | Completed - Published as Synthesis 8 | | |
| S10-03 | Impact of Airport Deicing Products on Aircraft and Airfield Infrastructure | Montana State University, Western Transportation Institute | March 2007 | Completed - Published as Synthesis 6 | | |
| S10-04 | Airport Energy Efficiency and Cost Reduction | Miller Dunwiddie Architecture | March 2009 | Completed - Published as Synthesis 21 | | |
| S10-05 | Airport Ramp Safety Practices | Landry Consultants, LLC | May 2010 | Completed - Published as Synthesis 29 | | |
| S10-06 | Developing Energy Technologies and Their Effects on Airports | Harris, Miller, Miller & Hanson | May 2010 | Completed - Published as Synthesis 28 | | |
| S10-07 | Expediting Aircraft Recovery at Airports | Prather Airport Solutions | May 2011 | Research in progress | M. Tonnacliff | G. Staba |
| S10-08 | Conducting Aeronautical Events at Airports | | | In Development | B. Zeigler | G. Staba |

TABLE 5 (continued)

| No. | Title | Topic Consultant | Start Date | Status | FAA Liaisons | Staff Officer |
|--------|---|------------------|------------|----------------|--------------|---------------|
| S10-09 | Wildlife Deterrents Using Population Management at Airports | | | In Development | | |

NOTICE TO READERS

Information about project status is available on the ACRP World Wide Website at

www.trb.org/ACRP

Detailed project write-ups will be available only on the ACRP website.

HOW TO ORDER ACRP PUBLICATIONS FROM TRB

ACRP Publications are listed in Table 4.

ACRP reports, syntheses, research results digests, and legal research digests can be ordered with a credit card through the online TRB bookstore (<http://trb.org/bookstore>), by telephone (202-334-3213), or by fax (202-334-2519). We accept Visa, MasterCard, or American Express. TRB uses a secure web server; credit card numbers are encrypted for transmittal and erased from the system as soon as an order is processed.

To pay with a check, make your check payable to TRB and mail it with your order to:

National Academy of Sciences—TRB
PO Box 741494
Atlanta, GA 30374-1494

Payment must accompany all orders. Payments made by international check or money order must be payable in U.S. funds drawn on a U.S. bank. All taxes and duty are the responsibility of the customer.

TRANSPORTATION RESEARCH BOARD

500 Fifth Street, NW

Washington, DC 20001

ADDRESS SERVICE REQUESTED

NON-PROFIT ORG.
U.S. POSTAGE

PAID

WASHINGTON, D.C.
PERMIT NO. 8970

THE NATIONAL ACADEMIES™

Advisers to the Nation on Science, Engineering, and Medicine

The nation turns to the National Academies—National Academy of Sciences, National Academy of Engineering, Institute of Medicine, and National Research Council—for independent, objective advice on issues that affect people's lives worldwide.

www.national-academies.org



AP11