Announcement of Airport Research Projects
August 2024

The Airport Cooperative Research Program (ACRP) is a contract research program with the objective of developing near-term, practical solutions to problems facing airport-operating agencies. The ACRP is sponsored by the Federal Aviation Administration (FAA) and managed by the National Academies of Sciences, Engineering, and Medicine, through the Transportation Research Board. Program oversight and governance are provided by representatives of airport operating agencies and others appointed to the ACRP Oversight Committee (AOC) by the Secretary of Transportation.

The ACRP undertakes research and other technical activities in response to the needs of airport operators on issues involving administration, construction, design, environment, human resources, legal, maintenance, operations, planning, policy, and safety at airports.

The AOC met on July 17 & 18 to select projects for the Fiscal Year 2025 program. This announcement provides background information and a general research objective for each project.

The ACRP is now seeking nominations for serving on project panels. These panels will develop requests for proposals, select contractors, and review draft deliverables prepared by the contractors. Nominations, including self-nominations, may be submitted through MyTRB, which requires registration.

The deadline for nominations is September 20, 2024, but it is **strongly recommended that you submit your nominations as soon as possible.**

Requests for proposals are expected to be released starting in November 2024 and will be available only on the World Wide Web. Each proposal will also be announced by e-mail. To be notified of RFP's that have been posted and other ACRP news, send an email to LISTSERV@LSW.NAS.EDU and type: SUBSCRIBE ACRP_ANNOUNCE in the body of the email. Any research agency is eligible to submit a proposal; guidance for proposal preparation is provided in the brochure, *Information and Instructions for Preparing Proposals*, available at the website referenced above.

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Airport Cooperative Research Program
Fiscal Year 2025 Projects

Project. No.	Title	Amount	Pg.
01-57	Update *ACRP Research Report 215: Transportation Network Companies (TNCs): Impacts to Airport*	$450,000	2
01-58	Airport Enterprise Asset Management and Development of an Asset Registry	$350,000	2
01-59	Airport Landside Congestion Pricing Programs	$500,000	2
02-105	Addressing Challenges to Airport Terminal Recycling	$450,000	3
02-106	Update *ACRP Report 84: Guidebook for Preparing Airport Emissions Inventories for State*	$300,000	3
03-78	Primer for Helping Airports Prepare for the Electrification of Rent-a-Car Fleets	$400,000	3
03-79	IOT Ecosystem as It Applies to the Airports	$450,000	4
03-80	Guide for Developing Airport Air Cargo System Plans	$425,000	4
04-35	Safety Criteria for Use of Autonomous Service Vehicles on Airfields	$350,000	4
06-11	Benefits of Nontraditional Practices to Support the Airport Workforce	$350,000	5
07-28	Incorporating Technological Advancements in Airport Baggage Handling Systems	$400,000	5
08-05	Review and Update of ACRP Airport Design and Construction Products	$500,000	5
10-37	Boarding Passengers with Mobility Issues onto Medium and Large Aircraft Without Loading Bridges	$500,000	5
11-08/(25-01)	Exploring the Impact of Artificial Intelligence on the Airport Industry	$650,000	6
11-09/Topic 2	ACRP First Look: Understanding Impacts of Tire Anti-degradants 6PPD and 6PPD-Quinone at	$50,000	6
11-12/Task 4	Develop a WebResource to Facilitate Project Teaming on ACRP Projects	$200,000	6

Project 01-57
Update **ACRP Research Report 215: Transportation Network Companies (TNCs): Impacts to Airport Revenues and Operations**

Research Field: Administration
Allocation: $450,000

ACRP Research Report 215: Transportation Network Companies (TNCs): Impacts to Airport Revenues and Operations was published in 2020. The report included information on the impact TNC activity has on airport facilities, operations, and finance, and provided recommended practices for the management of TNC activity. As TNC activity and practice continue to evolve, an update to the report is needed.

The objective of this research is to update *ACRP Research Report 215: Transportation Network Companies (TNCs): Impacts to Airport Revenues and Operations* to reflect the latest trends and practice.

Project 01-58
Airport Enterprise Asset Management and Development of an Asset Registry

Research Field: Administration
Allocation: $350,000

Over the past decade, many airport operators have realized the value of implementing a computerized maintenance management system (CMMS) to increase maintenance efficiency and decision making. Yet many airports are struggling with integrating a CMMS into their organization, not because of technology or product limitations, but because of implementation challenges, including system integration, training, and business process improvement workflows. Over the past few years, airport operators have begun to understand that maintenance management is only one aspect of the asset lifecycle. The implementation of an enterprise approach is necessary to form the building blocks of a digital twin, which will eventually integrate numerous assets and systems to use real-time data to monitor operations. An asset registry is also a key tool, as it will enable tracking and connections across multiple systems (e.g., financial, security, maintenance, lease management, security management systems, building information systems). Airport operators require a guide to help them develop an enterprise asset management system to synchronize multiple operational systems and an associated asset registry for seamless integration and data exchange.

The objective of this research is to develop a guide to help airport operators understand enterprise asset management systems and to provide recommended practices, lessons learned, and a playbook to design and deploy an asset registry.

Project 01-59
Airport Landside Congestion Pricing Programs

Research Field: Administration
Allocation: $500,000

Airport landside congestion has become a pressing issue at many U.S. commercial airports. This congestion affects not only an airport's landside efficiency, but often overall operational efficiency. Conventional strategies for mitigating landside congestion, including parking fees, staffed ground transportation dispatchers, traffic control officers, ground transportation contractual requirements, and time-limited restrictions, appear to offer limited benefit. Congestion pricing, which involves imposing fees on drivers entering the airport premises or certain congested zones (e.g., terminal curbs) may offer a potential solution. While such programs have yet to be implemented at U.S. airports, some have begun exploring their use. Successful implementation of congestion pricing will require a systematic process to gather relevant data, engage stakeholders, and develop recommendations for implementation that ensure equity and meet the long-term objectives of the pricing program.

The objectives of this research are to review congestion pricing measures, examine their feasibility for implementation in an airport setting, and develop guidelines for their implementation in a manner suitable to local airport conditions.

Project 02-105
Addressing Challenges to Airport Terminal Recycling

Research Field: Environment
Allocation: $450,000

To address the impacts of waste management and associated greenhouse gas emissions, U.S. airports and their partners strive to reduce waste generation and increase landfill diversion of materials generated in their passenger terminals. Airport recycling programs are challenged by issues of contamination of recycling streams by non-recyclable items, so the success of these endeavors requires efforts to foster behaviors that result in increased capture and decreased contamination. A key element to this success is addressing barriers to recycling participation by passengers, custodial service providers, concessionaires, and others. Traditional efforts have focused on education, yet the success of these approaches has been limited. A large body of research suggests other methods (e.g., community-based social marketing) may offer more effective results.

The objectives of this research are to assess the current state of airport terminal waste recycling programs and to identify and test recommended strategies to increase recycling of airport terminal waste based on local conditions.

Project 02-106
Update **ACRP Report 84: Guidebook for Preparing Airport Emissions Inventories for State Implementation Plans**

Research Field: Environment
Allocation: $300,000

State Implementation Plans (SIPs) provide estimates of future emissions and include planned control measures and other components that demonstrate how the area will meet the U.S. EPA's National Ambient Air Quality Standards (NAAQS) for criteria pollutants to achieve attainment. In 2013, ACRP published *ACRP Report 84: Guidebook for Preparing Airport Emissions Inventories for State Implementation Plans* to help airports prepare emissions inventories. The U.S. EPA regularly updates the NAAQS and sometimes adjusts threshold criteria. This results in more areas being reclassified with more severe designations. As a result, more airport improvement projects are facing scrutiny. Executive Order 12898 (1994) introduced a new impact category that may require modification of the traditional impact analyses used for criteria pollutants, with different spatial, demographic, and geographic considerations; this was reiterated with Executive Order 14096 (2023). Additionally, since the report's publication, the use of new models and tools has become standard practice for airport emissions inventory development.

The objective of this research is to update *ACRP Report 84: Guidebook for Preparing Airport Emissions Inventories for State Implementation Plans* to reflect the latest in policies and the state of practice.

Project 03-78
Primer for Helping Airports Prepare for the Electrification of Rent-a-Car Fleets

Research Field: Design
Allocation: $400,000

As rent-a-car (RAC) companies introduce electric vehicles into their fleets, airports will need to ensure they can meet their unique electrification requirements. RAC companies are expected to require a mix of Level 2 chargers and direct current fast charging, and their energy demand may vary dramatically throughout the day, across the week, as well as over the year (e.g., holidays and during special events). Airport operators are faced with the challenge of how to effectively meet the future electricity requirements of RACs, manage capacity requests between RAC companies and

other tenants, and integrate this demand into the overall energy management system of the airport.

The objective of this research is to develop a primer and tools to help airport practitioners plan for the needs of rent-a-car providers as they continue to incorporate electric vehicles into their fleets.

Project 03-79
IoT Ecosystem as It Applies to Airports

Research Field: Policy & Planning
Allocation: $450,000

The effective use of the Internet of Things (IoT)—a network of connected devices—in an airport setting can improve passenger experience and airport operations. Optimal implementation can best be accomplished through the correct selection of machines, processes, and events to monitor; real-time collection of data; and a vendor agnostic IoT analytics platform for processing end-to-end workflows. IoT networks may offer benefits in virtually all aspects of the airport, ranging from landside and airside operations, safety and security, and environmental sustainability. Since the publication of *ACRP Research Report 191: A Primer to Prepare for the Connected Airport and the Internet of Things* (2018), significant advancements have been made. New research is needed to provide an updated and comprehensive guide for airport operators on considerations prior to starting or even continuing an IoT deployment.

The objective of this research is to develop a comprehensive guide covering the current state of the IoT ecosystem, technologies, and supporting infrastructure, the benefits and risks, and a strategy for airport deployment. The guide should provide practical ways to get started on a holistic IoT strategy and roadmap, including how to incorporate existing deployments to maximize the benefits to the airport and its stakeholders.

Project 03-80
Guide for Developing Airport Air Cargo System Plans

Research Field: Policy & Planning
Allocation: $425,000

The goal of airport system planning is to promote the efficient use of airport resources in a defined geographic area. This is accomplished through a thorough examination of the performance and interaction of the entire system to understand the interrelationships of the member airports. Developing airports within a framework of a system and understanding of a region's user requirements, socioeconomics, and surface transportation network, may result in a more efficient system. While there has been a long-standing tradition of airport system planning focused on passenger and aircraft activity, airport air cargo system planning has been much less common. Air cargo facilities and activity often occur off airport; there are also airport-to-airport cargo movements undertaken entirely by trucks (and it is often common for some airports to have more truck-to-truck air cargo activity than aircraft air cargo activity). These unique characteristics of aircraft activity, coupled with a lack of reliable data on the types of air cargo movements as well as the cargo's origins and destinations, make airport air cargo system planning challenging.

The objective of this research is to develop a guide to help airport practitioners prepare airport air cargo system plans at both the regional and state levels.

Project 04-35
Safety Criteria for Use of Autonomous Service Vehicles on Airfields

Research Field: Safety
Allocation: $350,000

As airports look to increase efficiencies, lower operation costs, and improve safety, autonomous service vehicles (ASVs) are emerging as a potential solution. Autonomous uncrewed aircraft systems already operate in the airport environment to support security and

safety activities, and the deployment risks have been a focus for FAA. ASVs offer the opportunity for automating many other activities on the airfield, including inspection, security and foreign object debris detection and removal.

The objective of this research is to prepare safety guidelines and criteria for assessing readiness and operation of ASVs on airfields.

Project 06-11
Benefits of Nontraditional Practices to Support the Airport Workforce

Research Field: Human Resources
Allocation: $350,000

Airports, and the businesses operating at their facilities, continue to face challenges in recruiting and retaining skilled workers. Each subset of the overall workforce at airports often has different needs and priorities in terms of hiring, training, and benefits (e.g., childcare, education). One approach to building and supporting the airport workforce is for airports and the businesses operating at their facilities to partner to develop mutually beneficial campus-wide recruitment and training programs. Yet there are limited information and guidance on how to accomplish this partnering, including overcoming an unknown number of challenges to this nontraditional approach.

The objective of this research is to identify innovative programs that support the airport workforce. The research should highlight the challenges of airport workforce recruitment, identify relevant case studies, and address implementation challenges.

Project 07-28
Incorporating Technological Advancements in Airport Baggage Handling Systems

Research Field: Design
Allocation: $400,000

Baggage handling at airports is witnessing a significant transformation driven by technological innovations. It is imperative that airports and stakeholders gain a comprehensive and unbiased understanding of the new systems, software, and methods accompanying this transformation, particularly with respect to their impacts on facility design, infrastructure, and cyber security.

The objective of this research is to provide airport practitioners with a comprehensive description of baggage handling technologies and guidelines for evaluating and incorporating these technologies to meet their unique needs.

Project 08-05
Review and Update of ACRP Airport Design and Construction Products

Research Field: Construction
Allocation: $500,000

To meet a key goal of the ACRP Strategic Plan, the AOC approved and funded the development of a systematic method to identify ACRP research products in need of updating. The resulting method considers ACRP's operational factors, metrics for measuring product use and benefits, industry trends, industry input from subject matter experts, and potential efficiencies to be gained by how products can be updated (e.g., grouping or combining products, or updating sections of reports). To date, the method has been applied to ACRP's research related to the environment, policy and planning, administration, human resources, and operations. ACRP also has many products related to airport design and construction, and some of these probably need updates.

The objectives of this research are to conduct a systematic review of ACRP products related to airport design and construction to identify those products in need of updating and undertake the research needed to update the highest-priority products.

Project 10-37
Boarding Passengers with Mobility Issues onto Medium and Large Aircraft Without Loading Bridges

Research Field: Operations
Allocation: $500,000

There are many U.S. airports with gates that do not have loading bridges. When loading bridges are not available, aircraft must be boarded or deplaned using mobile stairs or ramps from grade level. These means of aircraft access can be challenging, particularly for those with mobility issues. In these situations, some passengers may need to be manually carried up or down boarding stairs. This may lead to a compromise of passenger dignity, let alone an increased risk of injuries for all parties involved. These issues are particularly relevant when accessing medium and large aircraft, which have higher door sills.

The objective of this research is to explore practical solutions (including new concepts) for providing a safe and dignified experience for passengers with mobility issues when boarding medium and large aircraft at gates without loading bridges.

Project 11-08 (25-01)
Exploring the Impact of Artificial Intelligence on the Airport Industry

Research Field: Policy & Planning
Allocation: $650,000

Artificial intelligence (AI) technology and applications are growing exponentially across all industries. For airports, use of AI can result in improved operational efficiencies, more accurate traffic forecasting, and improved system diagnostics. While there is much interest in the possible applications of AI at airports, both the supporting technologies and possible applications are still at a nascent stage. There is much to be learned about the benefits, risks, and limitations—particularly in the areas of cyber and operational security, fact validation, legal issues, and public safety.

The objectives of this research are to prepare an introduction to AI technology; conduct a state-of-the-art assessment of the AI ecosystem and technology; critique the class of tools that use AI technology; assess the benefits, risks, and transformational aspects for airports; and develop a strategic business approach and framework in which to safely integrate AI into the airport setting. Key steps in the effort will include publication of an ACRP First Look report and convening an ACRP Insight Event.

Project 11-09/Topic 2
ACRP First Look: Understanding Impacts of Tire Anti-degradants 6PPD and 6PPD-Quinone at Airports

Research Field: Special Projects
Allocation: $50,000

6PPD and its formation product 6PPD-quinone (6PPD-q) have gained recent attention since being attributed to the mortality of select fish species in North American streams. 6PPD is an anti-degradant added to tires to extent their useful life. However, through the life of the tire, friction causes tire wear particles to be released into the environment, including into the atmosphere and roadways, where they enter bodies of water through surface runoff. While the initial focus has been on impacts from roadways, attention is now turning to airports. The U.S. EPA is developing a testing method for 6PPD-q, and regulations are anticipated in the near term, which could impact management of stormwater and other media at airports. The implications to airports have yet to be fully explored.

The objective of this research is to prepare an ACRP First Look publication that focuses on defining the issue, describes how and why it affects airports, provides regulatory and legal context, frames how the airport industry should be thinking about the topic, and identifies possible next research steps.

Project 11-12/Task 4
Develop an ACRP WebResource to Facilitate Project Teaming on ACRP Proposals

Research Field: Special Projects
Allocation: $200,000

ACRP recognizes the important role that diversity plays in research, including among and within the program's research teams. The Transportation Research Board and ACRP previously developed online tools to connect potential teaming partners interested in submitting proposals in response to requests

for proposals (RFPs). For various reasons, these tools are no longer available, yet the need for a tool to encourage and facilitate teaming diversity is increasingly important. Over the last several years, the Cooperative Research Programs have created WebResources as a means of providing project-related websites, and WebResources could also serve as a platform for real-time teaming development opportunities.

The objective of this research is to develop a web-based program using the CRP WebResource platform to provide an opportunity for disadvantaged business enterprises (DBEs), small businesses, and prime contractors to find potential teaming partners in response to RFPs.

Note: This project is not accepting panel nominations. RFP is expected to be posted in September.