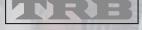


# ACRP

AIRPORT  
COOPERATIVE  
RESEARCH  
PROGRAM

## 2019 ANNUAL REPORT OF PROGRESS

The National Academies of  
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\* Membership as of November 2019.

\* Membership as of November 2019.

# ACRP

AIRPORT  
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TRANSPORTATION RESEARCH BOARD

## 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). ACRP carries out applied research on problems that are shared by airport operating agencies and not being adequately addressed by existing federal research programs. ACRP is modeled after the successful National Cooperative Highway Research Program (NCHRP) and Transit Cooperative Research Program (TCRP). ACRP undertakes research and other technical activities in various airport subject areas, including design, construction, legal, maintenance, operations, safety, policy, planning, human resources, and administration. ACRP provides a forum where airport operators can cooperatively address common operational problems.

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 (NASAQ), Airlines for America (A4A), and the Airport Consultants Council (ACC) as vital links to the airport community; (2) 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 Academy of Sciences formally initiating the program.

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 ACRP are solicited periodically but may be submitted to 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 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 users of the research: airport operating agencies, service providers, and academic institutions. ACRP produces a series of research reports for use by airport operators, local agencies, the FAA, and other interested parties; industry associations may arrange for workshops, training aids, field visits, webinars, and other activities to ensure that results are implemented by airport industry practitioners.

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The **National Academy of Sciences** was established in 1863 by an Act of Congress, signed by President Lincoln, as a private, non-governmental institution to advise the nation on issues related to science and technology. Members are elected by their peers for outstanding contributions to research. Dr. Marcia McNutt is president.

The **National Academy of Engineering** was established in 1964 under the charter of the National Academy of Sciences to bring the practices of engineering to advising the nation. Members are elected by their peers for extraordinary contributions to engineering. Dr. John L. Anderson is president.

The **National Academy of Medicine** (formerly the Institute of Medicine) was established in 1970 under the charter of the National Academy of Sciences to advise the nation on medical and health issues. Members are elected by their peers for distinguished contributions to medicine and health. Dr. Victor J. Dzau is president.

The three Academies work together as the **National Academies of Sciences, Engineering, and Medicine** to provide independent, objective analysis and advice to the nation and conduct other activities to solve complex problems and inform public policy decisions. The National Academies also encourage education and research, recognize outstanding contributions to knowledge, and increase public understanding in matters of science, engineering, and medicine.

Learn more about the National Academies of Sciences, Engineering, and Medicine at [www.national-academies.org](http://www.national-academies.org).

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The **Transportation Research Board** is one of seven major programs of the National Academies of Sciences, Engineering, and Medicine. The mission of the Transportation Research Board is to provide leadership in transportation improvements and innovation through trusted, timely, impartial, and evidence-based information exchange, research, and advice regarding all modes of transportation. The Board's varied activities annually engage about 8,000 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.

Learn more about the Transportation Research Board at [www.TRB.org](http://www.TRB.org).

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# Letter from AOC Chair

In an increasingly interconnected world, airports continue to play a critical role in communities across the globe. Rural and general aviation airports often provide the necessary link for the most remote places to goods and services, providing everything from basic transportation to access to essential medical care. From global cities to isolated counties, airports benefit nearly every sector of the population.

Since 2005, ACRP has successfully served the airport industry by eliciting research needs to address day-to-day challenges and then meeting those needs through a highly participatory process. Over the years, ACRP has built on this foundation with a highly rated webinar program, peer-to-peer engagement and mentoring programs like the ACRP Ambassador and Champion programs, as well as a user-friendly, informative, and accessible website.

2019 was an exciting year for ACRP—not only did the program publish its 200th research report, but it also had its first Champion graduate. In addition, ACRP continued its mission of growing its research product library and expanding its dissemination initiatives, including increased continued practitioner participation with IdeaHub as well as new and interesting Insight Events.

ACRP aims to share its research with as many practitioners as possible. Over the years, ACRP has expanded the platforms it uses to disseminate research and now uses several channels, with a focus on those that are web-based. This year ACRP continued to grow and expand these efforts to reach new practitioners and keep existing users updated and engaged.

This year's Annual Report of Progress provides a snapshot of ACRP's achievements and metrics to measure progress toward its mission. As you read this report, consider ways that you can get further involved with the program. Is there research you would like to see conducted? Perhaps you want to spread the word about ACRP and would like to learn more about its Ambassador program. Whatever your area of expertise, there is no time like the present to join with us and to be a part of this important program.

—Deborah Flint







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# Introduction

Flying across the globe is faster than any other mode of transportation: people and businesses increasingly rely on travel that starts and ends at airports to safely and efficiently move goods, travelers, and ideas from one side of the world to the other. In addition to linking destinations across the globe, airports are crucial in connecting rural communities—both to each other and to more distant cities. Rural and general aviation airports provide a vital connection for remote communities to access essential services and goods. From global cities to isolated counties, airports benefit nearly every sector of the population.

Since its establishment in 2005, the Airport Cooperative Research Program (ACRP) has helped foster and sustain these benefits by conducting applied research to help the airport industry address day-to-day challenges. In 2019, ACRP continued conducting high-quality, industry-driven research, disseminating the research to airport practitioners and other stakeholders, and engaging industry members in new and meaningful ways.

ACRP's *2019 Annual Report of Progress* describes the program's activities and accomplishments and how they encourage collaboration to address emerging challenges and foster professional networking across miles and generations. By presenting program metrics and practitioner feedback, the report describes ACRP's highlights and accomplishments.

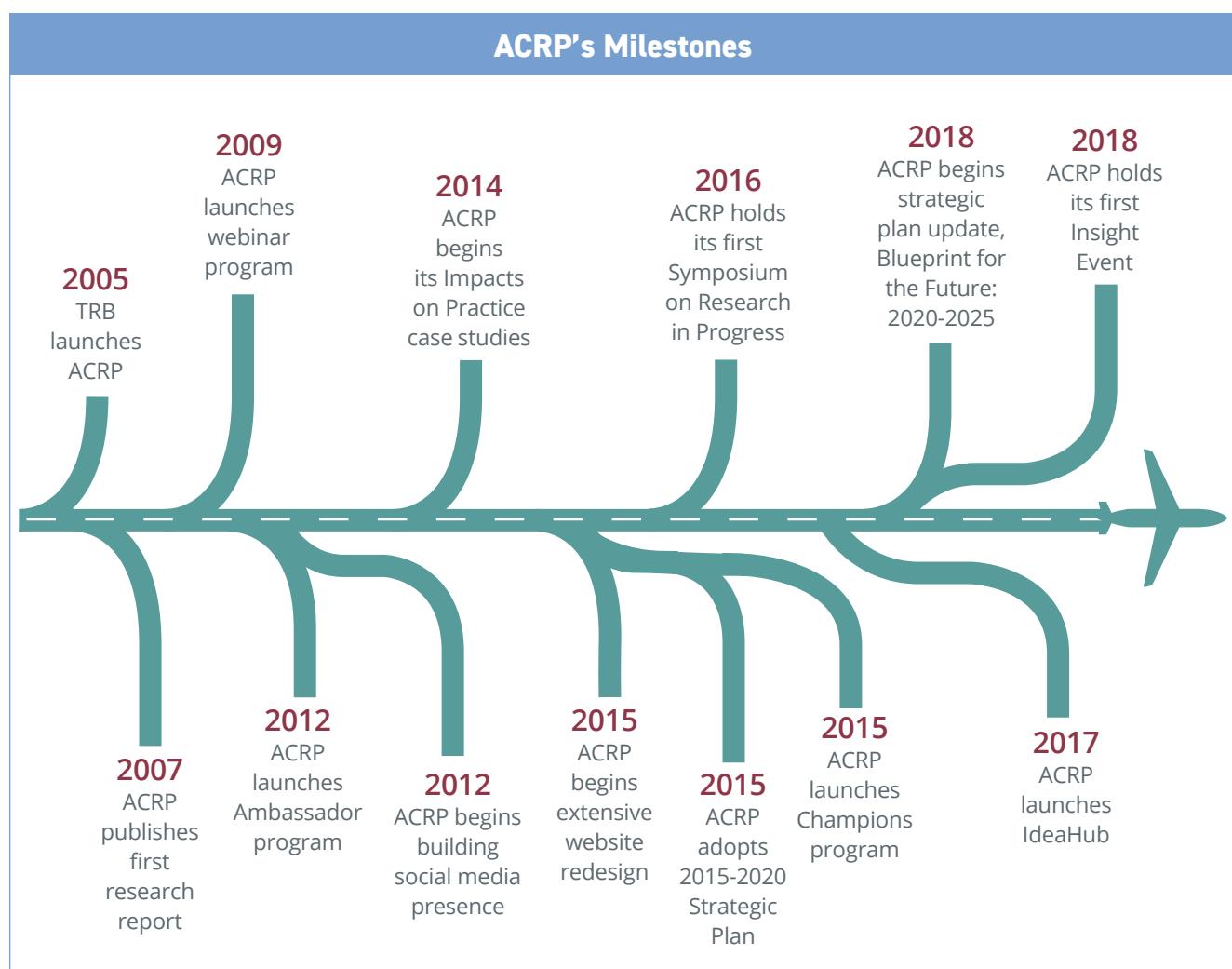
## WHAT IS ACRP?

ACRP is an applied research program managed by the Transportation Research Board, part of the National Academies of Sciences, Engineering, and Medicine, and sponsored by the Federal Aviation Administration. Together with public- and private-sector industry experts, ACRP produces myriad research products that cover a diverse set of topics: safety, policy and planning, airport design, construction, legal issues, operations and maintenance, human resources, sustainability, and administration



# Key Milestones in ACRP History

Since inception, ACRP has adapted and grown to meet industry needs and expand into new platforms. From the publication of the first research report to the creation and launch of IdeaHub, ACRP has continued to disseminate critical information and cultivate practitioner engagement in innovative ways.





## Meet ACRP

### **Marci A. Greenberger, ACRP Program Manager**

Marci A. Greenberger is the ACRP Program Manager and has worked with the Transportation Research Board of the National Academies since 2008. Prior to becoming the Program Manager, she served as a Senior Program Officer (SPO) managing projects on operations, maintenance, safety, and security, as well as legal issues that affect the industry. Before joining ACRP, she spent more than 18 years in airport operations and management in senior executive positions at airports in Rhode Island, Indiana, and California. Ms. Greenberger is an Accredited Airport Executive by the American Association of Airport Executives (AAAE), holds a BS in Aviation Management from The Ohio State University, and earned an MBA from California State University-Northridge.



### **Matthew Griffin**

Matthew Griffin is one of the newest member of the ACRP team, joining the staff as an SPO in October 2019. He previously served as the Director of Regulatory Affairs and Education at the Airports Consultants Council. His history also includes having been the Senior Manager for Policy and Regulatory Affairs at Airports Council International—North America and time spent with the Capital Region Airport Authority in Lansing, Michigan. Before joining the staff, Matthew had the pleasure of serving on various ACRP panels. Matthew holds a BS in Aviation Management from Purdue University as well as a private pilot's certificate.



### **Lawrence D. Goldstein**

Lawrence Goldstein is an SPO and manages research projects across the Cooperative Research Programs at the Transportation Research Board. He has been with The National Academies for more than 10 years, and his recent ACRP studies include research on resilience, changes in competitive travel demand, wetland mitigation, and evolving application of benefit-cost analysis. Before joining ACRP, he specialized in transportation system financial and economic analysis for more than 35 years. Lawrence received his BA in Physics and Mathematics from Columbia College, his MA in Astronomy from Columbia University, and his MURP from George Washington University.





### **Joseph Navarrete**

Joe Navarrete joined ACRP as an SPO in 2009, bringing experience as both a principal investigator and panelist on ACRP projects from his previous job at a large consulting firm. Joe's background is in airport planning for both large and small airports across the country. He began his career at the Metropolitan Washington Council of Governments, and he served as the chief of airport system planning for the Maryland Aviation Administration. As an SPO, Joe particularly enjoys facilitating the collaborative research process that is the hallmark of ACRP. Joe holds a BA in Geography and a certificate in Cartography from George Mason University.

### **Theresia Schatz**

Theresia Schatz is an ACRP SPO with more than 30 years of aviation industry experience. Before managing research projects for ACRP, she worked for The Port Authority of New York and New Jersey in various supervisory and managerial positions entailing airport operations, administration, and property management at JFK, Newark Liberty, and LaGuardia airports. She is an Accredited Airport Executive through AAAE and holds a BS in Aviation Management from the Florida Institute of Technology, an MBA from Baruch College, City University of New York, and an AAS in Aerospace Technology from Farmingdale College, State University of New York.



### **Gail Staba**

Gail Staba is an ACRP SPO and is responsible for facilitating the program's Synthesis studies. Gail brings more than 20 years of experience in transportation planning and environmental management at ports and airports. Her prior experience includes airport planning and environmental consulting in California and work on airport planning, ground transportation, and facilities maintenance management teams at Oakland Airport, San Francisco Airport, Port of Oakland, and Vandenberg Air Force Base Spaceport. Gail holds a BS in Environmental Planning and Policy from the University of California, Davis, and an MS in Transportation Engineering from the University of California, Berkeley.



## Overview of Key Accomplishments

2019 was an exciting year for ACRP—from publishing its 200th research report to having its first Champion graduate—the program continued to grow its research product library and expand its dissemination initiatives. This year marked several new accomplishments and built on past successes with IdeaHub, Insight Events, and the website redesign.

This year, ACRP received nearly 80 problem statements from a wide range of stakeholders including airport operators, industry associations, federal and state transportation agencies, universities, and aviation consultants. These problem statements address different types of airports and their needs, encompassing a variety of topics such as encouraging and sustaining a culture of innovation at airports, calculating runway length requirements for general aviation airports, and combatting human trafficking at airports.

In response to these problem statements, ACRP committed more than \$7 million to support new research projects in 2019, which will yield new resources for airport practitioners. This investment will bring the total amount of project funding since 2005 to more than \$140 million. Ultimately, projects undertaken in 2019 will bring the number of ACRP projects authorized since 2006 to more than 600.

**Cumulative Funding and Projects by ACRP Research Area Since 2005**

| # of projects | Funding       | Research topic       | Percentage of total |
|---------------|---------------|----------------------|---------------------|
| 47            | \$17,220,000  | 1: Administration    | 12                  |
| 99            | \$35,380,000  | 2: Environment       | 24                  |
| 59            | \$22,390,000  | 3: Policy & Planning | 15                  |
| 26            | \$8,480,000   | 4: Safety            | 6                   |
| 2             | \$650,000     | 5: Security          | <1                  |
| 8             | \$2,570,000   | 6: Human Resources   | 2                   |
| 18            | \$6,770,000   | 7: Design            | 5                   |
| 3             | \$750,000     | 8: Construction      | 1                   |
| 20            | \$6,790,000   | 9: Maintenance       | 5                   |
| 29            | \$10,870,000  | 10: Operations       | 7                   |
| 323           | \$33,130,000  | 11: Special Projects | 23                  |
| 634           | \$145,000,000 |                      |                     |

In 2019, ACRP published 42 research products (reports, digests, syntheses, web-only documents, WebResources, and conference proceedings) covering a wide range of topics relevant to airports.

| 2019 Publications by Type   |    |
|---|----|
| <i>Conference Proceedings and Conference Proceedings on the Web</i> | 3  |
| <i>Legal Research Digests</i>                                       | 1  |
| <i>Research Reports</i>   | 18 |
| <i>Research Results Digests</i>                                     | 1  |
| <i>Syntheses</i>  | 12 |
| <i>Web-Only Documents</i>   | 6  |
| <i>WebResources</i>   | 1  |
| <i>Total</i>  | 42 |



## NOTEWORTHY PUBLICATIONS

ACRP research has wide-reaching domestic and international impact. In 2019, practitioners downloaded the following reports more than any other ACRP publications. All download data comes from the National Academies Press's NAXchange site: [naxchange.nap.edu](https://naxchange.nap.edu).

### Research Reports

| Top 5 Most Downloaded FY2019 Research Reports  | Downloads |
|--|-----------|
| ACRP Research Report 16: Guidebook for Managing Small Airports (1st & 2nd Edition)                       | 2,196     |
| ACRP Research Report 25: Airport Passenger Terminal Planning and Design, Volume 1: Guidebook             | 2,066     |
| ACRP Research Report 191: A Primer to Prepare for the Connected Airport and the Internet of Things       | 1,277     |
| ACRP Research Report 190: Common Performance Metrics for Airport Infrastructure and Operational Planning | 1,195     |
| ACRP Research Report 189: Design Considerations for Airport EOCs   | 968       |

### Syntheses

| Top 5 Most Downloaded FY2019 Syntheses  | Downloads |
|---|-----------|
| ACRP Synthesis 97: How Airports Plan for Changing Aircraft Capacity: The Effects of Upgauging | 377       |
| ACRP Synthesis 91: Microgrids and Their Application for Airports and Public Transit           | 359       |
| ACRP Synthesis 93: Sustainability's Role in Enhancing Airport Capacity                        | 312       |
| ACRP Synthesis 66: Lessons Learned from Airport Sustainability Programs                       | 255       |
| ACRP Synthesis 63: Overview of Airport Fueling Operations                                     | 211       |

### Legal Research Digests

| Top 5 Most Downloaded FY2019 Legal Research Digests   | Downloads |
|---|-----------|
| ACRP Legal Research Digest 32: Evolving Law on Airport Implications by Unmanned Aerial Systems                          | 260       |
| ACRP Legal Research Digest 33: Overview of Airport Duties and Standards of Care in Airfield Accident Cases              | 145       |
| ACRP Legal Research Digest 35: Legal Considerations in the Funding and Development of Intermodal Facilities at Airports | 132       |
| ACRP Legal Research Digest 31: Preemption of Worker-Retention and Labor-Peace Agreements at Airports                    | 119       |
| ACRP Legal Research Digest 34: Airport Public Health Preparedness and Response: Legal Rights, Powers, and Duties        | 92        |



# ACRP Strategic Initiatives Update

## DIGITAL ENGAGEMENT AND DISSEMINATION

ACRP aims to share its research with as many practitioners as possible. Over the years, ACRP has expanded the platforms it uses to disseminate research and now uses several channels, with a focus on those that are web-based. This year ACRP continued to grow and expand these efforts to reach new practitioners and keep existing users updated and engaged.

### IdeaHub

IdeaHub is a collaborative online platform for airport practitioners to generate and share ideas and eventually turn them into problem statements with the goal of receiving ACRP research funding. IdeaHub's interactive design aims to foster collaboration among practitioners and improve research ideas through engagement and discussion. Problem statements must identify an issue, describe research needs, and justify how the research will help the airport industry.

During IdeaHub's second year, ACRP refined the platform's design and created new features based on user feedback. These improvements include allowing idea submitters to automatically "own" their ideas, reducing the number of fields required to submit a problem statement, and creating tags to identify and organize idea subject areas. In its inaugural year, 615 people joined the IdeaHub community. ACRP added more than 200 new members in 2019. For fiscal year 2020, 19 projects from 77 problem statements were chosen to receive funding.



*The ACRP Oversight Committee (AOC) met in July to determine which problem statements to fund as research projects.*

| IdeaHub: Key Metrics   |                   |                   |       |
|--|-------------------|-------------------|-------|
| Metric   | 2018 <sup>1</sup> | 2019 <sup>1</sup> | Total |
| <b>Ideas Shared<sup>2</sup></b>  |                   |                   |       |
| Research   | 107               | 73                | 180   |
| Syntheses  | 22                | 23                | 45    |
| <i>Total</i>   | 129               | 96                | 225   |
| <b>Comments</b>  |                   |                   |       |
| Research   | 295               | 132               | 427   |
| Syntheses  | 64                | 36                | 100   |
| <i>Total</i>   | 359               | 168               | 527   |
| <b>Problem Statements/Topics Submitted for Funding Consideration<sup>3</sup></b> |                   |                   |       |
| Problem Statements   | 55                | 77                | 132   |
| Synthesis Topics   | 26                | 29                | 55    |
| <i>Total</i>   | 81                | 106               | 187   |
| <b>Community Members</b>   | 615               | 215               | 830   |

<sup>1</sup> Twelve months ending in September.

<sup>2</sup> New research ideas/synthesis topics added.

<sup>3</sup> Includes resubmitted problem statements/synthesis topics.



## Webinars

ACRP webinars cover a variety of topics and aim to present research findings to practitioners across the country. Webinars feature Principal Investigators (PIs) and research teams who discuss their findings with a large audience of airport practitioners. The ACRP team and PIs work collaboratively to create relevant and engaging presentations.

| Webinars: Key Metrics                   |  |   |   |
|---|--|---|---|
| Number of webinars hosted in 2019<br>18 | Average webinar satisfaction rating (2011-2019)<br>91% | Practitioners who have attended at least one webinar in 2019<br>2,257 | Practitioners reached since 2011<br>22,817<br>(includes repeat attendees) |

**"I enjoyed the topics of this webinar as they have rekindled a motivation within myself and my co-workers who also participated. This has renewed our sense of purpose on this particular topic."**

— Feedback on Digitize Your Checklists—Computerized Airport Maintenance Management webinar

**"TRB (ACRP), as always, makes a tremendously important contribution in all those technical aspects related to the value chain of the operating system of an airport. It is very helpful to attend the webinars...[and] review and study their related publications."**

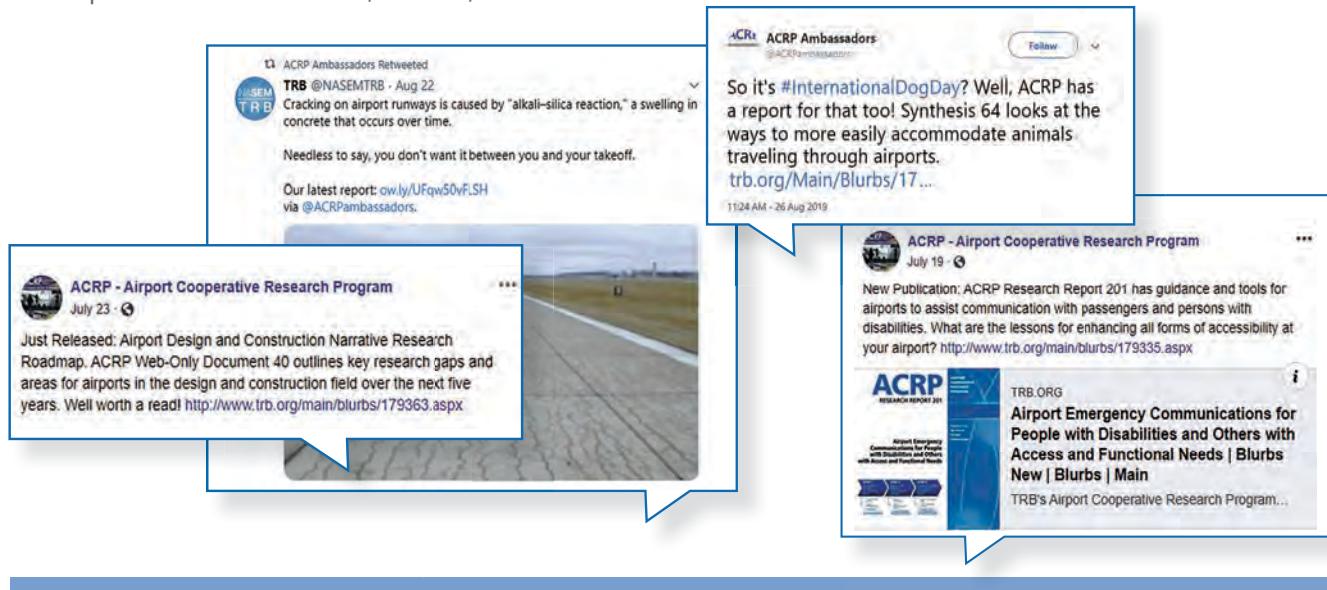
— Feedback on More Than Recycling—Best Practices in Airport Waste Management webinar

**"I thought both presenters were very knowledgeable and engaging. I appreciated that one came from a technical background and another came from more of a management background—both had perspectives that were valuable."**

— Feedback on Energetic Value: The Design and Economics of Microgrids at Airports webinar

## Social Media

Social media provides a relevant and accessible platform for ACRP to reach new practitioners and stakeholders, engage with its existing network, and highlight events and accomplishments. ACRP maintains an active presence on Facebook, Twitter, and LinkedIn.



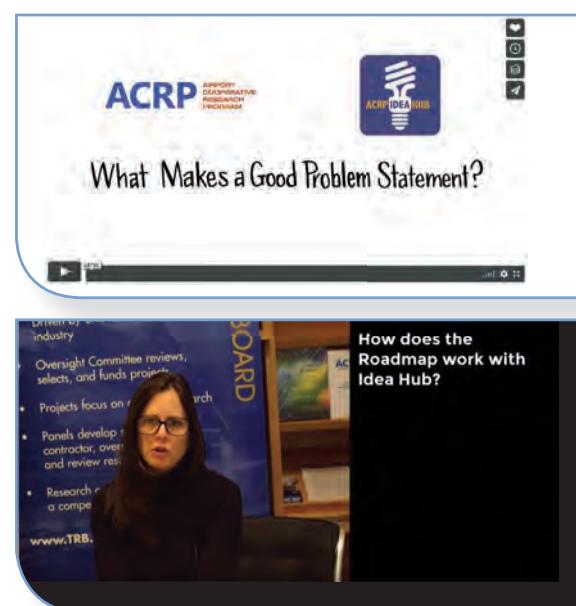
## Social Media: Key Metrics

| Twitter engagement  | Twitter impressions  | Facebook reach  |
|---|--|---|
| <i>The number of interactions a Tweet receives</i><br>322 | <i>The number of times a Tweet is displayed online</i><br>26,937 | <i>The number of unique users who see a post or page</i><br>6,956 |

## Videos

ACRP uses videos to spread research and information in a different and engaging way. In 2019, ACRP expanded its "ACRP Chats With" series, where industry professionals provided an in-depth look at a specific topic. Some of ACRP's video offerings include the following:

- What Makes a Good ACRP Problem Statement?** is a short, whiteboard animation video on the criteria that makes a good problem statement. Using animation video overlays that help illustrate the narration, the video discusses how the ACRP Oversight Committee (AOC) reviews problem statements and provides funding to a select group of projects. The four criteria that the AOC considers are the project's applicability, achievability, implementation, and understandability.
- ACRP Chats with Katherine Preston on ACRP Roadmaps** is an interview with Katherine Preston, a principal consultant with HMMH. Preston discusses the recent completion of two ACRP roadmap projects: "Design and Construction of Airport Facilities" and "Airport Operations and Maintenance." A research roadmap identifies problems or challenges that industry stakeholders share, and problem statements developed from research roadmaps will likely garner greater AOC support, as the industry has already established the need for a solution.



## Website

ACRP's website is a complete repository in which practitioners and stakeholders can find information on all program activities. The website is integral for providing up-to-date program information, announcing events and deadlines, and accessing ACRP research and other publications. ACRP continues to improve its website, which, in 2018, underwent a comprehensive overhaul that included a new design, user-friendly navigation, and enhanced search functionality. Throughout 2019, ACRP has continued to refine content, transition pages from the old web design to the new one, create new web banners, and improve search optimization.



Publications - Read ACRP's most downloaded publications. They're popular for good reason.

**Publications**  
ACRP publications contain the findings of individual research projects managed by...

**Projects**  
View all active and completed projects of the ACRP. All ACRP research ideas are...

**Subprograms**  
Legal, Synthesis, Insight Events, Univ. Students, Ambassadors and Champions.

**Getting Involved**  
For Project Panel Volunteers, Proposers, and Contractors

## AIRPORT COOPERATIVE RESEARCH PROGRAM

Sponsored by the Federal Aviation Administration

Learn about About ACRP >>

## PEER-TO-PEER OUTREACH

In addition to disseminating research online, ACRP runs two programs that foster in-person communication and engagement—the ACRP Ambassador program and the ACRP Champion program. The Ambassador and Champion programs target different sectors of aviation professionals and offer opportunities to meet new industry members and share ACRP research products.

### Champions

The ACRP Champion program provides learning and professional development opportunities to early- to mid-career professionals. An ACRP Champion, sponsored by his or her respective organization, completes a series of "missions" designed to build knowledge and drive engagement in ACRP's research and dissemination activities.

This year, Amber Leathers, a senior planner at Charlotte Douglas International Airport (CLT), became the first Champion to complete all missions. To celebrate Amber's accomplishment, ACRP held a luncheon at CLT, where ACRP staff presented Amber with a certificate of completion.

Also this year, ACRP began enhancing the Champion program to clarify



Champion Luncheon photo (L:R): Marci A. Greenberger, Manager, ACRP; Amber Leathers, Senior Planner, CLT; Jack Christine, Chief Operating Officer, CLT

objectives, remove obstacles that have impeded Champions' progress, and create more valuable activities. The program redesign also aims to add prestige and recognition for those who complete the entire program, as well as keep practitioners engaged long-term in ACRP research activities and dissemination.

To accomplish these goals, ACRP developed a new online Champions portal to allow the Champions to obtain new missions and track their progress more easily. Once launched, users will create an online profile within the Champions portal that will help them connect and network with fellow Champions and collaborate to complete various missions and activities. Champions will be able to move around, within, and across missions and report on these activities as they complete them.

## Ambassadors

ACRP Ambassadors are a select group of experienced airport professionals that help amplify ACRP's reach. Ambassadors attend conferences around the United States and Canada, staffing exhibits and presenting ACRP research. In 2019, 17 ambassadors reached more than 4,000 practitioners in 18 different states and provinces.

| Ambassadors: Key Metrics  |        |
|---|--------|
| <b>ACRP Ambassadors</b>   | 17     |
| <b>States and provinces where Ambassadors have attended conferences</b> | 23     |
| <b>Airport industry events attended by Ambassadors</b>                  | 23     |
| <b>Practitioners reached by Ambassadors (since 2012)</b>                | 39,542 |



*2019 Ambassadors (Left to right.) Top row: Aaron Davis, Paul Khera, Daphne Fuller, Andrew Perelson. Middle row: Jean Mongillo, Brenda Enos, Tom Anderson, Amber Fuller, John Walewski. Bottom row: Tara Harl, Nathan Cuvala, Adam Cohen, Erin Cooke.*

## IMPACTS ON PRACTICE

ACRP's Impacts on Practice (IOP) series highlights airport industry practitioners who have used ACRP research results to assist with their work. ACRP publications cover a wide range of topics and can help improve airport administrative practices, develop safer and more effective operational techniques, and increase performance efficiency. ACRP administers surveys to learn how airports across the country implement its research and uses the responses to identify which leads to pursue and develop into a full case study. In recent years, ACRP has received hundreds of survey responses and testimonials.

In 2019, ACRP published four IOPs, including a special feature on how the FAA and ACRP work together, which is summarized below.

*ACRP and FAA: Working Together to Help the Airport Industry* describes how ACRP research and FAA guidelines fill distinct but equally important roles in serving the airport community. To develop this IOP, ACRP worked closely with the FAA, interviewing staff from various divisions, reviewing FAA guidelines, and discussing ideas for future collaboration. This one-of-a-kind IOP features an enhanced design with a two-page spread, informative callout boxes, and key quotations.

**"I like having the ability to cross-reference ACRP and FAA guidance, which in turn validates ACRP."**

— Feedback from IOP interview with FAA

**"The diversity and array of information available at ACRP is second to none."**

— Feedback from IOP interview on *ACRP Research Report 182: Guidance for Planning, Design, and Operations of Airport Communications Centers*

**"I wouldn't be able to work without the information I've gotten from this library of publications about airports."**

— Feedback from IOP interview on *ACRP Report 58: Airport Industry Familiarization and Training for Part-Time Airport Policy Makers*

## BLUEPRINT FOR THE FUTURE: 2020–2025

The ACRP Oversight Committee (AOC) developed a 5-year strategic plan for ACRP that was adopted in 2015. In October of 2018, the AOC asked ACRP staff to begin an update of that plan and is expected to adopt the new plan, "Blueprint for the Future: 2020–2025" in January 2020.

The strategic plan update began with a look back at the current plan to identify what had been achieved. One of the many accomplishments borne from the first plan was the development and implementation of IdeaHub, ACRP's successful problem statement collaboration tool. Another accomplishment was the compilation of qualitative and quantitative information on airports using ACRP products, which led to the first 5-Year Research Impact Report. This report identified that downloads have increased 44 percent since 2010. ACRP also successfully launched the young professional Champion program to engage and connect with younger audiences and those in the early stages of their careers. In addition, and among many other accomplishments, ACRP has greatly increased its visibility through social media.

For the new strategic plan, the AOC identified strategic goals and objectives with the overarching priority of engaging stakeholders. The AOC has also ensured that the "Blueprint for the Future: 2020–2025" is consistent with the TRB strategic plan. ACRP staff has identified action items to meet those strategic plan objectives, and the AOC will provide feedback on the most important priorities to begin implementing in years 1 and 2.



## ACRP Activities

ACRP engages industry practitioners through interactive events, programs, and competitions. Throughout 2019, ACRP continued to grow these efforts to connect with all stakeholders, from seasoned industry executives to graduate and undergraduate researchers.

### INSIGHT EVENTS

ACRP launched the Insight Event series in 2018 to provide opportunities for airport practitioners to gather around an evolving issue or challenge and examine it through idea exchange and face-to-face learning. The one- to two-day events feature subject matter experts from the airport industry and beyond to promote communication, collaboration, and innovation and to help identify future areas of research interest.

In 2019, ACRP convened its fourth Insight Event, *Public-Private Partnerships—What Are the Lessons Learned?*, to help airport managers and operators better understand key characteristics and considerations for public-private partnerships (P3s). The event brought together airport industry leaders, academic experts, consultants, and other stakeholders to discuss the current landscape of airport P3s. The event also took a detailed look at challenges, opportunities, lessons learned, and best practices across the P3 process from pre-procurement through financial close. Presenters drew from their firsthand experiences pursuing P3s for airports in the United States and shared lessons they learned along the way.

Three additional ACRP Insight Events are being planned for 2020: *A Forum on Blockchain Technology and Airports*, *the Future of Aviation*, and *On-Demand Aviation Services for Passengers and Goods*.



*The Insight Event Public-Private Partnerships—What Are the Lessons Learned? took place in July 2019 at the Keck Center.*

## UNIVERSITY DESIGN COMPETITION

The ACRP University Design Competition serves as a platform for students to address issues related to airports and the National Airspace System. The competition challenges individuals and teams of undergraduate and/or graduate students to create design solutions in the following broad areas: airport operation and maintenance; runway safety/runway incursions/runway excursions; airport environmental interactions; and airport management and planning. Students can win cash prizes, and first place winners present their work at a national award ceremony.

In 2019, more than 50 teams presented their work. The following teams received honors:

**Civil and Environmental Engineering Department at the University of California, Berkeley**, *Smart Gate System for 400Hz Power Monitoring at Airports*—First place, airport environmental interactions.

**School of Aviation and Transportation Technology at Purdue University**, *Augmented Reality Airport Training System*—First place, airport operation and maintenance.

**Aviation Institute at the University of Nebraska at Omaha**, *IoT in the Cockpit: Intelligent Runway Status Indication System (IRSIS)*—First place, runway safety/runway incursions/runway excursions.

**Edward J. Bloustein School of Planning and Public Policy at Rutgers University**, *Addressing Airport Congestion as Traffic Takes Off in the Age of Uber and Lyft*—First place (tie), airport management and planning.

**School of Aviation and Transportation Technology at Purdue University**, *Proposal of Mobile Application Design for Aging Travelers in Commercial Airports*—First place (tie), airport management and planning.



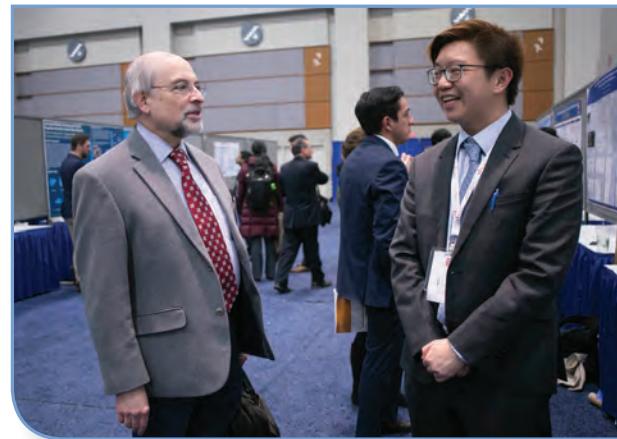
*2019 University Design Competition participants at the Keck Center*

## ACRP GRADUATE RESEARCH AWARDS

The ACRP Graduate Research Awards provide an opportunity to engage graduate students, who are likely to become future managers, operators, designers, and policy makers in aviation. The graduate research program encourages applied research on airport and related aviation system issues to help the public sector continue to improve the quality, reliability, safety, and security of the civil aviation system. In 2019, 11 students out of more than 30 diverse and competitive applicants received ACRP funding to conduct unique research projects. The award winners present their papers at the TRB Annual Meeting and are considered for publication in the *Transportation Research Record: Journal of the Transportation Research Board*.

The 2019 award winners' projects are listed below:

- *Automatic Communication Error Detection Using Speech Recognition and Linguistic Analysis for Proactive Control of Loss of Separation*
- *Impact of Utilizing Electric Ground Power Systems on Airport Electricity Demand Profile*
- *Evaluation of Airport Wayfinding Accessibility with the Use of a Wheelchair Simulator*
- *BIM Implementation Framework for Smart Airport Life Cycle Management*
- *Impacts of Shared Automated Vehicles on Airport Access and Operations, with Opportunities for Revenue Recovery: Case Study of Austin, Texas*
- *Airport Operational Sustainability: A Multiple-Case Study of U.S. General Aviation Airports*
- *Optimization of Takeoff Departure Procedures for Airport Noise Mitigation*
- *What Determines the Valuation of Airport Bonds?*
- *Investigation of Piezoelectric Energy Harvesting Potential at Airport for Green Energy Solutions*
- *Evaluating the Interoperability of Urban Air Mobility Systems and Airports*



ACRP SPO Larry Goldstein (left) speaking with Graduate Research Awards presenter Jason Wong of Columbia University (right) at the 2019 TRB Annual Meeting.



# Appendix A: Publications of the Airport Cooperative Research Program

## Research Reports

| No. | Proj. No.  | Title, Pages, Publication Year  |
|-----|------------|---|
| 1   | 11-02/Task | 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 | 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 | Ground Access to Major Airports by Public Transportation, 214 p. (2008)   |
| 5   | 11-02/Task | 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)                          |
| 14  | 02-71      | Deicing Planning Guidelines and Practices for Stormwater Management Systems, Second Edition: (In Production)        |
| 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)  |
| 16  | 01-32      | Guidebook for Managing Small Airports, Second Edition: (& WR 6), 362 p. (2019)                                      |
| 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-Measurement 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) |

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| Research Reports |            |   |
|------------------|------------|---|
| No.              | Proj. No.  | Title, Pages, Publication Year  |
| 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)   |
| 37               | 03-06      | Guidebook for Planning and Implementing Automated People Mover Systems at Airports (& CD 82), 226 p. (2010)                       |
| 37A              | 03-07      | Guidebook for Measuring Performance of Automated People Mover Systems at Airports, 134 p. (2012)                                  |
| 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), 158 p. (2011)             |
| 57               | 11-02/Task | The Carbon Market: A Primer for Airports, 80 p. (2011)  |
| 58               | 11-02/Task | Airport Industry Familiarization and Training for Part-Time Airport Policy Makers, 64 p. (2011)                                   |
| 59               | 01-12      | Information Technology Systems at Airports: A Primer, 108 p. (2012)   |
| 60               | 02-18      | Guidelines for Integrating Alternative Jet Fuel into the Airport Setting, 136 p. (2012)   |
| 61               | 10-09      | Elimination or Reduction of Baggage Recheck for Arriving International Passengers, 142 p. (2012)                                  |
| 62               | 04-07      | Airport Apron Management and Control Programs, 64 p. (2012)   |
| 63               | 02-03A     | Measurement of Gaseous HAP Emissions from Idling Aircraft as a Function of Engine and Ambient Conditions, 112 p. (2012)           |
| 64               | 02-25      | Handbook for Evaluating Emissions and Costs of APUs and Alternative Systems (& CD 113), 90 p. (2012)                              |
| 65               | 10-10      | Guidebook for Airport Irregular Operations (IROPS) Contingency Planning, 258 p. (2012)  |
| 66               | 01-14      | Considering and Evaluating Airport Privatization (& CD 109), 124 p. (2012)  |

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| Research Reports |           |   |
|------------------|-----------|---|
| No.              | Proj. No. | Title, Pages, Publication Year  |
| 67               | 03-14     | Airport Passenger Conveyance Systems Planning Guidebook (& CD 110), 68 p. (2012)  |
| 68               | 07-07     | Guidebook for Evaluating Terminal Renewal Versus Replacement Options (& CD 112), 152 p. (2012)  |
| 69               | 01-16     | Asset and Infrastructure Management for Airports: Primer and Guidebook, 136 p. (2012)   |
| 70               | 10-08     | Guidebook for Implementing Intelligent Transportation Systems Elements to Improve Airport Traveler Access Information (& CD 114), 138 p. (2012) |
| 71               | 02-08     | Guidance for Quantifying the Contribution of Airport Emissions to Local Air Quality (& CD 115), 76 p. (2012)                                    |
| 72               | 02-14     | Guidebook for Selecting Methods to Monitor Airport and Aircraft Deicing Materials, 276 p. (2012)  |
| 72               | 02-61     | Guidebook for Selecting Methods to Monitor Airport and Aircraft Deicing Materials, Second Edition, 128 p. (2017)                                |
| 73               | 04-10     | Airport-to-Airport Mutual Aid Programs, 192 p. (2012)   |
| 74               | 01-18     | Application of Enterprise Risk Management at Airports (& CD 117), 72 p. (2012)  |
| 75               | 06-02     | Airport Leadership Development Program (& CD 133), 334 p. (2013)  |
| 76               | 03-22     | Addressing Uncertainty about Future Airport Activity Levels in Airport Decision Making, 152 p. (2012)   |
| 77               | 01-17     | Guidebook for Developing General Aviation Airport Business Plans (& CD 119), 174 p. (2012)  |
| 78               | 02-16     | Airport Ground Support Equipment (GSE): Emission Reduction Strategies, Inventory, and Tutorial (& CD 123), 114 p. (2012)                        |
| 79               | 03-17     | Evaluating Airfield Capacity (& CD 124), 172 p. (2012)  |
| 80               | 02-22     | Guidebook for Incorporating Sustainability into Traditional Airport Projects (& CD 125), 104 p. (2012)  |
| 81               | 02-19     | Winter Design Storm Factor Determination for Airports, 60 p. (2012)   |
| 82               | 03-12     | Preparing Peak Period and Operational Profiles—Guidebook (& CD 126; & WOD 14), 146 p. (2013)  |
| 83               | 02-36     | Assessing Opportunities for Alternative Fuel Distribution Programs (& CD 129), 128 p. (2013)  |
| 84               | 02-21     | Guidebook for Preparing Airport Emissions Inventories for State Implementation Plans (& CD 131), 68 p. (2013)                                   |
| 85               | 03-21     | Developing and Maintaining Support for Your Airport Capacity Project, 40 p. (2013)  |
| 86               | 02-12     | Environmental Optimization of Aircraft Departures: Fuel Burn, Emissions, and Noise (& CD 136), 104 p. (2013)                                    |
| 87               | 01-20     | Procuring and Managing Professional Services for Airports, 120 p. (2013)  |
| 88               | 04-11     | Guidebook on Integrating GIS in Emergency Management at Airports (& CD 139), 138 p. (2013)  |
| 89               | 02-24     | Guidelines for Airport Sound Insulation Programs, 324 p. (2013)   |
| 90               | 03-25     | Impact of Regulatory Compliance Costs on Small Airports (& WOD 15 Vol. 1; & WOD 15 Vol. 2), 92 p. (2013)  |
| 91               | 02-20A    | Infectious Disease Mitigation in Airports and on Aircraft, 38 p. (2013)   |
| 92               | 10-11     | Guidebook to Creating a Collaborative Environment Between Airport Operations and Maintenance, 148 p. (2013)                                     |
| 93               | 03-18     | Operational and Business Continuity Planning for Prolonged Airport Disruptions (& CD 140), 152 p. (2013)  |
| 94               | 04-12     | Integrating Web-Based Emergency Management Collaboration Tools into Airport Operations—A Primer, 56 p. (2013)                                   |
| 95               | 04-13     | Integrating Community Emergency Response Teams (A-Certs) at Airports, Basic Training Instructor Guide: , 52 p. (2013)                           |
| 95               | 04-13     | Integrating Community Emergency Response Teams (A-Certs) at Airports, Basic Training Student Guide: , 40 p. (2013)                              |
| 95               | 04-13     | Integrating Community Emergency Response Teams (A-Certs) at Airports, What Is CERT and How Do I Use It?: , 72 p. (2013)                         |
| 96               | 07-09     | Apron Planning and Design Guidebook, 168 p. (2013)  |
| 97               | 02-17     | Measuring PM Emissions from Aircraft Auxiliary Power Units, Tires, and Brakes, 52 p. (2013)   |
| 98               | 03-26     | Understanding Airline and Passenger Choice in Multi-Airport Regions, 100 p. (2013)  |
| 99               | 02-29     | Guidance for Treatment of Airport Stormwater Containing Deicers, 330 p. (2013)  |
| 100              | 02-15     | Recycling Best Practices—A Guidebook for Advancing Recycling from Aircraft Cabins, 86 p. (2014)   |
| 101              | 09-02     | Best Practices Manual for Working In or Near Airport Movement Areas (& CD 150), 62 p. (2014)  |
| 102              | 02-33     | Guidance for Estimating Airport Construction Emissions (& CD 142), 138 p. (2014)  |

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## Research Reports

| No. | Proj. No.  | Title, Pages, Publication Year   |
|-----|------------|--|
| 103 | 10-13      | A Guidebook for Integrating NIMS for Personnel and Resources at Airports, 128 p. (2014)  |
| 104 | 03-20      | Defining and Measuring Aircraft Delay and Airport Capacity Thresholds, 74 p. (2014)  |
| 105 | 02-31      | Guidelines for Ensuring Longevity in Airport Sound Insulation Programs, 56 p. (2014)   |
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| 150              | 09-12     | NextGen for Airports, Vol. 4: Leveraging NextGen Spatial Data for Airports: Guidebook, 104 p. (2016)                          |
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| 183 | 02-66     | User Guides for Noise Modeling of Commercial Space Operations--RUMBLE and PCBoom (& WOD 33), 190 p. (2018)  |
| 184 | 03-38     | Executive Summary for the Guidebook on Understanding FAA Grant Assurance Obligations (& WOD 44 Vol. 1; & WOD 44 Vol. 2; & WOD 44 Vol. 3; & WOD 44 Vol. 4), 36 p. (2018) |
| 185 | 02-67     | Airport Air Quality Management 101 (& WR 4), 66 p. (2018)   |
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### Research Results Digests

| No. | Proj. No.  | Title, Pages, Publication Year   |
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| 1   | 11-03      | Synthesis of Information Related to Airport Practices, 4 p. (2007)                     |
| 2   | 11-02/Task | 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. (2008)                     |
| 4   | 11-03      | Synthesis of Information Related to Airport Practices, 4 p. (2009)                     |
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| 8   | 11-03      | Synthesis of Information Related to Airport Practices, 4 p. (2010)                     |

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| 9   | 02-01        | Alternative Aircraft and Pavement Deicers and Anti-Icing Formulations with Improved Environmental Characteristics, 12 p. (2010) |
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| 11  | 11-02/Task   | Helping Airports Understand Payment Card Industry Data Security Standard (PCI DSS), 30 p. (2010)                                |
| 12  | 11-03        | Synthesis of Information Related to Airport Practices, 6 p. (2011)  |
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| 14  | 11-04        | Graduate Research Award Program on Public-Sector Aviation Issues, 20 p. (2012)  |
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| 17  | 11-03        | Synthesis of Information Related to Airport Practices, 8 p. (2013)  |
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| 25  | 11-04        | Graduate Research Award Program on Public-Sector Aviation Issues Update: 2008–2017, 28 p. (2017)                                |
| 26  | 11-03        | Synthesis of Information Related to Airport Practices, 12 p. (2017)   |
| 27  | 11-01        | Legal Aspects of Airport Programs—An Update, 24 p. (2017)   |
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### Legal Research Digests (Project 11-01)

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| 1   | 01-03     | Compilation of Airport Law Resources, 38 p. (2008)   |
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| 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), 0 p. (2008) |
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| 12  | 03-01     | Fair Disclosure and Airport Impact Statements in Real Estate Transfers, 70 p. (2011)                                       |
| 13  | 03-06     | An Index and Digest of Decisions: Compilation of Airport Law Resources (CD 108) (2012)                                     |
| 14  | 02-05     | Achieving Airport-Compatible Land Uses and Minimizing Hazardous Obstructions in Navigable Airspace, 74 p. (2012)           |
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| 21  | 04-05     | Compilation of DOT and FAA Airport Legal Determinations and Opinion Letters Through December 2012 (CD 141) (2013)   |
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| 3   | S04-01    | General Aviation Safety and Security Practices, 44 p. (2007)  |
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| 7   | S03-03    | Airport Economic Impact Methods and Models, 76 p. (2008)  |
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| 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)     |

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| 16  | S02-03    | Compilation of Noise Programs in Areas Outside DNL 65, 112 p. (2009)   |
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| 18  | S06-01    | Aviation Workforce Development Practices, 44 p. (2010)   |
| 19  | S01-02    | Airport Revenue Diversification, 64 p. (2010)  |
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| 23  | S04-05    | Bird Harassment, Repellent, and Deterrent Techniques for Use on and Near Airports, 40 p. (2011)  |
| 24  | S02-05    | Strategies and Financing Opportunities for Airport Environmental Programs, 228 p. (2011)   |
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| 29  | S10-05    | Ramp Safety Practices, 68 p. (2011)  |
| 30  | S01-03    | Airport Insurance Coverage and Risk Management Practices, 60 p. (2011)   |
| 31  | S01-04    | Airline and Airline-Airport Consortium to Manage Terminals and Equipment, 102 p. (2011)  |
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| 57  | S10-12    | Airport Response to Special Events, 148 p. (2014)  |
| 58  | S04-10    | Safety Reporting Systems at Airports, 65 p. (2014)   |
| 59  | S03-07    | Integrating Airport Geographic Information System (GIS) Data with Public Agency GIS, 74 p. (2014)  |
| 60  | S04-12    | Airport Emergency Post-Event Recovery Practices, 86 p. (2015)  |
| 61  | S03-10    | Practices in Preserving and Developing Public-Use Seaplane Bases, 96 p. (2015)   |
| 62  | S03-09    | Cell Phone Lots at Airports, 72 p. (2015)  |

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### Syntheses (Project 11-03)

| No. | Topic No. | Title, Pages, Publication Year  |
|-----|-----------|---|
| 63  | S10-13    | Overview of Airport Fueling System Operations, 118 p. (2015)  |
| 64  | S04-10    | Issues Related to Accommodating Animals Traveling Through Airports, 86 p. (2015)  |
| 65  | S10-14    | Practices to Develop Effective Stakeholder Relationships at Smaller Airports, 70 p. (2015)                              |
| 66  | S02-11    | Lessons Learned from Airport Sustainability Plans, 98 p. (2015)   |
| 67  | S09-06    | Airside Snow Removal Practices for Small Airports with Limited Budgets, 110 p. (2015)                                   |
| 68  | S01-10    | Strategies for Maintaining Air Service, 60 p. (2015)  |
| 69  | S02-12    | Airport Sustainability Practices—Drivers and Outcomes for Small Commercial and General Aviation Airports, 116 p. (2016) |
| 70  | S09-07    | Building Information Modeling for Airports, 96 p. (2016)  |
| 71  | S04-14    | Airport Safety Risk Management Panel Activities and Outcomes, 128 p. (2016)   |
| 72  | S04-17    | Table Top and Full-Scale Emergency Exercises for General Aviation, Non-Hub, and Small Hub Airports, 164 p. (2016)       |
| 73  | S04-16    | Emergency Communications Planning for Airports, 100 p. (2016)   |
| 74  | S04-13    | Combining Mixed-Use Flight Operations Safely at Airports, 172 p. (2016)   |
| 75  | S04-15    | Airport Advisories at Non-Towered Airports, 68 p. (2016)  |
| 76  | S02-13    | Helicopter Noise Information for Airports and Communities, 144 p. (2016)  |
| 77  | S02-14    | Airport Sustainability Practices, 52 p. (2016)  |
| 78  | S01-11    | Continuity of Operations Planning for Small Airports, 236 p. (2016)   |
| 79  | S01-14    | Funding Industrial Aviation, 52 p. (2017)   |
| 80  | S03-13    | Estimating Truck Trip Generation for Airport Air Cargo Activity, 56 p. (2017)   |
| 81  | S01-13    | Food and Beverages and Retail Operators: The Costs of Doing Business at Airports, 152 p. (2017)                         |
| 82  | S04-18    | Uses of Social Media to Inform Operational Response and Recovery During an Airport Emergency, 102 p. (2017)             |
| 83  | S03-12    | Preparing Airports for Communicable Diseases on Arriving Flights, 102 p. (2017)   |
| 84  | S03-11    | Transportation Network Companies: Challenges and Opportunities for Airport Operators, 70 p. (2017)                      |
| 85  | S02-15    | Alternative Fuels in Airport Fleets, 52 p. (2017)   |
| 86  | S01-15    | Airport Operator Options for Delivery of FBO Services, 100 p. (2018)  |
| 87  | S01-12    | Airport Participation in Oil and Gas Development, 90 p. (2018)  |
| 88  | S02-16    | Airport Community, Water Quality Events, and the Aircraft Drinking Water Rule, 56 p. (2018)                             |
| 89  | S02-19    | Clean Vehicles, Fuels, and Practices for Airport Private Ground Transportation Providers, 64 p. (2018)                  |
| 90  | S04-19    | Incorporating ADA and Functional Needs in Emergency Exercises, 38 p. (2018)   |
| 91  | S01-16    | Microgrids and Their Application for Airports and Public Transit (Joint: TCRP Syn. 137), 66 p. (2018)                   |
| 92  | S02-18    | Airport Waste Management and Recycling Practices, 52 p. (2018)  |
| 93  | S02-17    | Sustainability's Role in Enhancing Airport Capacity, 74 p. (2018)   |
| 94  | S01-17    | Attracting Investment at General Aviation Airports Through Public–Private Partnerships, 72 p. (2019)                    |
| 95  | S04-20    | Airport Incident Reporting Practices, 112 p. (2019)   |
| 96  | S09-08    | Practices to Mitigate Alkali-Silica Reaction (ASR) Affected Pavements at Airports, 90 p. (2019)                         |
| 97  | S03-15    | How Airports Plan for Changing Airport Capacity: The Effects of Upgrading, 100 p. (2019)                                |
| 98  | S03-14    | Simulation Options for Airport Planning, 80 p. (2019)   |
| 99  | S04-23    | Emergency Working Groups at Airports, 86 p. (2019)  |
| 100 | S02-20    | Airport Greenhouse Gas Reduction Efforts, 118 p. (2019)   |
| 101 | S07-02    | Communication Strategies for Airport Passenger Access and Mobility, 84 p. (2019)  |
| 102 | S01-18    | Value, Benefits, and Limitations of Qualifications-Based Selection for Airport Project Delivery, 108 p. (2019)          |
| 103 | S06-05    | Promoting Aviation Career Education in High Schools and Community Colleges, 166 p. (2019) Current                       |
| 104 | S10-15    | <b>Current Landscape of Unmanned Aircraft Systems</b> at Airports, 118 p. (2019)  |
| 105 | S04-22    | Airport Surface Weather Observations Options for General Aviation Airport, 104 p. (2019)                                |

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| 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           | 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           | Enhanced Modeling of Aircraft Taxiway Noise, Vol. 1: Scoping, 153 p. (2009)   |
| 9                  | 02-27                | Enhanced Modeling of Aircraft Taxiway Noise, Vol. 2: Aircraft Taxi Noise Database and Development Process, 138 p. (2013)  |
| 10                 | 10-07                | Appendix A: Documentation for ACRP Report 41 (& 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           | Risk Assessment of Proposed ARFF Standards, 105 p. (2011)   |
| 13                 | 02-23                | Alternative Fuels as a Means to Reduce PM2.5 Emissions at Airports, 175 p. (2012)   |
| 14                 | 03-12                | Guidelines for Preparing Peak Period and Operational Profiles (& CD 126; & Rep. 82), 316 p. (2013)  |
| 15                 | 03-25                | Data Supporting the Impact of Regulatory Compliance on Small Airports, Vol. 1: Appendixes A, B, & C (& Rep. 90), 121 p. (2013)  |
| 15                 | 03-25                | Data Supporting the Impact of Regulatory Compliance on Small Airports, Vol. 2: Technical Appendixes (& Rep. 90), 151 p. (2013)  |
| 16                 | 02-26                | Assessing Aircraft Noise Conditions Affecting Student Learning, Vol. 1: Final Report, 71 p. (2014)  |
| 16                 | 02-26                | Assessing Aircraft Noise Conditions Affecting Student Learning, Vol. 2: Appendices, 143 p. (2014)   |
| 17                 | 02-35                | Research Methods for Understanding Aircraft Noise Annoyance and Sleep Disturbance, 174 p. (2014)  |
| 18                 | 01-19                | Airport Capital Improvements: Developing a Cost-Estimating Model and Database (& CD 158; & Rep. 120), 45 p. (2014)  |
| 19                 | 02-37                | Integrated Noise Model Accuracy for General Aviation Aircraft, 92 p. (2014)   |
| 20                 | 03-16                | Guidebook for Estimating the Economic Impact of Air Cargo Operations at Airports, 360 p. (2014)   |
| 21                 | 02-34                | Quantifying Aircraft Lead Emissions at Airports (& Rep. 133), 218 p. (2015)   |
| 22                 | 03-19                | Passenger Value of Time, Benefit-Cost Analysis, and Airport Capital Investment Decisions, Vol. 1: Guidebook for Valuing User Time Savings in Airport Capital Investment Decision Analysis, 50 p. (2015) |
| 22                 | 03-19                | Passenger Value of Time, Benefit-Cost Analysis, and Airport Capital Investment Decisions, Vol. 2: Final Report, 113 p. (2015)   |
| 22                 | 03-19                | Passenger Value of Time, Benefit-Cost Analysis, and Airport Capital Investment Decisions, Vol. 3: Appendix A: Background Research and Appendix B: Stated Preference Survey, 345 p. (2015)               |
| 23                 | 09-05                | Guidance on Successful Computer Maintenance Management Systems (CMMS) Selection and Practices, 166 p. (2015)  |
| 24                 | 03-24                | Air Cargo Facility Planning and Development—Contractor's Final Report (& Rep. 143), 395 p. (2015)   |
| 25                 | 10-16                | Commercial Ground Transportation at Airports: Best Practices, Appendixes C through H (& Rep. 146), 822 p. (2015)  |
| 26                 | 02-45                | Methodology to Improve EDMS/AEDT Quantification of Aircraft Taxi/Idle Emissions, 97 p. (2016)   |
| 27                 | 09-10                | Methodology to Develop the Airport Terminal Building Energy Use Intensity (ATB-EUI) Benchmarking Tool (& CD 178), 34 p. (2016)  |
| 28                 | 06-04                | Identifying and Evaluating Airport Workforce Requirements—Phase 1 Report, 182 p. (2016)   |
| 29                 | 11-01/Topic<br>07-01 | Compendium of State and Federal Laws Affecting the Possession of Firearms at Airports (& LRD 29), 727 p. (2016)   |
| 30                 | 02-43                | Development of a NOx Chemistry Module for EDMS/AEDT to Predict NO2 Concentrations, 330 p. (2017)  |
| 31                 | 10-22                | Improving Stakeholder Engagement in Aircraft Accident Response Planning, 66 p. (2017)   |
| 32                 | 02-52                | Improving AEDT Noise Modeling of Mixed Ground Surfaces, 154 p. (2017)   |

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| Web-Only Documents |              |  |
|--------------------|--------------|--|
| No.                | Proj. No.    | Title, Pages, Publication Year   |
| 33                 | 02-66        | Commercial Space Operations Noise and Sonic Boom Modeling and Analysis (& Rep. 183), 91 p. (2018)                              |
| 34                 | 02-47        | Assessing Aircraft Noise Conditions Affecting Student Learning—Case Studies, 257 p. (2017)                                     |
| 35                 | 02-80        | State of the Industry Report on Air Quality Emissions from Sustainable Alternative Jet Fuels, 41 p. (2018)                     |
| 36                 | 02-55        | Enhanced AEDT Modeling of Aircraft Arrival and Departure Profiles, Vol. 1: Guidance Document, 47 p. (2018)                     |
| 36                 | 02-55        | Enhanced AEDT Modeling of Aircraft Arrival and Departure Profiles, Vol. 2: Research Report, 74 p. (2018)                       |
| 37                 | 11-02/Task   | Research Roadmap in the Area of Airport Operations and Maintenance, 34 p. (2019)   |
| 38                 | 03-40        | Technical Appendix to Air Demand in a Dynamic Competitive Context with the Automobile (& Rep. 204), 91 p. (2019)               |
| 39                 | 11-02/Task   | Policy <b>and</b> Planning Issues Roadmap Report, 42 p. (2019)   |
| 40                 | 11-02/Task   | Airport Design and Construction Narrative Research Roadmap, 34 p. (2019)   |
| 41                 | 02-80        | Alternative Jet Fuels Emissions: Quantification Methods Creation and Validation Report, 122 p. (2019)                          |
| <b>43</b>          | <b>02-79</b> | <b>Improving AEDT Modeling for Aircraft Noise Reflection and Diffraction from Terrain and Manmade Structures 122 p. (2019)</b> |
| 44                 | 03-38        | Understanding FAA Grant Assurance Obligations, Vol. 1: Guidebook (& Rep. 184), 275 p. (2018)                                   |
| 44                 | 03-38        | Understanding FAA Grant Assurance Obligations, Vol. 2: Technical Appendices (& Rep. 184), 185 p. (2018)                        |
| 44                 | 03-38        | Understanding FAA Grant Assurance Obligations, Vol. 3: Research Report (& Rep. 184), 43 p. (2018)                              |
| 44                 | 03-38        | Understanding FAA Grant Assurance Obligations, Vol. 4: Summary of AIP Grant Assurance Requirements (& Rep. 184), 207 p. (2018) |

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| CDs |                      |  |
|-----|----------------------|--|
| No. | Proj. No.            | Title, Publication Year  |
| 68  | 11-01/Topic<br>01-01 | 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                | Appendices 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)  |
| 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)   |
| 108 | 11-01/Topic<br>03-06 | An Index and Digest of Decisions: Compilation of Airport Law Resources (LRD 13) (2012)                               |
| 109 | 01-14                | Appendices for ACRP Report 66 (& Rep. 66) (2012)   |

| CDs |                      |   |
|-----|----------------------|---|
| No. | Proj. No.            | Title, Publication Year   |
| 110 | 03-14                | Resource CD for ACRP Report 67 (& Rep. 67) (2012)   |
| 112 | 07-07                | Analysis Templates for ACRP Report 68 (& Rep. 68) (2012)  |
| 113 | 02-25                | Tools for Evaluating Emissions and Costs of APUs and Alternative Systems (TEECAS) for ACRP Report 64 (& Rep. 64) (2012) |
| 114 | 10-08                | Applying Intelligent Transportation Systems to Improve Airport Traveler Access Information (& Rep. 70) (2012)           |
| 115 | 02-08                | Appendices to ACRP Report 71 (& Rep. 71) (2012)   |
| 117 | 01-18                | Airport ERM Tool for ACRP Report 74 (& Rep. 74) (2012)  |
| 119 | 01-17                | Digital Files for ACRP Report 77: Guidebook for Developing General Aviation Airport Business Plans (& Rep. 77) (2012)   |
| 123 | 02-16                | Airport Ground Support Equipment: Tutorial and Database (& Rep. 78) (2012)  |
| 124 | 03-17                | Supplemental Material to ACRP Report 79: Prototype Airfield Capacity Spreadsheet Model (& Rep. 79) (2012)               |
| 125 | 02-22                | Evaluation Tool to Supplement ACRP Report 80 (& Rep. 80) (2012)   |
| 126 | 03-12                | Guidebook and Toolboxes for ACRP Report 82 (& Rep. 82; & WOD 14) (2013)   |
| 129 | 02-36                | Toolkit for Evaluating Alternative Fuel Distribution Programs and Appendixes to ACRP Report 83 (& Rep. 83) (2013)       |
| 131 | 02-21                | Airport Emissions Estimator Tool and Other Support Material for ACRP Report 84 (& Rep. 84) (2013)                       |
| 133 | 06-02                | Supplemental Materials for ACRP Report 75: Airport Leadership Development Program (& Rep. 75) (2013)                    |
| 136 | 02-12                | Departure Optimization Investigation Tool (DOIT) (& Rep. 86) (2013)   |
| 137 | 02-20                | The Vector-Borne Disease Airport Importation Risk Tool (2013)   |
| 139 | 04-11                | Tool Set for Integrating GIS in Emergency Management at Airports (& Rep. 88) (2013)                                     |
| 140 | 03-18                | Airport Business Continuity Planning Software Tool (& Rep. 93) (2013)   |
| 141 | 11-01/Topic<br>04-05 | Compilation of DOT and FAA Airport Legal Determinations and Opinion Letters Through December 2012 (LRD 21) (2013)       |
| 142 | 02-33                | Airport Construction Emissions Inventory Tool (ACEIT) (& Rep. 102) (2014)   |
| 144 | 10-14                | IROPS Investment Support Tool (IRIS) (& Rep. 106) (2014)  |
| 145 | 04-14                | Lateral Runway Safety Area Risk Analysis (LRSARA) Tool (& Rep. 107) (2014)  |
| 149 | 09-06                | Evaluation Process and Cost-Benefit Tool (& Rep. 110) (2014)  |
| 150 | 09-02                | Supplemental Materials for ACRP Report 101 (& Rep. 101) (2014)  |
| 151 | 04-15                | Airport Terminal Incident Response Plan (TIRP) Tool (& Rep. 112) (2014)   |
| 156 | 07-11                | Supplemental Material to ACRP Report 117 (& Rep. 117) (2014)  |
| 157 | 03-23                | Air/Rail Diversion Model (& Rep. 118) (2015)  |
| 158 | 01-19                | ACCE: Airport Capital Cost Estimation Tool (& Rep. 120; & WOD 18) (2014)  |
| 159 | 09-08                | Bird Strike Risk Analysis and Stormwater Management Decision Tool (& Rep. 125) (2015)                                   |
| 160 | 11-02/Task           | Airport Toolbox for ACRP Report 122 (& Rep. 122) (2014)   |
| 161 | 02-41                | Estimating Takeoff Thrust Settings for Airport Emissions Inventories (2015)   |
| 164 | 07-12                | Appendices for the Guidebook for Airport Terminal Restroom Planning and Design (& Rep. 130) (2015)                      |
| 167 | 02-34                | Emissions Inventory Analysis Tool (& Rep. 133) (2015)   |
| 168 | 10-17                | Integrated Self-Service Tools for ACRP Report 136 (& Rep. 136) (2015)   |
| 169 | 09-04                | Spreadsheet Tool and Appendices to ACRP Report 139 (& Rep. 139) (2015)  |
| 170 | 10-18                | Checklists and PowerPoint Template for ACRP Report 138 (& Rep. 138 Vol. 2) (2015)                                       |
| 171 | 05-02                | Multimedia Materials Supporting the Guidebook on Best Practices for Airport Cybersecurity (& Rep. 140) (2015)           |
| 173 | 04-17                | WHaMRAT Tool, User Guide, and Quick-Start Guides (& Rep. 145) (2015)  |
| 174 | 03-24                | Air Cargo Facility Planning Model (& Rep. 143) (2015)   |
| 175 | 02-40                | ACROS Tool and Other Resources to Accompany ACRP Report 147 (& Rep. 147) (2015)   |
| 177 | 02-56                | Supplemental Information for ACRP Report 151 (& Rep. 151) (2016)  |
| 178 | 09-10                | Airport Terminal Building Energy Use Intensity (ATB-EUI) Benchmarking Tool (& WOD 27) (2016)                            |
| 180 | 10-23                | IROPS Tools for Planning, Communication & Coordination (& Rep. 153) (2016)  |

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| CDs |           |   |
|-----|-----------|---|
| No. | Proj. No. | Title, Publication Year                                   |
| 181 | 02-59     | End Use Water Audit Tool (& Rep. 154) (2016)              |
| 182 | 10-21     | Regulation Compliance Management Tool (& Rep. 156) (2016) |

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| WebResources |           |   |
|--------------|-----------|---|
| No.          | Proj. No. | Title, Pages, Publication Year  |
| 1            | 03-31     | Aligning Community Expectations with Airport Roles (2017)                                     |
| 2            | 07-15     | Airport Passenger Terminal Design Library (2017)  |
| 3            | 02-61     | Airport Stormwater Electronic Resource Library and Training Materials (2017)                  |
| 3            | 02-71     | Airport Stormwater Electronic Resource Library and Training Materials: Update (In Production) |
| 4            | 02-67     | Airport Air Quality Resource Library (& Rep. 185) (2018)                                      |
| 5            | 01-27     | Tools and Case Studies for NextGen for Airports (2018)  |
| 6            | 01-32     | Resources for Managing Small Airports (& Rep. 16 Second Edition) (2018)                       |
| 7            | 09-16     | Best Practices for Airport Obstruction Management Library (& Rep. 195) (2019)                 |

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| Conference Proceedingss |              |   |
|-------------------------|--------------|---|
| 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   | Research on the Transmission of Disease in Airports and on Aircraft, 70 p. (2010)   |
| 55                      | 11-08(16-03) | Airport Roles in Reducing Transmission of Communicable Diseases: Proceedings of a Workshop of the Airport Cooperative Research Program's 2018 Insight Event, 31 p. (2019) |

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| Conference Proceedings on the Web |              |  |
|-----------------------------------|--------------|--|
| No.                               | Proj. No.    | Title, Pages, Publication Year   |
| 23                                | 11-08(16-02) | Social/Economic Sustainability at Airports: Proceedings of a Workshop of the Airport Cooperative Research Program's 2018 Insight Event, 21 p. (2019) |
| 24                                | 11-08        | Challenges to Implementing Successful Land Use Strategies at Airports: Proceedings of a Workshop, 31 p. (2019)                                       |

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## Notes:

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

Publications in parentheses without an ampersand are reports or digests published as stand-alone CDs.

## Appendix B: Summary of Project Status Through December 31, 2019

| No.                       | Title   | Allocation                                    | Contract Amount | Contractor                      | Start Date | End Date   | Status   | FAA Liaison(s) | Staff Officer |
|---------------------------|---|---|-----------------|---------------------------------|------------|------------|--|----------------|---------------|
| <b>01: Administration</b> |   |   |                 |                                 |            |            |  |                |               |
| 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)<br>\$25,000(08)<br>\$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       | Ricundo & 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                            | 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                         |                |               |

| 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)<br>\$100,000(10) | \$549,727       | Amadeus Consulting                   | 9/30/2010  | 7/31/2016  | Completed  |                |               |
| 01-14 | Considering and Evaluating Airport Privatization   | \$500,000(09A)                  | \$500,000       | Leigh Fisher                         | 5/10/2010  | 12/31/2011 | Completed - Published as Report 66                           |                |               |
| 01-15 | Innovative Revenue Strategies - An Airport Guide   | \$400,000(10)                   | \$400,000       | KRAMER aerotek, Inc.                 | 5/14/2010  | 12/31/2014 | Completed - Published as Report 121                          |                |               |
| 01-16 | Asset and Infrastructure Management for Airports   | \$400,000(10)                   | \$400,000       | GHD Consulting                       | 6/16/2010  | 12/1/2011  | Completed - Published as Report 69                           |                |               |
| 01-17 | Guidebook for Developing General Aviation Airport Business Plans                                     | \$400,000(10)                   | \$398,350       | Aviation Management Consulting Group | 6/28/2010  | 6/1/2012   | Completed - Published as Report 77                           |                |               |
| 01-18 | Application of Enterprise Risk Management at Airports  | \$350,000(10)                   | \$350,000       | Marsh, USA                           | 6/30/2010  | 3/30/2012  | Completed - Published as Report 74                           |                |               |
| 01-19 | Airport Capital Improvements: A Business Planning and Decision-Making Approach                       | \$400,000(11)                   | \$400,000       | MCR Federal, LLC                     | 7/13/2011  | 7/31/2014  | Completed - Published as Report 120 and Web-Only Document 18 |                |               |
| 01-20 | Procuring and Managing Professional Services for Airports  | \$350,000(11)                   | \$350,000       | HNTB                                 | 6/15/2011  | 1/20/2013  | Completed - Published as Report 87                           |                |               |
| 01-21 | A Guidebook for Airport-Airline Consortiums  | \$400,000(12)                   | \$387,642       | AVAirPros                            | 6/1/2012   | 4/1/2014   | Completed - Published as Report 111                          |                |               |
| 01-22 | Guidebook for Successfully Assessing and Managing Risks for Airport Capital and Maintenance Projects | \$300,000(12)                   | \$300,000       | Direct Effect Solutions, Inc.        | 8/14/2012  | 5/14/2014  | Completed - Published as Report 116                          |                |               |

| No.   | Title   | Allocation    | Contract Amount | Contractor                         | Start Date | End Date   | Status  | FAA Liaison(s)           | Staff Officer |
|-------|---|---------------|-----------------|------------------------------------|------------|------------|---|--------------------------|---------------|
| 01-23 | A Guidebook for Mitigating Disruptive WiFi Interference at Airports                                   | \$350,000(13) | \$349,489       | System Planning Corp.              | 5/2/2013   | 8/1/2014   | Completed - Published as Report 127           |                          |               |
| 01-24 | Renewable Energy as an Airport Revenue Source   | \$400,000(13) | \$399,612       | Harris Miller Miller & Hanson      | 8/13/2013  | 3/31/2015  | Completed - Published as Report 141           |                          |               |
| 01-25 | A Guidebook for Increasing Diverse and Small Business Participation in Airport Business Opportunities | \$250,000(13) | \$250,000       | Exstare Federal Services, LLC      | 8/13/2013  | 9/6/2014   | Completed - Published as Report 126           |                          |               |
| 01-26 | Improving the Airport Customer Experience   | \$400,000(14) | \$400,000       | Leigh Fisher                       | 7/11/2014  | 2/15/2016  | Completed - Published as Report 157           |                          |               |
| 01-27 | NextGen - A Primer  | \$750,000(14) | \$750,000       | Logistics Management Institute     | 6/16/2014  | 1/31/2017  | Completed - Published as WebResource 5        |                          |               |
| 01-28 | NextGen - Guidance for Engaging Airport Stakeholders  | \$300,000(14) | \$300,000       | Grafton Technologies, Inc.         | 6/4/2014   | 5/6/2016   | Completed - Published as Report 150, Volume 2 |                          |               |
| 01-29 | Design and Development of a State Aviation Information Database                                       | \$150,000(16) | \$149,975       | iEngineering Corporation           | 8/31/2016  | 3/29/2019  | Completed - Database provided to NASAO        |                          |               |
| 01-30 | Airport Management Guide for Providing Aircraft Fuel Services   | \$350,000(16) | \$350,000       | KRAMER aerotek, Inc.               | 10/1/2016  | 6/30/2018  | Completed - Published as Research Report 192  |                          |               |
| 01-31 | Innovative Solutions to Facilitate Accessibility for Airport Travelers with Disabilities              | \$350,000(16) | \$349,973       | Open Doors Organization            | 6/16/2016  | 4/15/2019  | Completed - Publication Pending               | R. Bornhorst<br>L. Miler | T. Schatz     |
| 01-32 | Updating ACRP Report 16: Guidebook for Managing Small Airports  | \$350,000(16) | \$349,948       | Hanson Professional Services, Inc. | 8/18/2016  | 4/30/2018  | Completed - Published as WebResource 6        |                          |               |
| 01-33 | Preparing for the Connected Airport and the Internet of Things  | \$400,000(16) | \$400,000       | Texas A&M Transportation Institute | 6/22/2016  | 3/30/2018  | Completed - Published as Research Report 191  |                          |               |
| 01-34 | Developing Innovative Strategies for Aviation Education and Participation                             | \$400,000(16) | \$350,000       | Mead & Hunt Inc.                   | 9/21/2016  | 12/31/2018 | Completed - Published as Research Report 202  | J. Navarrete             |               |

| No.   | Title  | Allocation     | Contract Amount | Contractor                          | Start Date | End Date   | Status                          | FAA Liaison(s)                         | Staff Officer  |
|-------|--|----------------|-----------------|-------------------------------------|------------|------------|---------------------------------|--|----------------|
| 01-35 | Transportation Network Companies (TNC's): Impacts To Airport Revenues and Operations | \$500,000(18)  | \$498,512       | Ricundo & Associates                | 2/14/2017  | 9/30/2019  | Completed - Publication Pending | K. Brockman<br>R. Clark                | T. Schatz      |
| 01-36 | Guidebook for Developing State Aviation System Plans                                 | \$300,000(18)  | \$299,999       | Kimley-Horn & Associates            | 4/29/2019  | 10/31/2020 | Research in Progress            | C. Nutting<br>J. Raymond<br>A. Velayos | J. Navarrete   |
| 01-37 | Performance Measures for State Aviation Agencies                                     | \$250,000(18)  | \$250,000       | Mead & Hunt Inc.                    | 6/18/2018  | 3/20/2020  | Research in Progress            | K. Erhard<br>C. Fields<br>B. Gearhart  | M. Greenberger |
| 01-38 | Market Characteristics for Property at Small Airports                                | \$200,000(18)  | \$200,000       | Aviation Management Consulting Inc. | 5/9/2018   | 6/8/2019   | Completed - Publication Pending | R. Eitter<br>G. Loftus<br>A. Walter    | M. Greenberger |
| 01-39 | Creating Marketing Techniques to Improve Revenue Generation Partnerships             | \$300,000(19)  |                 | Global Dynamics Group               | 10/6/2019  | 10/5/2020  | Research in Progress            | D.Duchow                               | J. Navarrete   |
| 01-40 | Evaluating the Traveler's Perspective to Improve the Airport Customer Experience     | \$500,000 (19) | \$500,000       | iOS Partners, Inc.                  | 5/1/2019   | 9/30/2020  | Research in Progress            | J. Raymond                             | T. Schatz      |
| 01-41 | Blockchain Technology and Airports - A Primer  | \$330,000 (19) | \$0             |                                     |            |            | In Development                  |  | T. Schatz      |
| 01-42 | Review of Airport Governance Structures  | \$300,000 (19) | \$300,000       | Crawford, Murphy & Tilly, Inc.      | 4/24/2019  | 7/23/2020  | Research in Progress            | M. Vasconcelos                         | M. Greenberger |
| 01-43 | Conducting Consumer Research of Air Passengers                                       | \$450,000 (19) | \$450,000       | JD Frantz Research, Inc.            | 6/10/2019  | 12/9/2020  | Research in Progress            | W. Reinhardt                           | J. Navarrete   |
| 01-44 | Airport Insurance Requirements   | \$300,000 (20) | \$0             |                                     |            |            | In Development                  |  | M. Greenberger |
| 01-45 | Updated Guidebook for Airport Project Delivery Systems                               | \$450,000 (20) | \$0             |                                     |            |            | In Development                  |  | M. Greenberger |

| No.                    | Title   | Allocation     | Contract Amount | Contractor                           | Start Date | End Date   | Status  | FAA Liaison(s) | Staff Officer |
|------------------------|---|----------------|-----------------|--------------------------------------|------------|------------|---|----------------|---------------|
| 01-46                  | Geospatial Data Governance—Organization Factors and Best Practices for Airports                                   | \$450,000 (20) | \$0             |                                      |            |            | In Development  |                |               |
| 01-47                  | Guide to Airport Innovation—Creating an Organizational Fit for the Future   | \$300,000 (20) | \$0             |                                      |            |            | In Development  |                | T. Schatz     |
| 01-48                  | Assessing the Effectiveness of Airport Services and Programs for Passengers with Disabilities                     | \$500,000 (20) | \$0             |                                      |            |            | In Development  |                |               |
| <b>02: Environment</b> |   |                |                 |                                      |            |            |   |                |               |
| 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  | 3/30/2012  | Completed - Published as Report 63  |                |               |
| 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   |                |               |

| No.    | Title   | Allocation                    | Contract Amount       | Contractor                   | Start Date | End Date   | Status   | FAA Liaison(s) | Staff Officer |
|--------|---|-------------------------------|-----------------------|------------------------------|------------|------------|--|----------------|---------------|
| 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, Inc.      | 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             | CSSL, Inc.                   | 10/22/2007 | 10/29/2010 | Completed - Published as Report 46                         |                |               |
| 02-08  | Quantifying Contributions to Local Air Quality Impacts from Airport-Related Emissions           | \$600,000(08)                 | \$599,970             | Wyle Laboratories, Inc.      | 6/4/2008   | 4/30/2012  | Completed - Published as Report 71                         |                |               |
| 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  | Handbook for Considering Practical Greenhouse Gas Emission Reduction Strategies for Airports    | \$500,000(09)                 | \$499,921             | CDM                          | 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  | 3/29/2013  | Completed - Published as Report 86                         |                |               |
| 02-13  | Guidebook of Practices for Improving Environmental Performance at Small Airports                | \$200,000(09)<br>\$75,000(08) | \$200,000<br>\$75,000 | Gresham, Smith and Partners  | 6/16/2009  | 8/20/2010  | Completed - Published as Report 43                         |                |               |

| No.    | Title  | Allocation    | Contract Amount   | Contractor | Start Date | End Date   | Status  | FAA Liaison(s) | Staff Officer |
|--------|--|---------------|---|------------|------------|------------|---|----------------|---------------|
| 02-14  | Guidebook for Selecting Methods to Monitor Airport and Aircraft Deicing Materials    | \$200,000(09) | \$150,000 Gresham, Smith and Partners                   |            | 6/3/2010   | 2/28/2012  | Completed - Published as Report 72            |                |               |
| 02-15  | Recycling Best Practices - A Guidebook for Advancing Recycling from Aircraft Cabins  | \$300,000(09) | \$300,000 Cascadia Consulting Group                     |            | 9/22/2010  | 7/15/2013  | Completed - Published as Report 100           |                |               |
| 02-16  | Airport Ground Support Equipment (GSE) Inventory and Emission Reduction Strategies   | \$600,000(09) | \$599,717 CDM   |            | 6/18/2010  | 6/30/2012  | Completed - Published as Report 78            |                |               |
| 02-17  | Measuring PM Emissions from Aircraft Auxiliary Power Units, Tires and Brakes         | \$500,000(09) | \$500,000 Missouri University of Science and Technology |            | 9/3/2010   | 5/31/2013  | Completed - Published as Report 97            |                |               |
| 02-18  | Guidelines for Integrating Alternative Jet Fuel into the Airport Setting             | \$250,000(09) | \$249,982 Metron Aviation                               |            | 6/17/2010  | 10/16/2011 | Completed - Published as Report 60            |                |               |
| 02-19  | Winter Design Storm Factor Determination for Airports                                | \$300,000(09) | \$249,999 CH2M Hill                                     |            | 6/24/2010  | 12/11/2012 | Completed - Published as Report 81            |                |               |
| 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   | 9/30/2013  | Completed - Published as CRP-CD-137           |                |               |
| 02-20A | Infectious Disease Mitigation in Airports and on Aircraft                            | \$200,000(11) | \$200,000 Environmental Health & Engineering            |            | 7/6/2011   | 5/31/2013  | Completed - Published as Report 91            |                |               |
| 02-21  | Guidebook for Preparing Airport Emissions Inventories for State Implementation Plans | \$500,000(10) | \$499,805 KB Environmental Sciences                     |            | 8/3/2010   | 2/28/2013  | Completed - Published as Report 84            |                |               |
| 02-22  | Incorporating Sustainability into Traditional Airport Projects                       | \$300,000(09) | \$300,000 Landrum & Brown                               |            | 7/12/2010  | 5/31/2012  | Completed - Published as Report 80            |                |               |
| 02-23  | Alternative Fuels as a Means to Reduce PM2.5 Emissions at Airports                   | \$500,000(10) | \$499,798 Project Performance Corp.                     |            | 7/6/2010   | 4/30/2012  | Completed - Published as Web-Only Document 13 |                |               |

| No.    | Title   | Allocation    | Contract Amount | Contractor                       | Start Date | End Date   | Status   | FAA Liaison(s) | Staff Officer |
|--------|---|---------------|-----------------|----------------------------------|------------|------------|--|----------------|---------------|
| 02-24  | Guidelines for Airport Sound Insulation Programs  | \$200,000(10) | \$200,000       | Jones Payne Group                | 8/27/2010  | 3/8/2013   | Completed - Published as Report 89                     |                |               |
| 02-25  | Evaluating Alternatives for Aircraft Ground Power, Heating, and Air Conditioning                        | \$200,000(10) | \$199,773       | Environmental Science Associates | 7/7/2010   | 12/31/2011 | Completed - Published as Report 64                     |                |               |
| 02-26  | Assessing Aircraft Noise Conditions Affecting Student Learning  | \$450,000(10) | \$449,672       | Wyle Laboratories, Inc.          | 6/26/2010  | 11/30/2013 | Completed - Published as Web-Only Document 16          |                |               |
| 02-27  | Aircraft Taxi Noise Database for Airport Noise Modeling   | \$150,000(10) | \$149,779       | Wyle Laboratories, Inc.          | 6/11/2010  | 3/29/2013  | Completed - Published as Web-Only Document 9, Volume 1 |                |               |
| 02-27A | Developing a Generic Commercial Jet Taxi Noise Directivity Pattern for AEDT                             | \$75,000(12)  | \$74,767        | Wyle Laboratories, Inc.          | 2/22/2012  | 3/29/2013  | Completed - Published as Web-Only Document 9, Volume 2 |                |               |
| 02-28  | Prototype Airport Sustainability Rating System - Characteristics, Viability, and Implementation Options | \$800,000(11) | \$687,103       | Vanasse Hangen Brustlin, Inc.    | 6/27/2011  | 12/31/2014 | Completed - Published as Report 119                    |                |               |
| 02-29  | Guidance for Treatment of Airport Stormwater Containing Deicers   | \$600,000(11) | \$500,000       | Gresham, Smith and Partners      | 5/31/2011  | 9/30/2013  | Completed - Published as Report 99                     |                |               |
| 02-30  | Enhancing the Airport-Industry Database of Sustainable Practices  | \$500,000(11) | \$846,320       | CDM                              | 7/18/2011  | 9/29/2017  | Completed - Transferred to DFW Airport                 |                |               |
| 02-31  | Guidelines for Ensuring Longevity in Airport Sound Insulation Programs                                  | \$350,000(11) | \$349,980       | Wyle Laboratories, Inc.          | 7/8/2011   | 9/15/2013  | Completed - Published as Report 105                    |                |               |
| 02-32  | Understanding Microbial Biofilms in Receiving Waters Impacted by Airport Deicing Activities             | \$400,000(11) | \$300,000       | CH2M Hill                        | 7/20/2011  | 5/30/2014  | Completed - Published as Report 115                    |                |               |
| 02-33  | Guidance for Estimating Airport Construction Emissions  | \$350,000(11) | \$349,980       | Wyle Laboratories, Inc.          | 7/1/2011   | 9/30/2013  | Completed - Published as Report 102                    |                |               |

| No.   | Title   | Allocation    | Contract Amount                              | Contractor | Start Date | End Date   | Status  | FAA Liaison(s) | Staff Officer |
|-------|---|---------------|--|------------|------------|------------|---|----------------|---------------|
| 02-34 | Best Practices Guidebook for Preparing Lead (Pb) Emission Inventories from Piston-Powered Aircraft  | \$500,000(11) | \$500,000 Sierra Research, Inc.              |            | 6/3/2011   | 10/21/2014 | Completed - Published as Report 133; and Web-Only Document 21 |                |               |
| 02-35 | Research Methods for Understanding Aircraft Noise Annoyance and Sleep Disturbance                   | \$600,000(11) | \$599,993 Harris Miller Miller & Hanson Inc. |            | 9/20/2011  | 6/30/2014  | Completed - Published as Web-Only Document 17                 |                |               |
| 02-36 | Assessing Opportunities for Alternative Fuel Distribution Programs                                  | \$500,000(11) | \$400,000 Metron Aviation                    |            | 5/26/2011  | 12/6/2012  | Completed - Published as Report 83                            |                |               |
| 02-37 | Integrated Noise Model Accuracy for General Aviation Aircraft                                       | \$400,000(11) | \$350,000 Harris Miller Miller & Hanson Inc. |            | 6/13/2011  | 9/30/2014  | Completed - Published as Web-Only Document 19                 |                |               |
| 02-38 | Guidebook for Energy Facilities Compatibility with Airports and Airspace                            | \$450,000(12) | \$449,850 Harris Miller Miller & Hanson Inc. |            | 5/2/2012   | 11/2/2013  | Completed - Published as Report 108                           |                |               |
| 02-39 | Applying Whole Effluent Toxicity Testing to Aircraft Deicing Runoff                                 | \$500,000(12) | \$339,603 NewFields Government Services, LLC |            | 10/5/2012  | 1/30/2015  | Completed - Published as Report 134                           |                |               |
| 02-40 | Climate Change Adaptation Planning: Risk Assessment for Airports                                    | \$500,000(12) | \$491,923 Dewberry & Davis, LLC              |            | 11/20/2012 | 3/20/2015  | Completed - Published as Report 147                           |                |               |
| 02-41 | Estimating Takeoff Thrust Settings for Airport Emissions Inventories                                | \$450,000(12) | \$449,998 The Cadmus Group, LLC              |            | 9/1/2012   | 10/31/2014 | Completed - Published as CD-161                               |                |               |
| 02-42 | Understanding Air Quality and Public Health Studies Related to Airports                             | \$200,000(12) | \$199,675 Wyle Laboratories, Inc.            |            | 9/25/2012  | 2/28/2015  | Completed - Published as Report 135                           |                |               |
| 02-43 | Development of NOx Chemistry Module for EMDS/AEDT to Predict NO2 Concentrations                     | \$400,000(13) | \$399,577 KB Environmental Sciences          |            | 7/10/2013  | 1/31/2017  | Completed - Published as Web-Only Document 30                 |                |               |
| 02-44 | Recommended Community Noise Model Enhancements to Improve Prediction of Helicopter Activity Impacts | \$250,000(13) | \$249,811 Wyle Laboratories, Inc.            |            | 5/2/2013   | 9/30/2015  | Completed - Published as Research Results Digest 24           |                |               |

| No.   | Title  | Allocation                    | Contract Amount | Contractor                          | Start Date | End Date   | Status  | FAA Liaison(s) | Staff Officer |
|-------|--|-------------------------------|-----------------|-------------------------------------|------------|------------|---|----------------|---------------|
| 02-45 | Methodology to Improve EDMs/AEDT Quantification of Aircraft Taxi/die Emissions                     | \$250,000(13)                 | \$249,959       | KB Environmental Sciences           | 7/8/2013   | 1/29/2016  | Completed - Published as Web-Only Document 26 |                |               |
| 02-46 | Improving Ground Support Equipment (GSE) Operational Data for Airport Emissions Modeling           | \$275,000(13)                 | \$275,000       | KB Environmental Sciences           | 7/5/2013   | 12/15/2015 | Completed - Published as Report 149           |                |               |
| 02-47 | Assessing Aircraft Noise Conditions Affecting Student Achievement--Case Studies                    | \$600,000(14)<br>\$75,429(17) | \$599,939       | Harris Miller Miller & Hanson, Inc. | 5/22/2014  | 8/31/2017  | Completed - Published as Web-Only Document 34 |                |               |
| 02-48 | Assessing Community Annoyance of Helicopter Noise  | \$700,000(14)                 | \$699,778       | Landrum & Brown, Inc.               | 6/3/2014   | 6/30/2017  | Completed - Published as Research Report 181  |                |               |
| 02-49 | Addressing Significant Weather Impacts on Airports   | \$550,000(14)                 | \$550,000       | ICF Incorporated, LLC               | 5/22/2014  | 2/29/2016  | Completed - Published as Report 160           |                |               |
| 02-50 | Deriving Benefits from Alternative Aircraft-Taxi Systems   | \$300,000(14)                 | \$300,000       | The Cadmus Group, LLC               | 7/15/2014  | 4/30/2016  | Completed - Published as Report 158           |                |               |
| 02-51 | Evaluating Methods for Determining Interior Noise Levels Used in Airport Sound Insulation Programs | \$300,000(14)                 | \$299,678       | CSDA Design Group                   | 6/9/2014   | 10/30/2015 | Completed - Published as Report 152           |                |               |
| 02-52 | Improving AEDT Noise Modeling of Hard, Soft, and Mixed Ground Surfaces                             | \$250,000(14)                 | \$249,603       | Wyle Laboratories, Inc.             | 6/11/2014  | 4/28/2017  | Completed - Published as Web-Only Document 32 |                |               |
| 02-53 | Interpreting Airport Water Monitoring Results  | \$250,000(14)                 | \$250,000       | Gresham, Smith and Partners         | 8/8/2014   | 6/30/2016  | Completed - Published as Research Report 166  |                |               |
| 02-54 | Measuring and Understanding Emission Factors for General Aviation (GA) Aircraft                    | \$500,000(14)                 | \$499,971       | Aerodyne Research, Inc.             | 5/20/2014  | 6/30/2016  | Completed - Published as Research Report 164  |                |               |
| 02-55 | Enhanced AEDT Modeling of Aircraft Arrival and Departure Profiles                                  | \$350,000(14)                 | \$349,921       | ATAC Corporation                    | 6/9/2014   | 3/30/2018  | Completed - Published as Web doc 36           |                |               |

| No.   | Title   | Allocation                     | Contract Amount | Contractor                        | Start Date | End Date   | Status  | FAA Liaison(s) | Staff Officer |
|-------|---|--------------------------------|-----------------|-----------------------------------|------------|------------|---|----------------|---------------|
| 02-56 | Developing a Business Case for Renewable Energy at Airports   | \$300,000(14)                  | \$299,903       | Harris Miller & Hanson, Inc.      | 5/27/2014  | 10/26/2015 | Completed - Published as Report 151                         |                |               |
| 02-57 | Reducing the Impact of Lead Emissions at Airports   | \$200,000(14)                  | \$199,971       | Sierra Research, Inc.             | 7/28/2014  | 6/8/2016   | Completed - Published as Research Report 162                |                |               |
| 02-58 | Dispersion Modeling Guidance for Airports Addressing Local Area Quality Health Concerns             | \$400,000(14)                  | \$399,999       | University of North Carolina      | 6/10/2014  | 7/31/2017  | Completed - Published as Research Report 179                |                |               |
| 02-59 | Water Efficiency Management Strategies at Airports  | \$450,000(14)                  | \$449,999       | The Cadmus Group, LLC             | 6/4/2014   | 2/5/2016   | Completed - Published as Report 154                         |                |               |
| 02-60 | Use and Potential Impacts of AFFF Containing Per and Polyfluoroalkyl Substances (PFASs) at Airports | \$480,000(15)                  | \$299,995       | Dillon Consulting Limited         | 7/29/2015  | 10/28/2016 | Completed - Published as Research Report 173                |                |               |
| 02-61 | Airport Stormwater Management: Electronic Resource Library  | \$450,000(15)<br>\$39,056 (16) | \$489,056       | Mead & Hunt, Inc.                 | 5/11/2015  | 7/31/2017  | Completed - Published as WebResource 3                      |                |               |
| 02-62 | Green Stormwater Infrastructure Strategies for Airports   | \$350,000(15)                  | \$299,970       | The Cadmus Group, LLC             | 4/30/2015  | 11/21/2016 | Completed - Published as Research Report 174, Volumes 1 & 2 |                |               |
| 02-63 | Quantifying Airport Ground Access Vehicle Activity for Emissions Modeling                           | \$300,000(15)                  | \$299,874       | KB Environmental Sciences         | 5/11/2015  | 4/28/2017  | Completed - Published as Research Report 180                |                |               |
| 02-64 | Guidance for Usage of Permeable Pavement at Airports  | \$200,000(15)                  | \$199,906       | Applied Pavement Technology, Inc. | 6/19/2015  | 3/31/2017  | Completed - Published as Research Report 178                |                |               |
| 02-65 | Tracking Alternative Jet Fuel Sonic Boom  | \$250,000(15)                  | \$249,961       | Metron Aviation                   | 6/19/2015  | 7/29/2016  | Completed - Published as Research Report 165                |                |               |
| 02-66 | Commercial Spaceport Noise and Sonic Boom   | \$600,000(15)                  | \$600,000       | Wyle Laboratories, Inc.           | 7/29/2015  | 5/29/2017  | Completed - Published as Research Report 183 and Web Doc 33 |                |               |
| 02-67 | Airport Air Quality Management Guidebook and Resource Library                                       | \$400,000(15)                  | \$399,944       | Booz Allen Hamilton               | 8/7/2015   | 10/16/2017 | Completed - Published as Report 185 and WebResource 4       |                |               |

| No.   | Title   | Allocation    | Contract Amount   | Contractor | Start Date | End Date                                     | Status                     | FAA Liaison(s) | Staff Officer |
|-------|---|---------------|---|------------|------------|--|----------------------------|----------------|---------------|
| 02-68 | Strategies for Reducing Local Stormwater Utility Fees for Airports                            | \$350,000(16) | \$325,000 The Cadmus Group, LLC                                 | 9/21/2016  | 6/29/2018  | Completed - Published as Research Report 193 |                            |                |               |
| 02-69 | Integrating Airport Sustainability and the NEPA Process                                       | \$400,000(16) | \$400,000 Vanasse Hangen Brustlin, Inc.                         | 9/29/2016  | 1/31/2019  | Completed - Publication Pending              | J. Barrilleaux R. Solomon  | J. Navarrete   |               |
| 02-70 | Wetland Mitigation—A Guidebook for Airports   | \$400,000(16) | \$399,996 The Smart Associates, Environmental Consultants, Inc. | 9/29/2016  | 12/31/2018 | Completed - Published as Research Report 198 |                            |                |               |
| 02-71 | Guidebook and Decision Tool for Managing Airport Stormwater Containing Deicers                | \$500,000(16) | \$400,000 Mead & Hunt, Inc.                                     | 8/19/2016  | 12/31/2018 | Completed - Publication Pending              | M. Lamprecht               | J. Navarrete   |               |
| 02-72 | Developing a Comprehensive Renewable Resources Strategy                                       | \$300,000(16) | \$300,000 Cadmus Group, LLC                                     | 9/29/2016  | 8/31/2018  | Completed - Publication Pending              | J. MacFarlane J. Weller    | M. Greenberger |               |
| 02-73 | Interactive Tool for Understanding NEPA at General Aviation Airports                          | \$250,000(16) | \$249,864 RS&H, Inc.  | 8/5/2016   | 3/31/2019  | Completed - Publication Pending              | K.R. Bassarab F. Smigelski | M. Greenberger |               |
| 02-74 | Using Existing Airport Management Systems to Manage Climate Risk                              | \$400,000(16) | \$399,971 ICF Incorporated                                      | 9/23/2016  | 10/31/2018 | Completed - Published as Research Report 188 |                            |                |               |
| 02-75 | Benefit-Cost Analyses Guidebook for Airport Stormwater  | \$450,000(16) | \$325,000 The Cadmus Group, LLC                                 | 9/21/2016  | 12/31/2018 | Completed - Publication Pending              | M. Lamprecht               | J. Navarrete   |               |
| 02-76 | Optimizing the Use of Electric Pre-Conditioned Air (PCA) and Ground Power Systems at Airports | \$300,000(17) | \$300,000 Harris Miller Miller & Hanson Inc.                    | 7/6/2017   | 3/8/2019   | Completed - Publication Pending              | M. Lamprecht J. Upadhyay   | T. Schatz      |               |
| 02-77 | Revolving Funds for Sustainability Projects at Airports                                       | \$350,000(17) | \$350,000 Rocky Mountain Institute                              | 6/6/2017   | 2/5/2019   | Completed - Published as Research Report 205 |                            |                |               |
| 02-78 | Climate Resilience and Benefit Cost Analysis—A Handbook for Airports                          | \$450,000(17) | \$450,000 GRA, Inc.   | 5/18/2017  | 1/14/2019  | Completed - Published as Research Report 199 |                            |                |               |
| 02-79 | AEDT Noise Model Improvements to Account for Terrain and Man-made Structures                  | \$500,000(17) | \$399,995 Blue Ridge Research Consulting                        | 8/1/2017   | 8/30/2019  | Completed - Publication Pending              | J. Byers B. He             | J. Navarrete   |               |

| No.   | Title   | Allocation    | Contract Amount | Contractor                             | Start Date | End Date   | Status                                   | FAA Liaison(s)                       | Staff Officer  |
|-------|---|---------------|-----------------|--|------------|------------|--|--------------------------------------|----------------|
| 02-80 | Quantifying Emissions Reductions at Airports from the Use of Alternative Jet Fuel           | \$500,000(17) | \$499,927       | Booz Allen Hamilton                    | 5/15/2017  | 5/31/2019  | Completed - Published as Web-Only Doc 41 | J. Navarrete                         |                |
| 02-81 | Commercial Space Transportation Noise Measurements  | \$600,000(17) | \$599,898       | Blue Ridge Research and Consulting LLC | 8/1/2017   | 12/31/2019 | Research in Progress                     | J. Johnson<br>N.Sizov<br>S.Zee       | J. Navarrete   |
| 02-82 | Developing a Roadmap to to Achieve Zero-Emissions Status                                    | \$350,000(18) | \$350,000       | Cadmus Group, LLC                      | 6/20/2018  | 10/19/2019 | Research in Progress                     | T. Cuddy                             | M. Greenberger |
| 02-83 | Measuring Quality of Life in Communities Surrounding Airports                               | \$400,000(18) | \$399,840       | Harris Miller, Miller, & Hanson Inc.   | 4/30/2018  | 12/31/2019 | Research in Progress                     | J. Andrus<br>J. Sweat-Essick         | J. Navarrete   |
| 02-84 | Evaluating the Use of Spatially Precise Diurnal Population Data in Aviation Noise Studies   | \$300,000(18) | \$299,993       | Metron Aviation, Inc.                  | 5/8/2018   | 1/7/2020   | Research in Progress                     | B. He<br>J. Byers                    | J. Navarrete   |
| 02-85 | Commercial Space Vehicle Emissions Modeling   | \$450,000(18) | \$449,973       | Blue Ridge Research and Consulting LLC | 6/1/2018   | 5/31/2020  | Research in Progress                     | R. Halthore<br>J. Johnson            | J. Navarrete   |
| 02-86 | Measuring the Impact of Temporary Flight Restriction on Airports                            | \$400,000(18) | \$400,000       | Metron Aviation, Inc.                  | 5/25/2018  | 11/30/2019 | Research in Progress                     | K. Andrus<br>K. Bassarab<br>R. Didio | M. Greenberger |
| 02-87 | Determining Airfield Pavement Deice and Anti-Icer Contributions to Airport Stormwater       | \$400,000(18) | \$350,000       | LimnoTech Inc.                         | 6/1/2018   | 5/31/2020  | Research in Progress                     | M. Lamprecht<br>J. Barrilleaux       | J. Navarrete   |
| 02-88 | Techniques for Modifying NextGen Flight Track Design to Reduce Noise Exposure and Annoyance | \$400,000     | \$0             |  |            |            | Cancelled                                |                                      |                |
| 02-89 | Industry Survey—Benefits and Costs for Airport Noise and Operations Monitoring Systems      | \$250,000     | \$0             |  |            |            | In Development                           |                                      | J. Navarrete   |

| No.                            | Title  | Allocation    | Contract Amount | Contractor                     | Start Date | End Date   | Status  | FAA Liaison(s) | Staff Officer |
|--------------------------------|--|---------------|-----------------|--------------------------------|------------|------------|---|----------------|---------------|
| <b>03: Policy and Planning</b> |  |               |                 |                                |            |            |   |                |               |
| 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                    | 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, LLC            | 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                          | Guidebook for Measuring Performance of Automated People Mover Systems at Airports    | \$300,000(07) | \$300,000       | Lea & Elliott                  | 6/13/2007  | 1/31/2012  | Completed - Published as Report 37A                 |                |               |
| 03-08                          | Passenger Air-Service Development Techniques   | \$300,000(07) | \$300,000       | IntervISTAS Consulting Group   | 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                  |                |               |
| 03-10                          | Innovative Approaches to Addressing Aviation Capacity Issues in Coastal Mega-Regions | \$300,000(07) | \$300,000       | Resource Systems Group         | 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                  |                |               |

| No.   | Title  | Allocation    | Contract Amount | Contractor                          | Start Date | End Date   | Status  | FAA Liaison(s) | Staff Officer |
|-------|--|---------------|-----------------|-------------------------------------|------------|------------|---|----------------|---------------|
| 03-12 | Preparing Peak Period and Operational Profiles - Guidebook                             | \$350,000(08) | \$347,044       | HNTB                                | 8/13/2008  | 10/30/2012 | Completed - Published as Report 82            |                |               |
| 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 Planning Guidebook                                 | \$300,000(08) | \$300,000       | TransSolutions, LLC                 | 8/26/2008  | 3/30/2012  | Completed - Published as Report 67            |                |               |
| 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   | 7/15/2014  | Completed - Published as Web-Only Document 20 |                |               |
| 03-17 | Evaluating Airfield Capacity   | \$525,000(09) | \$525,000       | Leigh Fisher                        | 6/29/2009  | 6/30/2012  | Completed - Published as Report 79            |                |               |
| 03-18 | Operational and Business Continuity Planning for Prolonged Airport Disruptions         | \$350,000(10) | \$348,292       | Risk Solutions International, LLC   | 6/3/2010   | 6/28/2013  | Completed - Published as Report 93            |                |               |
| 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  | 3/15/2015  | Completed - Published as Web-Only Document 22 |                |               |
| 03-20 | Defining and Measuring Aircraft Delay and Airport Capacity Thresholds                  | \$250,000(10) | \$250,000       | TransSolutions, LLC                 | 8/30/2010  | 12/31/2013 | Completed - Published as Report 104           |                |               |
| 03-21 | Developing and Maintaining Support for Your Airport Capacity Project                   | \$300,000(10) | \$299,980       | Mead & Hunt                         | 6/3/2010   | 3/29/2013  | Completed - Published as Report 85            |                |               |
| 03-22 | Addressing Uncertainty About Future Airport Activity Levels in Airport Decision Making | \$350,000(10) | \$350,000       | InterVISTAS Consulting Group        | 7/15/2010  | 7/31/2012  | Completed - Published as Report 76            |                |               |
| 03-23 | Integrating Aviation and Passenger Rail Planning                                       | \$400,000(10) | \$399,452       | Resource Systems Group              | 7/29/2010  | 6/30/2014  | Completed - Published as Report 118           |                |               |

| No.   | Title  | Allocation                    | Contract Amount                               | Contractor | Start Date | End Date  | Status                              | FAA Liaison(s) | Staff Officer |
|-------|--|-------------------------------|---|------------|------------|---|-------------------------------------|----------------|---------------|
| 03-24 | Guidebook for Air Cargo Facility Planning and Development                        | \$400,000(11)                 | \$400,000 CDM/Wilbur Smith                    |            | 7/17/2011  | 5/31/2015   | Completed - Published as Report 143 |                |               |
| 03-25 | Impact of Regulatory Compliance Costs on Small Airports                          | \$300,000(11)                 | \$299,987 Unison Consulting, Inc.             | 6/3/2011   | 1/31/2013  | Completed - Published as Report 90 and Web-Only Document 15 |                                     |                |               |
| 03-26 | Understanding Airline and Passenger Choice in Regions with Multi-Airport Regions | \$250,000(11)                 | \$250,000 IntervISTAS Consulting Group        | 8/4/2011   | 9/30/2013  | Completed - Published as Report 98                          |                                     |                |               |
| 03-27 | Evaluating Methods for Counting Aircraft Operations at Non-Towered Airports      | \$400,000(11)                 | \$400,000 Woolpert                            |            | 11/21/2011 | 11/28/2014  | Completed - Published as Report 129 |                |               |
| 03-28 | The Role of U.S. Airports in the National Economy                                | \$400,000(12)                 | \$399,984 Economic Development Research Group | 7/17/2012  | 1/30/2015  | Completed - Published as Report 132                         |                                     |                |               |
| 03-29 | Effects of Airline Industry Changes on Small- and Non-Hub Airports               | \$300,000(13)                 | \$299,972 GRA, Inc.                           | 7/22/2013  | 4/30/2015  | Completed - Published as Report 142                         |                                     |                |               |
| 03-30 | Unmanned Aircraft Systems (UAS) at Airports: A Primer                            | \$150,000(13)<br>\$50,000(14) | \$199,000 Futron Corporation                  | 8/7/2013   | 6/19/2015  | Completed - Published as Report 144                         |                                     |                |               |
| 03-31 | Aligning Community Expectations with Airport Roles                               | \$500,000(14)                 | \$500,000 Mead & Hunt                         | 6/16/2014  | 10/31/2016 | Completed - Published as WebResource 1                      |                                     |                |               |
| 03-32 | Guidance for Preparing and Using Airport Design Day Flight Schedules             | \$400,000(14)                 | \$349,966 HNTB Corporation                    | 7/17/2014  | 6/17/2016  | Completed - Published as Research Report 163                |                                     |                |               |
| 03-33 | NextGen - Airport Planning and Development                                       | \$500,000(14)                 | \$500,000 Leigh Fisher                        | 7/11/2014  | 9/30/2016  | Completed - Published as Report 150, Volume 5               |                                     |                |               |
| 03-34 | NextGen - Understanding the Airport's Role in Performance-Based Navigation (PBN) | \$500,000(14)                 | \$500,000 Saab Sensis Corporation             | 6/9/2014   | 2/8/2016   | Completed - Published as Report 150, Volume 1               |                                     |                |               |
| 03-35 | Improving Airport Services for International Customers                           | \$600,000(14)                 | \$600,000 Landrum & Brown, Inc.               | 6/6/2014   | 6/10/2016  | Completed - Published as Research Report 161                |                                     |                |               |

| No.   | Title  | Allocation      | Contract Amount | Contractor                   | Start Date | End Date   | Status                                       | FAA Liaison(s)             | Staff Officer  |
|-------|--|-----------------|-----------------|------------------------------|------------|------------|--|----------------------------|----------------|
| 03-36 | Using Disaggregated Socioeconomic Data in Air Passenger Demand Studies                     | \$500,000(15)   | \$499,747       | GRA Incorporated             | 6/19/2015  | 6/28/2018  | Completed - Published as Research Report 194 |                            |                |
| 03-37 | Using GIS for Collaborative Land Use Compatability Near Airports                           | \$350,000(15)   | \$350,000       | Grafton Technologies         | 8/26/2015  | 8/31/2018  | Completed - Published as Research Report 200 |                            |                |
| 03-38 | Understanding FAA Grant Assurance Obligations  | \$150,000(15)   | \$150,000       | Unison Consulting, Inc.      | 7/28/2015  | 5/2/2017   | Completed - Published as Research Report 184 |                            |                |
| 03-39 | Generating Revenue from Commercial Development On or Adjacent to Airports                  | \$375,000(15)   | \$375,000       | Mead & Hunt, Inc.            | 5/11/2015  | 1/31/2017  | Completed - Published as Research Report 176 |                            |                |
| 03-40 | Air Demand in a Dynamic Competitive Context with the Automobile                            | \$500,000(16)   | \$499,816       | Resource Systems Group, Inc. | 7/14/2016  | 2/15/2019  | Completed - Publication Pending              | D. Anderson<br>K. Warden   | L. Goldstein   |
| 03-41 | Common Performance Metrics for Airport Infrastructure and Operational Planning             | \$400,000(16)   | \$399,981       | Booz Allen Hamilton          | 9/23/2016  | 3/22/2018  | Completed - Published as Research Report 190 |                            |                |
| 03-42 | Airports and UAS   | \$1,000,000(17) | \$999,957       | Booz Allen Hamilton          | 2/3/2017   | 6/1/2019   | Completed - Publication Pending              | M. Dipilato<br>J. Raymond  | T. Schatz      |
| 03-43 | Integrating Airport Ground Access and Metropolitan Surface Transportation Planning Efforts | \$500,000(17)   | \$326,173       | WSP                          | 4/27/2017  | 3/29/2019  | Completed - Publication Pending              | M. Lawrence<br>D. Rinsler  | J. Navarrete   |
| 03-44 | Best Practices in Building Air Service Through Incentive Programs                          | \$400,000(17)   | \$324,863       | GRA, Inc.                    | 4/11/2017  | 7/31/2019  | Completed - Publication Pending              | G. Mahns                   | J. Navarrete   |
| 03-45 | Collecting and Sharing of Operational and Safety Data                                      | \$400,000(17)   | \$400,000       | Booz Allen Hamilton          | 5/17/2017  | 2/28/2020  | Research in Progress                         | P. Davenport<br>S. Gardner | M. Greenberger |
| 03-46 | Implementing Privatization: Guidance for Airport Decision-Makers                           | \$350,000(18)   | \$349,985       | WSP                          | 4/24/2018  | 10/30/2019 | Research in Progress                         | R. Fiertz                  | T. Schatz      |

| No.   | Title   | Allocation     | Contract Amount | Contractor                  | Start Date | End Date       | Status               | FAA Liaison(s) | Staff Officer  |
|-------|---|----------------|-----------------|-----------------------------|------------|----------------|----------------------|----------------|----------------|
| 03-47 | Rethinking Airport Parking Facilities to Protect and Enhance Non-Aeronautical Revenue                         | \$450,000(18)  | \$450,000       | Intervistas                 | 4/18/2018  | 10/17/2019     | Research in Progress | L. McDonald    | T. Schatz      |
| 03-48 | Advanced Ground Vehicle Technologies (AGVT) for Airside Operations  | \$250,000(18)  | \$250,000       | Purdue University           | 7/9/2018   | 10/8/2019      | Research in Progress | M. Woods       | M. Greenberger |
| 03-49 | Effective Collaboration to Plan and Respond to Communicable Disease Threats                                   | \$600,000 (19) | \$600,000       | Eastern Research Group, Inc | 3/15/2019  | 1/14/2021      | Research in Progress | M. Woods       | M. Greenberger |
| 03-50 | An Airport-Centric Study of the Urban Air Mobility Market   | \$350,000 (19) | \$350,000       | Ascension Group             | 7/3/2019   | 10/2/2020      | Research in Progress | N. Sizou       | J. Navarrete   |
| 03-51 | Electric Aircraft on the Horizon—an Airport Planning Perspective  | \$450,000 (19) | \$449,820       | WSP USA, Inc.               | 6/14/2019  | 12/13/2020     | Research in Progress | M. Washington  | J. Navarrete   |
| 03-52 | Airport Common Use Program Development Guidebook  | \$400,000 (20) | \$0             |                             |            | In Development | C. Nutting           | J. Navarrete   |                |
| 03-53 | Development of Baggage Handling System Decision Making Framework Based on Total Cost of Ownership             | \$340,000 (20) | \$0             |                             |            | In Development | T. Schatz            |                |                |
| 03-54 | General Aviation Airports Runway Length Analysis  | \$300,000 (20) | \$0             |                             |            | In Development | J. Navarrete         |                |                |
| 03-55 | Airport Biometrics—A Primer   | \$250,000 (20) | \$0             |                             |            | In Development | T. Schatz            |                |                |
| 03-56 | Airside Planning, Design, and Operations: Electronic Resource Library   | \$300,000 (20) | \$0             |                             |            | In Development | T. Schatz            |                |                |
| 03-57 | Understanding Coming Improvements and Transformations in Wireless Connectivity: Concepts for Smarter Airports | \$400,000 (20) | \$0             |                             |            | In Development | T. Schatz            |                |                |

| No.               | Title  | Allocation     | Contract Amount | Contractor  | Start Date | End Date   | Status   | FAA Liaison(s) | Staff Officer |
|-------------------|--|----------------|-----------------|---|------------|------------|--|----------------|---------------|
| 03-58             | Measuring the Effect of Changes in Air Service Connectivity on Regional Economic Development | \$500,000 (20) | \$0             |   |            |            | In Development   |                | J. Navarrete  |
| <b>04: Safety</b> |  |                |                 |   |            |            |  |                |               |
|                   |  |                |                 |   |            |            |  |                |               |
| 04-01             | Analysis of Aircraft Overruns and Undershoots for Runway Safety Areas                        | \$250,000(06)  | \$249,986       | Applied Research Associates                         | 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             | Guidebook for Approach Light System Hazard Assessment and Mitigation                         | \$300,000(07)  | \$300,000       | Virginia Polytechnic Institute and State University | 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)  | \$499,093       | Applied Research Associates                         | 9/12/2007  | 12/31/2011 | Completed - Results to 04-04A  |                |               |
| 04-04A            | Evaluating the Airport Emergency Response Operations Simulation (AEROS) Tool                 | \$300,000(12)  | \$290,000       | Futron Corporation                                  | 6/18/2013  | 9/17/2014  | Terminated   |                |               |
| 04-04B1           | Emergency Management Training for Airport Critical Incidents                                 | \$125,000(15)  | \$25,000        | Engineering and Computer Simulations, Inc.          | 3/30/2015  | 8/31/2015  | Completed  |                |               |
| 04-04B2           | Emergency Management Training for Airport Critical Incidents                                 | \$125,000(15)  | \$219,000       | Emergency Preparedness Solutions, LLC               | 6/8/2016   | 3/30/2018  | Completed - Published as Research Report 187                               |                |               |
| 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   |                |               |

| No.    | Title   | Allocation     | Contract Amount | Contractor                            | Start Date | End Date   | Status  | FAA Liaison(s) | Staff Officer |
|--------|---|----------------|-----------------|---------------------------------------|------------|------------|---|----------------|---------------|
| 04-07  | Airport Apron Management and Control Programs   | \$300,000(08)  | \$300,000       | Ricundo & Associates                  | 5/8/2009   | 8/30/2011  | Completed - Published as Report 62                  |                |               |
| 04-07A | Use of Towbarless Tractors at Airports - Best Practices   | \$300,000(08)  | \$38,795        | Ricundo & Associates                  | 4/20/2009  | 8/30/2011  | Completed - Published as Research Results Digest 15 |                |               |
| 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, Inc. | 7/6/2010   | 3/1/2012   | Completed - Published as Report 73                  |                |               |
| 04-11  | Guidebook on Integrating GIS in Emergency Management at Airports                                    | \$350,000(11)  | \$274,949       | Barich, Inc.                          | 7/12/2011  | 2/28/2013  | Completed - Published as Report 88                  |                |               |
| 04-12  | Integrating Web-Based Emergency Management Collaboration Tools into Airport Operations - A Primer   | \$400,000(11)  | \$400,000       | Innovative Emergency Management       | 7/15/2011  | 7/31/2013  | Completed - Published as Report 94                  |                |               |
| 04-13  | Integrating Community Emergency Response Teams at Airports (A-CERTS)                                | \$400,000(11)  | \$400,000       | Innovative Emergency Management, Inc. | 7/26/2011  | 7/26/2013  | Completed - Published as Report 95                  |                |               |
| 04-14  | Development of a Runway Veer-Off Location Distribution Risk Assessment Model and Reporting Template | \$200,000(12)  | \$200,000       | Airport Safety Management Consultants | 6/6/2012   | 12/5/2013  | Completed - Published as Report 107                 |                |               |
| 04-15  | Airport Terminal Incident Response Planning   | \$325,000(12)  | \$325,000       | Innovative Emergency Management, Inc  | 7/10/2012  | 4/2/2014   | Completed - Published as Report 112                 |                |               |
| 04-16  | Safety Risk Management for Airports   | \$300,000(13)  | \$299,992       | Futron Corporation                    | 6/18/2013  | 11/14/2014 | Completed - Published as Report 131                 |                |               |

| No.                 | Title  | Allocation     | Contract Amount                           | Contractor | Start Date | End Date   | Status                                       | FAA Liaison(s)                | Staff Officer  |
|---------------------|--|----------------|---|------------|------------|------------|--|-------------------------------|----------------|
| 04-17               | Applying an SMS Approach to Wildlife Hazard Management                                   | \$250,000(13)  | \$250,000 BASH Incorporated               |            | 1/17/2014  | 6/15/2015  | Completed - Published as Report 145          |                               |                |
| 04-18               | Runway Protection Zone (RPZ) Risk Assessment Tool  | \$400,000(14)  | \$400,000 Applied Research Associates     |            | 6/4/2014   | 7/11/2016  | Completed - Published as Research Report 168 |                               |                |
| 04-19               | Airport Emergency Planning Template: NiIMS - Incident Command System Compliance          | \$300,000(15)  | \$300,000 FTI Consulting, Inc.            |            | 12/3/2015  | 8/31/2018  | Completed - See 04-19A                       | M. Tonnacilff                 | J. Navarrete   |
| 04-19A              | Airport Emergency Planning Template Tool Enhancements                                    | \$190,000 (19) | \$190,000 Ankura Consulting, Inc.         |            | 3/15/2019  | 8/21/2021  | Research in Progress                         | M. Tonnacilff<br>J. Showalter | J. Navarrete   |
| 04-20               | Design Considerations for Airport EOCs   | \$400,000(16)  | \$249,900 Faith Group, LLC                |            | 8/23/2016  | 3/30/2018  | Completed - Published as Research Report 189 |                               |                |
| 04-21               | Emergency Communication Models for Persons with Disabilities and Non-English Speakers    | \$400,000(17)  | \$400,000 Innovative Emergency Management |            | 5/18/2017  | 11/18/2018 | Completed- Published as Research Report 201  |                               |                |
| 04-22               | Evaluating Compatability Zoning at General Aviation Airports                             | \$350,000(17)  | \$350,000 Mead & Hunt                     |            | 5/23/2017  | 1/31/2019  | Completed - Publication Pending              | H. Cyrus<br>M. Hovan          | M. Greenberger |
| 04-23               | Guidebook for Creating and Maintaining Social Media for Emergency Management at Airports | \$350,000(18)  | \$350,000 Barich Inc                      |            | 3/12/2018  | 2/15/2020  | Research in Progress                         | J. Showalter<br>M. Tonnacilff | M. Greenberger |
| 04-24               | Airport Contributions to the Study, Investigation, and Interdiction of Human Trafficking | \$500,000      | \$0                                       |            |            |            | In Development                               |                               | J. Navarrete   |
| <b>05: Security</b> |  |                |   |            |            |            |  |                               |                |
| 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           |                               |                |
| 05-02               | Guidebook on Best Practices for Airport Cybersecurity                                    | \$350,000(13)  | \$350,000 Grafton Technologies, Inc.      |            | 8/21/2013  | 3/31/2015  | Completed - Published as Report 140          |                               |                |

| No.                        | Title   | Allocation     | Contract Amount | Contractor                         | Start Date | End Date   | Status                                       | FAA Liaison(s) | Staff Officer |
|----------------------------|---|----------------|-----------------|------------------------------------|------------|------------|--|----------------|---------------|
| <b>06: Human Resources</b> |   |                |                 |                                    |            |            |  |                |               |
| 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  | 10/30/2012 | Completed - Published as Report 75           |                |               |
| 06-03                      | Establishing a Coordinated Local Family Assistance Program for Airports         | \$300,000(15)  | \$300,000       | Tetra Tech, Inc.                   | 5/8/2015   | 10/14/2016 | Completed - Published as Research Report 171 |                |               |
| 06-04                      | Identifying and Evaluating Airport Workforce Requirements                       | \$250,000(15)  | \$580,760       | ICF Incorporated                   | 6/4/2015   | 4/15/2018  | Completed - Published as Research Report 186 |                |               |
| 06-05                      | Guidance for Diversity in Airport Businesses Contracting and Workforce Programs | \$500,000(18)  | \$500,000       | The Cadmus Group                   | 5/25/2018  | 9/24/2019  | Completed - Publication Pending              | N. Kumar       | T. Schatz     |
| 06-06                      | Cultivating Talent in the Airport Environment                                   | \$250,000(19)  | \$250,000       | ICF Incorporated                   | 5/24/2019  | 8/23/2020  | Research in Progress                         | R. Didio       | T. Schatz     |
| 06-07                      | Enhancing Academic Programs to Cultivate Future Airport Industry Professionals  | \$300,000 (19) | \$300,000       | The Ohio State University          | 6/1/2019   | 8/31/2020  | Research in Progress                         | T. Cuddy       | T. Schatz     |
| 06-08                      | Human Factors in Airport Operations   | \$400,000 (19) | \$0             | Futron Aviation                    | 7/19/2019  | 3/21/2021  | In Development                               | M. Greenberger |               |
| <b>07: Design</b>          |   |                |                 |                                    |            |            |  |                |               |
| 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)  | \$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           |                |               |

| No.   | Title   | Allocation    | Contract Amount                                 | Contractor | Start Date | End Date   | Status                                       | FAA Liaison(s) | Staff Officer |
|-------|---|---------------|---|------------|------------|------------|--|----------------|---------------|
| 07-04 | Airport Passenger Terminal Planning and Design: Spreadsheet Models and User's Guide     | \$400,000(07) | \$400,000 Landrum & 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 & 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           |                |               |
| 07-07 | Evaluating Terminal Renewal Versus Replacement Options                                  | \$400,000(10) | \$400,000 Ricundo & Associates                  |            | 8/16/2010  | 3/15/2012  | Completed - Published as Report 68           |                |               |
| 07-08 | Improving Terminal Design to Increase Revenue Generation and Customer Satisfaction      | \$500,000(11) | \$496,888 Landrum & Brown                       |            | 6/3/2011   | 11/30/2013 | Completed - Published as Report 109          |                |               |
| 07-09 | Apron Planning and Design Guidebook   | \$250,000(12) | \$250,000 Ricundo & Associates                  |            | 6/15/2012  | 7/31/2013  | Completed - Published as Report 96           |                |               |
| 07-10 | General Aviation Facility Planning  | \$300,000(12) | \$300,000 Delta Airport Consultants             |            | 5/17/2012  | 2/28/2014  | Completed - Published as Report 113          |                |               |
| 07-11 | Airport Escalators and Moving Walkways - Cost-Savings and Energy Reduction Technologies | \$250,000(12) | \$249,947 Project Performance Corp.             |            | 9/18/2012  | 7/31/2014  | Completed - Published as Report 117          |                |               |
| 07-12 | Guidebook for Airport Terminal Restroom Planning and Design                             | \$250,000(12) | \$249,986 Architectural Alliance                |            | 3/25/2013  | 9/30/2014  | Completed - Published as Report 130          |                |               |
| 07-13 | Enhancing Airport Wayfinding for the Aging Travelers and Persons with Disabilities      | \$450,000(14) | \$450,000 Gresham Smith & Partners              |            | 6/9/2014   | 2/17/2017  | Completed - Published as Research Report 177 |                |               |
| 07-14 | Improving Intelligibility of Airport Terminal Public-Address Systems                    | \$350,000(15) | \$350,000 Wilson Ihrig & Associates             |            | 7/7/2015   | 1/7/2017   | Completed - Published as Research Report 175 |                |               |
| 07-15 | Airport Passenger Terminal Design: Electronic Resources Library                         | \$300,000(15) | \$300,000 Intermodal Logistics Consulting, Inc. |            | 7/7/2015   | 5/15/2017  | Completed - Published as WebResource 2       |                |               |

| No.                     | Title  | Allocation     | Contract Amount | Contractor                            | Start Date | End Date   | Status                                       | FAA Liaison(s)              | Staff Officer |
|-------------------------|--|----------------|-----------------|---------------------------------------|------------|------------|--|-----------------------------|---------------|
| 07-15A                  | Airport Passenger Terminal Design Library-Updates to ACRP WebResource 2  | \$250,000(19)  | \$250,000       | Intermodal Logistics Consulting, Inc. | 5/24/2019  | 5/23/2022  | Research in Progress                         | W. Reinhardt                | T. Schatz     |
| 07-16                   | Airport Terminal Ancillary Service Spaces and Restroom Planning and Design   | \$350,000(18)  | \$349,837       | Alliance                              | 2/28/2018  | 5/21/2020  | Research in Progress                         | W. Reinhardt<br>M. Sedorous | J. Navarrete  |
| 07-17                   | Update ACRP Report 40: Airport Curbside and Terminal Area Roadway Operations                                       | \$500,000 (20) | \$0             |                                       |            |            | In Development                               |                             |               |
| 07-18                   | Develop Airfield Design Guidelines for Unmanned Aerial Vehicles  | \$400,000 (20) | \$0             |                                       |            |            | In Development                               |                             | T. Schatz     |
| <b>08: Construction</b> |  |                |                 |                                       |            |            |  |                             |               |
| 08-01                   | Sustainable Airport Construction Practices   | \$150,000(09)  | \$150,000       | Ricundo & Associates                  | 6/1/2009   | 6/22/2010  | Completed - Published as Report 42           |                             |               |
| 08-02                   | Guidebook for Integrating Collaborative Partnering into Traditional Airport Practices                              | \$350,000(17)  | \$350,000       | Michigan State University             | 5/11/2017  | 1/31/2019  | Completed - Published as Research Report 196 |                             |               |
| 08-03                   | Construction Safety and Phasing Plans  | \$250,000(19)  | \$250,000       | Garver                                | 8/21/2019  | 11/20/2020 | Research in Progress                         | M. Greenberger              |               |
| <b>09: Maintenance</b>  |  |                |                 |                                       |            |            |  |                             |               |
| 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           | 11/6/2006  | 4/30/2010  | Completed - Published as Report 39           |                             |               |
| 09-02                   | Best Practices Manual for Working in or Near Airport Movement Areas  | \$500,000(11)  | \$325,000       | Ricundo & Associates                  | 8/31/2011  | 11/30/2013 | Completed - Published as Report 101          |                             |               |

| No.   | Title   | Allocation    | Contract Amount | Contractor  | Start Date | End Date   | Status  | FAA Liaison(s) | Staff Officer |
|-------|---|---------------|-----------------|---|------------|------------|---|----------------|---------------|
| 09-03 | Airport Parking Garage Lighting Solutions   | \$300,000(12) | \$300,000       | Virginia Polytechnic Institute and State University | 6/4/2012   | 10/31/2014 | Completed - Published as Report 124           |                |               |
| 09-04 | Optimizing Airport Building Operations and Maintenance Through Retrocommissioning: A Whole Systems Approach | \$250,000(12) | \$249,835       | Sebesta Bloomberg & Associates                      | 12/14/2012 | 12/31/2014 | Completed - Published as Report 139           |                |               |
| 09-05 | Guidance on Successful Computer Maintenance Management Systems (CMMMS) Selection and Practices              | \$300,000(12) | \$300,000       | Ross & Barrunzini                                   | 7/12/2012  | 10/17/2014 | Completed - Published as Web-Only Document 23 |                |               |
| 09-06 | Evaluating Impacts of Sustainability Practices on Airport Operations and Maintenance                        | \$300,000(12) | \$312,000       | Booz Allen Hamilton                                 | 9/27/2012  | 4/25/2014  | Completed- Published as Report 110            |                |               |
| 09-07 | Airport Maintenance Roles in Planning, Design, Construction, Commissioning, and Activation                  | \$200,000(12) | \$200,000       | Michigan State University                           | 11/13/2012 | 10/31/2014 | Completed                                     |                |               |
| 09-08 | Balancing Airport Stormwater and Bird Hazard Management   | \$250,000(12) | \$249,209       | Environmental Resource Solutions                    | 10/1/2012  | 8/29/2014  | Completed - Published as Report 125           |                |               |
| 09-09 | LED Airfield Lighting System Operation and Maintenance  | \$340,000(13) | \$340,000       | Burns Engineering                                   | 8/9/2013   | 9/30/2015  | Completed - Published as Report 148           |                |               |
| 09-10 | Benchmarking and Profiling Airport Terminal End Uses  | \$400,000(13) | \$399,331       | Texas A&M University                                | 9/16/2013  | 9/30/2015  | Completed - Published as CRP CD 178           |                |               |
| 09-11 | Pavement Maintenance Guidelines for General Aviation Airport Management                                     | \$350,000(14) | \$350,000       | Texas A&M University Transportation Institute       | 6/16/2014  | 5/13/2016  | Completed - Published as Report 159           |                |               |
| 09-12 | NextGen - Leveraging NextGen Spatial Data to Benefit Airports   | \$200,000(14) | \$200,000       | Woolpert, Inc.                                      | 6/13/2014  | 6/3/2016   | Completed - Published as Report 150, Volume 4 |                |               |
| 09-13 | Considering Life Cycle Costs in Airport Asset Procurement   | \$350,000(15) | \$349,897       | CH2M Hill   | 5/19/2015  | 11/18/2016 | Completed - Published as Research Report 172  |                |               |

| No.                   | Title  | Allocation                                     | Contract Amount | Contractor                         | Start Date | End Date   | Status  | FAA Liaison(s) | Staff Officer  |
|-----------------------|--|--|-----------------|------------------------------------|------------|------------|---|----------------|----------------|
| 09-14                 | Advanced Computer Maintenance Management System (CMMS) Integration for Airports    | \$375,000(16)                                  | \$374,950       | CH2M Hill                          | 6/9/2016   | 9/8/2017   | Completed - Published as Web-Only Document 23                 |                | M. Greenberger |
| 09-15                 | Building Information Modeling (BIM) Beyond Design                                  | \$750,000(17)                                  | \$400,000       | CAD Concepts                       | 5/12/2017  | 6/30/2019  | Completed - Publication Pending                               | D. Rinsler     | M. Greenberger |
| 09-16                 | Best Practices for Airport Obstruction Management                                  | \$300,000(17)                                  | \$299,981       | Hanson Professional Services       | 2/15/2017  | 12/31/2018 | Completed- Published as Research Report 195 and WebResource 7 |                |                |
| 09-17                 | Collecting, Applying, and Maintaining Pavement Condition Data at Airports          | \$250,000(17)                                  | \$250,000       | Applied Pavement Technology, Inc.  | 4/17/2017  | 12/31/2018 | Completed- Published as Research Report 203                   |                |                |
| 09-18                 | Rapid Airfield Concrete Pavement Slab Replacement and Patching                     | \$400,000(19)                                  | \$400,000       | Nichols Consulting Engineers       | 4/24/2019  | 7/23/2020  | In Development  | M. Greenberger |                |
| 09-19                 | Airfield Pavement Markings- Effective Removal and Temporary Application Techniques | \$450,000(19)                                  | \$450,000       | Texas A&M Transportation Institute | 6/1/2019   | 11/30/2020 | Research in Progress  | J. Carlini     | T. Schatz      |
| 09-20                 | Consequences of Delayed Maintenance of Airport Assets                              | \$300,000                                      | \$0             |                                    |            |            | In Development  |                |                |
| <b>10: Operations</b> |  |  |                 |                                    |            |            |   |                |                |
| 10-01                 | Optimizing the Use of Aircraft Deicing and Anti-Icing Fluids                       | \$300,000(06)<br>\$50,000(08)<br>\$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           |                |                |

| No.    | Title  | Allocation    | Contract Amount | Contractor                   | Start Date | End Date   | Status  | FAA Liaison(s) | Staff Officer |
|--------|--|---------------|-----------------|------------------------------|------------|------------|---|----------------|---------------|
| 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                          |                |               |
| 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  | 4/30/2012  | Completed - Published as Report 70                          |                |               |
| 10-09  | Elimination or Reduction of Baggage Recheck for Arriving International Passengers            | \$400,000(09) | \$400,000       | IntervISTAS Consulting Group | 7/22/2009  | 10/31/2011 | Completed - Published as Report 61                          |                |               |
| 10-10  | Guidebook for Airport Irregular Operations (IROPS) Contingency Planning                      | \$600,000(10) | \$599,976       | Mead & Hunt                  | 8/26/2010  | 2/24/2012  | Completed - Published as Report 65                          |                |               |
| 10-10A | Guidebook for Airport Irregular Operations (IROPS) Contingency Planning - Training Sessions  | \$300,000(12) | \$151,053       | Mead & Hunt                  | 2/24/2012  | 1/31/2013  | Completed - Training Sessions Held                          |                |               |
| 10-11  | Guidebook to Creating a Collaborative Environment Between Airport Operations and Maintenance | \$500,000(11) | \$399,840       | Amadeus Consulting           | 7/27/2011  | 4/30/2013  | Completed - Published as Report 92                          |                |               |
| 10-12  | Guidebook for Through-the-Fence (TTF) Operations   | \$350,000(12) | \$350,000       | Mead & Hunt                  | 7/30/2012  | 2/28/2014  | Completed - Published as Report 114                         |                |               |
| 10-13  | A Guidebook for Integrating NIMS for Personnel and Resources at Airports                     | \$200,000(12) | \$200,000       | System Planning Corp.        | 5/23/2012  | 8/24/2013  | Completed - Published as Report 103                         |                |               |
| 10-14  | Being Prepared for IROPS: A Business Planning and Decision-Making Approach                   | \$300,000(12) | \$299,395       | MCR Federal, LLC             | 8/2/2012   | 11/4/2013  | Completed - Published as Report 106                         |                |               |

| No.    | Title   | Allocation    | Contract Amount | Contractor                     | Start Date | End Date   | Status   | FAA Liaison(s) | Staff Officer |
|--------|---|---------------|-----------------|--------------------------------|------------|------------|--|----------------|---------------|
| 10-15  | Guidebook for Airport Winter Operations                                     | \$400,000(12) | \$400,000       | Gresham, Smith and Partners    | 6/25/2012  | 8/29/2014  | Completed - Published as Report 123                          |                |               |
| 10-16  | Commercial Ground Transportation at Airports: Best Practices                | \$300,000(13) | \$300,000       | Leigh Fisher                   | 7/10/2013  | 5/8/2015   | Completed - Published as Report 146 and Web-Only Document 25 |                |               |
| 10-17  | Implementing Integrated Self-Service at Airports                            | \$450,000(13) | \$449,980       | Bairch, Inc.                   | 8/5/2013   | 2/4/2015   | Completed - Published as Report 136                          |                |               |
| 10-18  | Preventative Maintenance at General Aviation Airports: Primer and Guidebook | \$400,000(13) | \$299,496       | Delta Airport Consultants      | 9/18/2013  | 2/18/2015  | Completed - Published as Report 138                          |                |               |
| 10-19  | Guidebook for Advancing Collaborative Decision Making (CDM) at Airports     | \$300,000(13) | \$299,783       | Mosaic ATM, Inc.               | 9/3/2013   | 12/3/2014  | Completed - Published as Report 137                          |                |               |
| 10-20  | Guidance for Planning, Design, and Operations of Airport Communications     | \$300,000(13) | \$251,700       | TranSecure, Inc.               | 8/9/2013   | 1/15/2015  | Completed - Published as Research Report 182                 |                |               |
| 10-20A | Guidance for Planning, Design, and Operations of Airport Communications     | \$98,325(13)  | \$98,325        | Burns Engineering, Inc.        | 3/9/2016   | 4/1/2017   | Completed - Published as Research Report 182                 |                |               |
| 10-21  | Complying with Federal Regulations: An Integrated Approach                  | \$350,000(14) | \$350,000       | Aviation Management Consulting | 6/27/2014  | 12/31/2015 | Completed - Published as Report 156                          |                |               |
| 10-22  | Improving Stakeholder Engagement in Aircraft Accident Planning              | \$500,000(14) | \$499,988       | Futron Corporation             | 4/18/2014  | 1/15/2017  | Completed - Published as Web-Only Document 31                |                |               |
| 10-23  | IROPS Stakeholder Communication and Coordination                            | \$400,000(14) | \$399,930       | Metron Aviation, Inc.          | 6/9/2014   | 12/8/2015  | Completed - Published as Report 153                          |                |               |
| 10-24  | Guidance for Developing Ramp Control Facilities                             | \$400,000(15) | \$399,997       | Metron Aviation, Inc.          | 4/24/2015  | 7/23/2016  | Completed - Published as Research Report 167                 |                |               |
| 10-25  | Public-Notification Programs at Airports                                    | \$200,000(15) | \$194,600       | SSI, Inc.                      | 7/1/2015   | 8/31/2016  | Completed - Published as Research Report 170                 |                |               |

| No.                         | Title  | Allocation  | Contract Amount               | Contractor               | Start Date | End Date                            | Status                    | FAA Liaison(s)                  | Staff Officer |
|-----------------------------|--|---|-------------------------------|--------------------------|------------|-------------------------------------|---------------------------|---------------------------------|---------------|
| 10-26                       | Airport Microgrid Implementation Toolkit   | \$450,000(18)   | \$450,000                     | Rocky Mountain Institute | 6/22/2018  | 1/31/2020                           | Research in Progress      | J. Wolfers-Lawrence<br>T. Cuddy | T. Schatz     |
| 10-27                       | Using Collaborative Decision Making to Enhance the Management of Adverse Conditions, IROPS, and Crises | \$300,000(19)   | \$300,000                     | WSP                      | 7/8/2019   | 7/7/2020                            | Research in Progress      |                                 | T. Schatz     |
| 10-28                       | Guide for Integrating Crisis Management and Business Continuity at Airports                            | \$500,000 (20)  | \$0                           |                          |            |                                     | In Development            |                                 |               |
| 10-29                       | Development of Predictive Model for Jet Blast Exposure   | \$450,000 (20)  | \$0                           |                          |            |                                     | In Development            |                                 | J. Navarrete  |
| <b>11: Special Projects</b> |  |   |                               |                          |            |                                     |                           |                                 |               |
| 11-01                       | Legal Aspects of Airport Programs  | \$200,000(06)<br>\$475,000(07)<br>\$300,000(08)<br>\$600,000(09)<br>\$500,000(10)<br>\$50,000(11)<br>\$200,000(12)<br>\$50,000(13)<br>\$200,000(14)<br>\$350,000(15)<br>\$200,000(16)<br>\$75,000(17)<br>\$240,000(18)<br>\$240,000(19) | Transportation Research Board | 2/1/2006                 |            | Continuing Project: See 11-01 Table | D. Fuller<br>F. SanMartin | T. Schatz                       |               |

| 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)<br>\$467,000(07)<br>\$1,000,000(08)<br>\$25,000(09)<br>\$250,000(10)<br>\$100,000(11)<br>\$40,000(12)<br>\$216,000(13)<br>\$123,576(14)<br>\$250,000(15)<br>\$149,500(17)<br>\$230,000(18)<br>\$300,000(19)                                 | Various   | 2/1/2006   | Continuing Project: See<br>11-02 Table                                     |          | L. Miller    | M.<br>Greenberger |               |
| 11-03  | Synthesis of Information Related to Airport Practices            | \$500,000(06)<br>\$700,000(07)<br>\$500,000(08)<br>\$500,000(09)<br>\$900,000(10)<br>\$700,000(11)<br>\$1,270,000(12)<br>\$1,160,000(13)<br>\$1,053,000(14)<br>\$1,170,000(15)<br>\$1,220,000(16)<br>\$1,220,000(17)<br>\$1,220,000(18)<br>\$ 495,000(19) | Transportation Research Board   | 2/1/2006   | Continuing Project: See<br>11-03 Table 3, 4, 8,<br>12,13,17,18, 22, and 23 |          | P. Magnotta  | T. Schatz         |               |
| 11-04  | Graduate Research Award Program on Public-Sector Aviation Issues | \$100,000(08)<br>\$100,000(09)<br>\$100,000(10)<br>\$140,000(11)<br>\$140,000(12)<br>\$140,000(13)<br>\$140,000(14)<br>\$568,779(15)<br>\$907,580(16)<br>\$507,409(17)<br>\$632,627(18)<br>\$595,000(19)  | Transportation Research Board (08-13)<br>Old Dominion University Research Foundation (14) | Continuing Project:<br>Papers Published as TRB<br>TRR 2184, 2206, 2266,<br>2325, 2400, and 2471;<br>Status Reports Published<br>as Research Results<br>Digests 14, 19, and 25. |  | R. Samis | L. Goldstein |                   |               |
| 11-04A | Airport Research Competition for Universities                    | Included in 11-04 (15)(16)<br>(17) (18) (19)  | Old Dominion University Research Foundation   | 5/9/2014   | 12/31/2020 Research in Progress  |          | R. Samis     | L. Goldstein      |               |

| No.          | Title  | Allocation      | Contract Amount | Contractor                    | Start Date | End Date   | Status  | FAA Liaison(s) | Staff Officer  |
|--------------|--|-----------------|-----------------|-------------------------------|------------|------------|---|----------------|----------------|
| 11-05        | Implementation of ACRP Strategic Plan  | \$600,000(10)   | Various         |                               |            |            | Continuing Project                                  | J. Showalter   | M. Greenberger |
|              |  | \$148,947(11)   |                 |                               |            |            |   |                |                |
|              |  | \$200,000(12)   |                 |                               |            |            |   |                |                |
|              |  | \$600,000(13)   |                 |                               |            |            |   |                |                |
|              |  | \$600,000(14)   |                 |                               |            |            |   |                |                |
|              |  | \$650,000(15)   |                 |                               |            |            |   |                |                |
|              |  | \$1,250,000(16) |                 |                               |            |            |   |                |                |
|              |  | \$600,000(17)   |                 |                               |            |            |   |                |                |
|              |  | \$900,000(18)   |                 |                               |            |            |   |                |                |
|              |  | \$900,000(19)   |                 |                               |            |            |   |                |                |
| 11-06        | Evaluating ACRP Processes  | \$250,000(10)   |                 | Transportation Research Board |            |            | Completed - Results to AOC                          |                |                |
| 11-07        | ACRP Problem Statement Development   | \$500,000(13)   | \$300,000(14)   | Transportation Research Board |            |            | Completed - Published as Research Results Digest 20 |                |                |
| 11-08        | ACRP Insight Events - Discussions on Critical Issues in the Airport Industry   | \$600,000(16)   |                 | Transportation Research Board |            |            | Continuing Project                                  |                | M. Greenberger |
| 11-08(16-01) | Forum on Challenges to Implementing Successful Land Use Strategies at Airports | \$100,000(16)   | \$100,000       | The Cadmus Group, LLC         | 11/9/2016  | 9/30/2018  | Completed - Published as CPW 24                     |                |                |
| 11-08(16-02) | Forum on Economic and Social Sustainability at Airports                        | \$100,000(16)   | \$100,000       | The Cadmus Group, LLC         | 11/9/2016  | 9/30/2018  | Completed - Published as CPW 23                     |                |                |
| 11-08(16-03) | Forum on Airport Roles in Reducing Communicable Diseases Transmission          | \$100,000(16)   | \$100,000       | Eastern Research Group, Inc.  | 12/13/2016 | 12/11/2019 | Completed - Published Conference Proceedings 55     |                |                |
| 11-08(16-04) | Public Private Partnerships - What Are the Lessons Learned?                    | \$100,000(16)   | \$119,994       | Eastern Research Group        | 10/13/2017 | 12/11/2019 | Completed - Publication Pending                     | T. Schatz      |                |
| 11-08(19-01) | Blockchain Technology and Airports   | \$120,000       | \$119,929       | Eastern Research Group        | 3/21/2019  | 12/31/2020 | Research in Progress                                | T. Schatz      |                |

## 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 LLP       | December 2006 | Completed - Published as Legal Research Digest 4 (CRP-CD-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                          | Canceled                      |               |  |               |
| 02-01 | Obstructions Affecting Navigable Airspace   | Cheek & Associates            | July 2008     | Incorporated into 02-05                                      |               |
| 02-02 | Use and Success of Aviation Easements 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 Howick, Esq.             | October 2008  | Completed - Published as Legal Research Digest 10            |               |

| No.   | Title   | Consultant                  | Start Date     | Estimated Completion Date                                      | Staff Officer |
|-------|---|-----------------------------|----------------|--|---------------|
| 02-05 | Practices to Achieve Airport-Compatible Land Uses and Minimize Obstructions in Navigable Airspace   | Jocelyn Waite               | August 2010    | Completed - Published as Legal Research Digest 14              |               |
| 03-01 | Fair Disclosure and Airport Impact Statements in Real Estate Transfers  | Larry Thomas, Esq.          | July 2009      | Completed - Published as Legal Research Digest 12              |               |
| 03-02 | Compilation of State Aviation Authorizing Legislation   | Jodi Howick, Esq.           | August 2009    | Completed - Published as Legal Research Digest 15              |               |
| 03-03 | Survey of Minimum Standards: Commercial Aeronautical Activities at Airports   | Kaplan Kirsch Rockwell, LLP | July 2009      | Completed - Published as Legal Research Digest 11              |               |
| 03-04 | Airport Rates and Charges: Law and Policy   | Spiegel & McDiarmid LLP     | November 2009  | Completed - Incorporated into 4-05                             |               |
| 03-05 | State and Federal Regulations That May Affect Initiatives to Reduce Airports' GHG Emissions   | Kaplan Kirsch Rockwell, LLP | November 2009  | Completed - Published as Legal Research Digest 17              |               |
| 03-06 | An Index and Digest of Decisions: Compilation of Airport Law Resources  | Kaplan Kirsch Rockwell, LLP | December 2009  | Completed - Published as Legal Research Digest 13 (CRP-CD-108) |               |
| 04-01 | Airport Responsibility for Wildlife Management  | Broad and Cassell           | April 2011     | Completed - Published as Legal Research Digest 20              |               |
| 04-02 | Legal Issues Related to Developing Safety Management Systems and Safety Risk Management at U.S. Airports  | Foley & Lardner             | December 2011  | Completed - Published as Legal Research Digest 19              |               |
| 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 | CDM                         | September 2012 | Completed - Published as Legal Research Digest 25              |               |
| 04-04 | Buy America Requirements for Federally Funded Airports  | Conner Gwyn Schenk          | March 2011     | Completed - Published as Legal Research Digest 18              |               |
| 04-05 | Compilation of DOT and FAA Airport Legal Determinations and Opinion Letters Through December 2012   | Spiegel & McDiarmid LLP     | February 2012  | Completed - Published as Legal Research Digest 21 (CRP-CD-141) |               |

| 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 | Conner Gwyn Schenk          | March 2012     | Completed - Published as Legal Research Digest 22 |               |
| 04-07 | Procurement of Airport Development and Planning Contracts  | Broad and Cassell           | April 2011     | Completed - Published as Legal Research Digest 16 |               |
| 05-01 | Regulations Affecting the Exercise of First Amendment Activities at Airports   | Jodi Howick, Esq.           | August 2013    | Completed - Published as Legal Research Digest 26 |               |
| 05-02 | Sovereign Immunity for Public Airport Operators  | Seay Law International, PA  | November 2013  | Completed - Published as Legal Research Digest 24 |               |
| 05-03 | The Fourth Amendment and Airports  | Jodi Howick                 | August 2014    | Completed - Published as Legal Research Digest 27 |               |
| 05-04 | A Guide for Compliance with Grant Agreement Obligations to Provide Reasonable Access to an APF-Funded Public Use General Aviation Airport  | Kaplan Kirsch Rockwell, LLP | July 2013      | Completed - Published as Legal Research Digest 23 |               |
| 06-01 | Operational and Legal Issues with Fuel Farms   | Kaplan Kirsch Rockwell, LLP | September 2014 | Completed - Published as Legal Research Digest 28 |               |
| 06-02 | Contract Risk Management for Airport Agreements  | Broad & Cassell             | May 2015       | Completed - Published as Legal Research Digest 30 |               |
| 07-01 | Impact of Firearms Laws on Airports  | The Thomas Law Firm         | March 2015     | Completed - Published as Legal Research Digest 29 |               |
| 07-02 | Preemption of Worker Retention and Labor Peace Agreements at Airports  | Kaplan Kirsch Rockwell, LLP | October 2015   | Completed - Published as Legal Research Digest 31 |               |
| 08-01 | Legal Issues Related to the Implementation and Operation of Safety Management Systems for Airports   | Kaplan Kirsch Rockwell, LLP | June 2018      | Completed - Published as Legal Research Digest 36 |               |
| 08-02 | Legal Risks of Operating a Public Airport  | Jodi Howick                 | May 2016       | Completed - Published as Legal Research Digest 33 |               |
| 08-03 | Evolving Law on Airport Implications by Unmanned Aerial Systems Operations   | Ravich Law Firm, P.A.       | May 2016       | Completed - Published as Legal Research Digest 32 |               |

| No.   | Title   | Consultant                      | Start Date     | Estimated Completion Date                         | Staff Officer  |
|-------|---|---------------------------------|----------------|---|----------------|
| 08-04 | Legal Consideration in the Funding and Development of Multi-Modal Facilities                  | Timothy Karaskiewicz            | May 2016       | Completed - Published as Legal Research Digest 35 |                |
| 09-01 | Airport Public Health Preparedness & Response: Legal Rights, Powers & Duties                  | University of Arizona           | February 2017  | Completed - Published as Legal Research Digest 34 |                |
| 09-02 | Legal Issues Relating to Airports Promoting Competition                                       | Kaplan Kirsch Rockwell, LLP     | February 2017  | Completed- Published as Legal Research Digest 37  |                |
| 09-03 | Permitted Airport Involvement in Economic Development Efforts                                 | William J. Estes                | April 2017     | Completed   | M. Greenberger |
| 10-01 | Update of Compilation of FAA/DOT Airport Legal Determinations                                 | Ravich Law Firm, PA             | April 2018     | Research in Progress                              | M. Greenberger |
| 10-02 | Legal Issues Relating to Large Scale Airport Construction Projects                            | University of Nevada, Las Vegas | October 2017   | Completed - Publication Pending                   | M. Greenberger |
| 10-03 | Legal Issues Relating to Airport Commercial Contracts   | Leftwich                        | June 2018      | Research in Progress                              | T. Schatz      |
| 10-04 | Updated Survey of Laws and Regulations Applicable to Airport Commercial Ground Transportation | Carlos Sun                      | November 2018  | Research in Progress                              | T. Schatz      |
| 11-01 | Permissible Uses of Airport Revenue and Property  | Kaplan Kirsch, Rockwell, LLP    | September 2018 | Research in Progress                              | T. Schatz      |
| 11-02 | Accommodation of Federal Agencies Rights and Obligations of Host Airports                     |                                 |                | Terminated  |                |
| 11-03 | Analysis of Laws, Regulations, and Case Laws Regarding Airport Customer Facility Charges      |                                 |                | In Development                                    | T. Schatz      |
| 12-01 | Legal Implications of Data Collection at Airports   |                                 |                | In Development                                    | T. Schatz      |
| 12-02 | Developing Lease Terms for New General Aviation Development                                   |                                 |                | In Development                                    | T. Schatz      |

### **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 University 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             | Transportation Research Board                  | 2/15/2007  | 9/15/2007  | Completed - Workshop Held - Published as TRB Conference Proceedings 41     |               |
| Task 07 | Current and Emerging Issues Facing the Airport Industry                                      | Transportation Research Board                  | 8/1/2007   | 1/31/2009  | Completed - Published as Research Results Digest 5                         |               |
| Task 08 | Enhanced Modeling of Aircraft Taxiway Noise - Scoping  | Wyle Laboratories, Inc.                        | 2/14/2008  | 8/31/2009  | Completed - Published as Web-Only Document 9, Volume 1                     |               |
| Task 09 | Visibility of Airfield Signs and Markings from Aircraft and Ground Vehicles                  |  |            |            | Canceled   |               |
| 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, A4A                                   |               |
| Task 11 | A Summary of How Proposed Firefighting Standards Would Impact Airports                       | GRA, Inc.                                      | 12/23/2008 | 6/15/2009  | Completed - Published as Web-Only 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                | Transportation Research Board                  |            |            | Completed - Symposium Held - Published as TRB Conference Proceedings 47    |               |

| 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 Airport Consultants                  | 1/19/2010  | 11/18/2010 | Completed - Published as Report 58                    |               |
| Task 16 | Analysis, Scoping, and Prioritizing ACRP Deicing Problem Statements                      |  |            |            | Canceled  |               |
| 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  |  |            |            | Canceled  |               |
| Task 20 | Developing Problem Statements on Information Technology Issues at Airports               | Transportation Research Board              | 12/1/2011  | 12/1/2011  | Completed - Workshop Held - Results to AOC            |               |
| Task 21 | Innovative Airport Response to Threatened and Endangered Species                         | Environmental Science Associates           | 4/22/2013  | 8/29/2014  | Completed - Published as Report 122                   |               |
| Task 22 | Best Practices for General Aviation Aircraft Fuel-Tank Sampling                          | Hagerty Environmental LLC                  | 8/14/2013  | 4/13/2014  | Completed - Published as Research Results Digest 21   |               |
| Task 23 | Alternative IT Delivery Methods and Best Practices for Small Airports                    | Barich, Inc.                               | 8/5/2013   | 7/31/2014  | Completed - Published as Report 128                   |               |
| Task 24 | ACRP Electronic Product Options  | Grafton Technologies, Inc.                 | 7/27/2015  | 1/26/2016  | Completed - Final deliverables available for download |               |
| Task 25 | Developing Environmental Problem Statements  | Harris Miller Miller & Hanson, Inc.        | 9/12/2014  | 4/23/2015  | Completed   |               |
| Task 26 | AOC Strategic Planning   | Ricondo & Associates                       | 9/12/2014  | 8/24/2015  | Completed   |               |
| Task 27 | Update to Models for Risk Assessment of Runway Safety Areas                              | Airport Safety Management Consultants, LLC | 11/1/2016  | 3/15/2017  | Completed - Published on website                      |               |

| No.     | Title  | Contractor                         | Start Date | End Date   | Status                          | Staff Officer  |
|---------|--|------------------------------------|------------|------------|---------------------------------|----------------|
| Task 28 | Recovering International Recyclables from In-Flight Service    | GeneraCycle, Inc.                  | 6/16/2017  | 2/28/2019  | Completed - Publication Pending | J. Navarrete   |
| Task 29 | ACRP Research Roadmap on Airport Operations and Maintenance    | Harris Miller Miller & Hanson Inc. | 7/17/2017  | 7/16/2018  | Completed - Published Roadmap   |                |
| Task 30 | ACRP Research Roadmap on Airport Design & Construction         | Harris Miller Miller & Hanson Inc. | 7/6/2017   | 12/25/2019 | Completed - Publication Pending | J. Navarrete   |
| Task 31 | ACRP Oversight Committee Workshop on Emerging Issues           |                                    | 1/1/2018   | 9/30/2018  | Completed - Publication Pending | M. Greenberger |
| Task 32 | ACRP Research Roadmap on Environmental Issues                  | Harris Miller Miller & Hanson Inc. | 5/9/2018   | 11/29/2019 | Research in Progress            | J. Navarrete   |
| Task 33 | ACRP Research Roadmap on Policy and Planning Issues            | Steer Davies & Gleave              | 2/12/2017  | 3/31/2019  | Completed - Publication Pending | T. Schatz      |
| Task 34 | Business Process Review for TRB's Cooperative Research Program |                                    |            |            | Completed                       |                |
| Task 35 | Research Roadmap on Administration and Human Resources Issues  | ICF Incorporated                   | 4/2/2019   | 4/1/2020   | Research in Progress            | J. Navarrete   |
| Task 36 | Research Roadmap on Safety Issues                              | Futron Aviation                    | 5/1/2019   | 4/30/2020  | Research in Progress            | T. Schatz      |
| Task 37 | Periodic Report on Transformative Technology for Airports      | Bairich, Inc.                      |            |            | Research in Progress            | M. Greenberger |

## Synthesis of Information Related to Airport Practices

| No.                       | Title   | Topic Consultant                | Start Date    | Status                                | FAA Liaisons | Staff Officer |
|---------------------------|---|---------------------------------|---------------|---------------------------------------|--------------|---------------|
| <b>01: Administration</b> |   |                                 |               |                                       |              |               |
| SO1-01                    | Innovative Finance and Alternative Sources of Revenue for Airports              | Jacobs Consultancy              | July 2006     | Completed - Published as Synthesis 1  |              |               |
| SO1-02                    | Airport Revenue Diversification   | KRAMER aerotek, Inc.            | March 2009    | Completed - Published as Synthesis 19 |              |               |
| SO1-03                    | Airport Insurance Coverage and Risk Management Practices                        | Ron Rakich & Assoc.             | April 2010    | Completed - Published as Synthesis 30 |              |               |
| SO1-04                    | Airline and Airline-Airport Consortiums to Manage Terminals and Equipment       | AvAirPros                       | April 2010    | Completed - Published as Synthesis 31 |              |               |
| SO1-05                    | Issues with Airport Organization and Reorganization                             | Kim Kenville Consulting         | February 2012 | Completed - Published as Synthesis 40 |              |               |
| SO1-06                    | How Airports Measure Customer Service Performance                               | KRAMER aerotek, Inc.            | February 2012 | Completed - Published as Synthesis 48 |              |               |
| SO1-07                    | Conducting Airport Peer Reviews   | CTC & Associates                | February 2012 | Completed - Published as Synthesis 46 |              |               |
| SO1-08                    | Understanding the Value of Social Media at Airports for Customer Engagement     | Leigh Fisher                    | March 2013    | Completed - Published as Synthesis 56 |              |               |
| SO1-09                    | Practices to Develop Effective Stakeholder Relationships at Smaller Airports    | Delta Airport Consultants, Inc. | May 2014      | Completed - Published as Synthesis 65 |              |               |
| SO1-10                    | Strategies for Maintaining Air Service  | Sixel Consulting Group, Inc.    | May 2014      | Completed - Published as Synthesis 68 |              |               |
| SO1-11                    | Planning for Operational Recovery at Small Airports                             | North Dakota State University   | April 2015    | Completed - Published as Synthesis 78 |              |               |
| SO1-12                    | Airport Participation in Oil & Gas Development                                  | KRAMER aerotek, Inc.            | May 2016      | Completed - Published as Synthesis 87 |              |               |
| SO1-13                    | Food and Beverage and Retail Operators: The Costs of Doing Business at Airports | Unison Consulting, Inc.         | June 2016     | Completed - Published as Synthesis 81 |              |               |

| No.                    | Title   | Topic Consultant                       | Start Date | Status                                | FAA Liaisons   | Staff Officer |
|------------------------|---|--|------------|---------------------------------------|----------------|---------------|
| S01-14                 | Funding Industrial Aviation Development   | Smith-Woolwine Associates, Inc.        | May 2016   | Completed - Published as Synthesis 79 |                |               |
| S01-15                 | Airport Operator Options for Delivery of FBO Services   | KRAMER aerotek, Inc.                   | June 2016  | Completed - Published as Synthesis 86 |                |               |
| S01-16                 | Microgrids and Their Application at Airports  | Arup North America                     | June 2017  | Completed - Published as Synthesis 91 |                |               |
| S01-17                 | Attracting Investment at General Aviation Airports Through Public-Private Partnerships and Leasing    | Texas A&M Transportation Institute     | May 2017   | Completed - Publication Pending       | K. Brockman    | T. Helms      |
| S01-18                 | Value, Benefits, and Limitations of Qualifications Based Selection (QBS) for Airport Project Delivery | Gransberg & Associates                 | June 2018  | Completed - Publication Pending       | M. Rottinghaus | G. Staba      |
| S01-19                 | Data Acquisition and Protocols for Risk Management  | Dubuque-Snyder Aviation Consulting LLP | June 2018  | Completed - Publication Pending       | S. Gardner     | T. Helms      |
| S01-20                 | Compilation of Data on the State of FBOs  | Kramer Aerotek, Inc.                   | June 2018  | Research in Progress                  | C. Carson      | L. Luante     |
| S01-21                 | Benefits of Arts Programs to Airports and Stakeholders  | Tim Karaskiewicz                       | June 2019  | Research in Progress                  | T. Cuddy       | G. Staba      |
| S01-22                 | Last Mile in General Aviation - Courtesy Vehicles and Other Forms of Ground Transportation            | AirportAdmin, LLC                      | June 2019  | Research in Progress                  | W. Reinhardt   | G. Staba      |
| <b>02: Environment</b> |   |  |            |                                       |                |               |
| 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 North America                     | March 2007 | Completed - Published as Synthesis 10 |                |               |
| S02-03                 | Compilation of Noise Programs in Areas Outside DNL 65   | Haris Miller Miller, & Hanson, Inc.    | 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 |                |               |

| No.    | Title  | Topic Consultant                 | Start Date | Status                                | FAA Liaisons | Staff Officer |
|--------|--|----------------------------------|------------|---------------------------------------|--------------|---------------|
| S02-05 | Funding Opportunities for Airport Environmental Projects   | Unison Consulting, Inc.          | April 2010 | Completed - Published as Synthesis 24 |              |               |
| S02-06 | Airport Climate Adaptation and Resilience  | AEA Group                        | April 2011 | Completed - Published as Synthesis 33 |              |               |
| S02-07 | Integrating Environmental Sustainability into Airport Contracts  | Leigh Fisher                     | March 2012 | Completed - Published as Synthesis 42 |              |               |
| S02-08 | Environmental Assessment of Air and High-Speed Rail Corridors  | Arizona State University         | March 2012 | Completed - Published as Synthesis 43 |              |               |
| S02-09 | Environmental Management System Development Process  | First Environment, Inc.          | March 2012 | Completed - Published as Synthesis 44 |              |               |
| S02-10 | Outcomes of Green Initiatives: Large Airport Experience  | First Environment, Inc.          | March 2013 | Completed - Published as Synthesis 53 |              |               |
| S02-11 | Lessons Learned from Airport Sustainability Plans  | A Ripple Effect, PLC             | May 2014   | Completed - Published as Synthesis 66 |              |               |
| S02-12 | Airport Sustainability Practices - Drivers and Outcomes of Green Initiatives for Small and General Aviation Airports | Doprather Airport Solutions, LLC | May 2015   | Completed - Published as Synthesis 69 |              |               |
| S02-13 | Helicopter Noise Information for Airport Noise Managers  | Landrum & Brown                  | May 2015   | Completed - Published as Synthesis 76 |              |               |
| S02-14 | Airport Sustainability Practices   | Haley & Aldrich, Inc.            | March 2015 | Completed - Published as Synthesis 77 |              |               |
| S02-15 | Airport Experience with Alternative Fuels for Ground Transport   | The Cadmus Group, LLC            | June 2016  | Completed - Published as Synthesis 85 |              |               |
| S02-16 | Airport Experience with Implementing Notifications Required by the Aircraft Drinking Water Rule                      | The Cadmus Group, LLC            | April 2016 | Completed - Published as Synthesis 88 |              |               |
| S02-17 | Sustainability's Role in Airport Growth  | The Cadmus Group, LLC            | June 2017  | Completed - Published as Synthesis 93 |              |               |

| No.                            | Title  | Topic Consultant                    | Start Date   | Status                                | FAA Liaisons           | Staff Officer |
|--------------------------------|--|-------------------------------------|--------------|---------------------------------------|------------------------|---------------|
| S02-18                         | Airport Waste Management and Recycling Practices   | Mead & Hunt                         | June 2017    | Completed - Published as Synthesis 92 |                        |               |
| S02-19                         | Clean Vehicles, Fuels, and Practices for Airport Private Ground Transportation Providers | University of South Florida         | June 2017    | Completed - Published as Synthesis 89 |                        |               |
| S02-20                         | Lessons Learned from Airport Greenhouse Gas Reduction Efforts                            | Barrett Energy Resources Group      | June 2018    | Completed - Publication Pending       | P. Magnotta            | G. Staba      |
| S02-21                         | Practices in Airport Renewable Energy Projects   | Barrett Energy Resources Group      | June 2019    | Research in Progress                  | P. Magnotta<br>M. Otey | G. Staba      |
| <b>03: Policy and Planning</b> |  |                                     |              |                                       |                        |               |
| 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      | Economic Development Research Group | April 2008   | Completed - Published as Synthesis 13 |                        |               |
| S03-06                         | Strategies for Reuse of Underutilized or Vacant Airport Facilities                       | KRAMER aerotek, Inc.                | April 2010   | Completed - Published as Synthesis 25 |                        |               |
| S03-07                         | Integrating Airport GIS Data with Public Agency GIS                                      | Grafton Technologies                | March 2013   | Completed - Published as Synthesis 59 |                        |               |
| S03-08                         | Backcountry Airstrip Preservation  | T-O Engineering, Inc.               | March 2013   | Completed - Published as Synthesis 55 |                        |               |
| S03-09                         | Cell Phone Lots at Airports  | KRAMER aerotek, Inc.                | May 2014     | Completed - Published as Synthesis 62 |                        |               |

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| S03-10            | Practices in Preserving and Developing Public-Use Seaplane Bases                             | Stephen Quility                 | May 2014     | Completed - Published as Synthesis 61 |              |               |
| S03-11            | Transportation Network Companies: Challenges and Opportunities for Airport Operators         | InterVISTAS, Inc.               | June 2016    | Completed - Published as Synthesis 84 |              |               |
| S03-12            | Response Considerations for Communicable Diseases on Arriving Flights                        | Smith-Woolwine Associates, Inc. | June 2016    | Completed - Published as Synthesis 83 |              |               |
| S03-13            | Estimating Truck Trip Generation for Airport Air Cargo Activity                              | Resource Systems Group, Inc.    | May 2016     | Completed - Published as Synthesis 80 |              |               |
| S03-14            | Simulation of Airside and Landside Operations in Airport Planning                            | Resource Systems Group, Inc.    | May 2017     | Completed - Publication Pending       | W. Reinhardt | T. Helms      |
| S03-15            | How Airports Plan for Changing Aircraft Capacity- the Effects of Upgauging                   | DY Consultants                  | June 2017    | Completed - Publication Pending       | K. Duffy     | T. Helms      |
| <b>04: Safety</b> |  |                                 |              |                                       |              |               |
| 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 |              |               |
| S04-05            | Bird Repellant Techniques on Airports  | Mississippi State University    | 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, LLC         | April 2011   | Completed - Published as Synthesis 37 |              |               |
| S04-08            | Managing Aerial Firefighting Activities on Airports  | Critical Path International     | May 2011     | Completed - Published as Synthesis 32 |              |               |

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| S04-09 | Model Mutual Aid Agreements for Airports   | Smith-Woolwine Associates, Inc.            | March 2012    | Completed - Published as Synthesis 45 |              |               |
| S04-10 | Safety Reporting Systems at Airports   | Landry Consultants, LLC                    | February 2013 | Completed - Published as Synthesis 58 |              |               |
| S04-11 | Effective Cooperation Among Airports and Local and Regional Emergency Management Agencies for Disaster Preparedness and Response | Smith-Woolwine Associates, Inc.            | February 2013 | Completed - Published as Synthesis 50 |              |               |
| S04-12 | Airport Emergency Post-Event Recovery Practices  | Smith-Woolwine Associates, Inc.            | June 2014     | Completed - Published as Synthesis 60 |              |               |
| S04-13 | Combining Mixed Use Flight Operations Safely at Airports   | SMQ Airport Services                       | May 2015      | Completed - Published as Synthesis 74 |              |               |
| S04-14 | Airport Safety Risk Management Panel Activities and Outcomes   | Airport Safety Management Consultants, LLC | April 2015    | Completed - Published as Synthesis 71 |              |               |
| S04-15 | Flight Operations Advisories at Non-Towered Airports   | Dprather Aviation Solutions, LLC           | May 2015      | Completed - Published as Synthesis 75 |              |               |
| S04-16 | Emergency Communications Planning for Airports   | Smith-Woolwine Associates, Inc.            | May 2015      | Completed - Published as Synthesis 73 |              |               |
| S04-17 | Tabletop and Full-Scale Emergency Exercises for General Aviation, Non-Hub, and Small Airports                                    | Smith-Woolwine Associates, Inc.            | May 2015      | Completed - Published as Synthesis 72 |              |               |
| S04-18 | Uses of Social Media to Inform Operational Response and Recovery During an Airport Emergency                                     | Smith-Woolwine Associates, Inc.            | June 2016     | Completed - Published as Synthesis 82 |              |               |
| S04-19 | Incorporating ADA and Functional Needs in Emergency Exercises  | Smith-Woolwine Associates, Inc.            | May 2017      | Completed - Published as Synthesis 90 |              |               |
| S04-20 | Airport Incident Reporting Practices   | AMQ Airport Services                       |               | Completed - Published as Synthesis 95 |              |               |
| S04-21 | Models for Law Enforcement at Airports   | Hickory Ridge Group LLC                    | February 2019 | Research in Progress                  | T. Helms     |               |

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| S04-22                     | Airport Surface Weather Observation Options for General Aviation Airports      | Delta Airport Consultants, Inc.         | June 2018     | Completed - Publication Pending       | M. Hovan     | T. Helms      |
| S04-23                     | Airport Emergency Working Groups   | Smith-Woolwing Associates, Inc.         | July 2018     | Completed - Published as Synthesis 99 |              |               |
| S04-24                     | Practices in Airport Emergency Plans   | Tidal Basin Government Consulting       | June 2019     | Research in Progress                  | M. Tonnaciff | T. Zwhalen    |
| S04-25                     | Escalator Falls  | Katherine Hunter Zaworski               | June 2019     | Research in Progress                  | R. Didio     | G. Staba      |
| <b>05: Security</b>        |  |   |               |                                       |              |               |
| S05-01                     | Intelligent Transportation System (ITS) Sensor Technology for General Aviation |   | Canceled      |                                       |              |               |
| <b>06: Human Resources</b> |  |   |               |                                       |              |               |
| S06-01                     | Aviation Workforce Development Practices                                       | International Aviation Management Group | March 2009    | Completed - Published as Synthesis 18 |              |               |
| S06-02                     | Airport Self-Inspection Practices and Training Procedures                      | Prather Airport Solutions               | May 2010      | Completed - Published as Synthesis 27 |              |               |
| S06-03                     | Exploring Airport Employee Commuting and Parking Strategies                    | DMR Consulting                          | May 2011      | Completed - Published as Synthesis 36 |              |               |
| S06-04                     | Adapting New Maintenance Hires to the Airport Environment                      | SMQ Airport Services                    | March 2012    | Completed - Published as Synthesis 49 |              |               |
| S06-05                     | Promoting Aviation Career Education in High Schools and Community Colleges     | DPrather Aviation Solutions LLC         | May 2018      | Completed - Publication Pending       | W. Reinhardt | T. Helms      |
| S06-06                     | Airport Workforce Programs Supporting Employee Well-being                      | ICF Incorporated                        | June 2019     | Research in Progress                  | G. Staba     |               |
| <b>07: Design</b>          |  |   |               |                                       |              |               |
| S07-01                     | Impacts of Aging Travelers on Airports   | Corgan Associates, Inc.                 | February 2013 | Completed - Published as Synthesis 51 |              |               |

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| S07-02                  | Communication Strategies for Airport Passenger Access and Mobility      | Indiana University               | June 2018     | Completed - Publication Pending       | V.Balgobin<br>M. DiPilato | G. Staba      |
| <b>08: Construction</b> |   |                                  |               |                                       |                           |               |
| S08-01                  | Airport Terminal Facility Activation Techniques                         | Arup                             | March 2009    | Completed - Published as Synthesis 20 |                           |               |
| <b>09: Maintenance</b>  |   |                                  |               |                                       |                           |               |
| 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      | Completed - Published as Synthesis 34 |                           |               |
| S09-04                  | Issues with Use of Airfield LED Light Fixtures                          | Rensselaer Polytechnic Institute | May 2011      | Completed - Published as Synthesis 35 |                           |               |
| S09-05                  | Repairing and Maintaining Airport Parking Structures While in Use       | Walker Parking Consultants       | February 2012 | Completed - Published as Synthesis 47 |                           |               |
| S09-06                  | Airside Snow Removal Practices for Small Airports with Limited Budgets  | Stephan Quility                  | June 2014     | Completed - Published as Synthesis 67 |                           |               |
| S09-07                  | Building Information Modeling for Airports                              | Arbor Services                   | May 2015      | Completed - Published as Synthesis 70 |                           |               |
| S09-08                  | Approaches to Mitigate Alkali Silica Reaction (ASR) Effects at Airports | Applied Pavement Technologies    | June 2019     | Completed - Publication Pending       | G. Kline                  | T. Helms      |
| <b>10: Operations</b>   |   |                                  |               |                                       |                           |               |
| 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                         | Bairich, Inc.                    | March 2007    | Completed - Published as Synthesis 8  |                           |               |

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| 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, Inc.                        | March 2009    | Completed - Published as Synthesis 21 |              |               |
| S10-05 | Ramp Safety Practices  | Landry Consultants, LLC                                    | May 2010      | Completed - Published as Synthesis 29 |              |               |
| S10-06 | Investigating Safety Impacts of Energy Technologies on Airports and Aviation | Harris Miller Miller & Hanson, Inc.                        | May 2010      | Completed - Published as Synthesis 28 |              |               |
| S10-07 | Expediting Aircraft Recovery at Airports                                     | Prather Airport Solutions                                  | May 2011      | Completed - Published as Synthesis 38 |              |               |
| S10-08 | Conducting Aeronautical Special Events at Airports                           | Prather Airport Solutions                                  | February 2012 | Completed - Published as Synthesis 41 |              |               |
| S10-09 | Airport Wildlife Population Management                                       | Savannah River Ecological Laboratory                       | February 2012 | Completed - Published as Synthesis 39 |              |               |
| S10-10 | Habitat Management to Deter Wildlife at Airports                             | Mississippi State University                               | March 2013    | Completed - Published as Synthesis 52 |              |               |
| S10-11 | Electric Vehicle Charging Stations at Airport Parking Facilities             | Leigh Fisher   | March 2013    | Completed - Published as Synthesis 54 |              |               |
| S10-12 | Airport Response to Special Events   | KRAMER aerotek, Inc.                                       | February 2013 | Completed - Published as Synthesis 57 |              |               |
| S10-13 | Overview of Airport Fueling System Operations                                | Stephan Quilty   | May 2014      | Completed - Published as Synthesis 63 |              |               |
| S10-14 | Issues Related to Accommodating Animals Traveling through Airports           | Smith-Woolwine Associates, Inc.                            | May 2014      | Completed - Published as Synthesis 64 |              |               |
| S10-15 | Evaluating Airport Performance with the Integration of UAS                   | Dprather Aviation Solutions LLC                            | June 2018     | Completed - Publication Pending       | J.Patterson  | T. Helms      |

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| S10-16 | Airport Operations Training at Small Airports | Dprather Aviation Solutions, LLC | June 2019  | Research in Progress | D. Williams  | T. Zwahlen    |



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