

Announcement of Airport Research Projects August 2019

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 25-26, 2019 and selected projects for the Fiscal Year 2020 program. This announcement contains excerpts from original problem statements, along with elements and descriptions derived from scoping guidance from the AOC.

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 [MyACRP until September 23, 2019](#).

Requests for proposals are expected to be released starting in the fall 2019 and will be available only on the World Wide Web. Each proposal will be announced by e-mail. Instructions to register for e-mail notification of requests for proposals is available at <http://www.trb.org/acrp>. 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
Projects in the Fiscal Year 2020 Program**

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Nominations will be accepted until September 23, 2019 at [MyACRP](#)

Project numbers are hyperlinked to that project's webpage on www.TRB.org/ACRP

Summary of Approved Research Projects

■ Project 01-44

Airport Insurance Requirements

Research Field: Administration
Allocation: \$300,000

Airports have diverse insurance requirements for themselves and for those with whom they do business, including contractors, airlines, concessionaires, and other tenants. These diverse insurance needs require airports to address numerous issues, such as identifying legal risks that should be insured against, determining appropriate types and limits of coverage, and balancing protecting the airport with being fair and reasonable with contracted parties. Airports would benefit from guidance on these and related issues, such as coordinating with counsel, handling client confidentiality, and managing public perception when claims arise.

The objective of this research is to develop a guidebook that airport staff can use to set policy with respect to insurance requirements.

■ Project 01-45

Updated Guidebook for Airport Project Delivery Systems

Research Field: Administrative
Allocation: \$450,000

ACRP Report 21: A Guidebook for Selecting Airport Capital Project Delivery Methods was published in 2009. Since that time, delivery methods once considered to be alternative methods, such as construction management at risk and design-build, are now regularly used, while new hybrid methods, such as integrated project delivery and progressive design-build, have emerged. Interest in using new delivery methods has increased as the aviation community has seen them successfully employed at several major airports. The changing landscape of delivery options and the intersection of these methods with an evolving group of project owners (e.g., airports, airlines,

other third parties, and public-private partnerships) have created a need for updated guidance on how airports, key stakeholders, their consultants, and their contractors can assess the suitability of various delivery methods for their capital projects.

The objective of this research is to update ACRP Report 21: A Guidebook for Selecting Airport Capital Project Delivery Methods to include guidance for project delivery methods that have emerged since its publication in 2009.

■ Project 01-46

Geospatial Data Governance—Organization Factors and Best Practices for Airports

Research Field: Administration
Allocation: \$450,000

As airports' use of software systems and applications that use geospatial data (e.g., GIS/CAD/BIM) has increased, airports have often struggled with feeding those systems timely, accurate, and complete data. Various entities use disparate applications and data sources, and priorities and missions vary. Often, data are locked up within various division silos, and are not well maintained. Compounding these challenges is the lack of holistic, organized, and systematic methods for ensuring quality data and timely dissemination to meet an airport's needs. Airports would benefit from research to identify ways of building cross-organizational relationships, defining roles and responsibilities, and establishing policies and procedures.

The objective of this research is to develop a guidebook that provides best practices for geospatial data governance throughout and across an airport organization, including submittal standards, roles and responsibilities, data sharing protocols, data development and maintenance workflows, and engagement of stakeholders—both internal and external to the airport.

Project 01-47

Guide to Airport Innovation—Creating an Organizational Fit for the Future

Research Field: Administration
Allocation: \$300,000

Adjusting to and planning for the ever-changing airport environment is increasingly difficult. To respond to this environment, airports need new and innovative products, services and strategies. Significant recent trends include the connected traveler, the airport cities phenomenon, the use of big data in airport business models, and evolving paradigms in airport concessions and retail. These and other trends often require changes to an airport’s organizational structure and ways of doing business. Yet the gap between those airports that have incorporated innovation into their culture and those that have not appears to be growing. Many factors, ranging from institutional issues to lack of guidance, may inhibit airports from embracing a culture of innovation. Airports need a way to understand innovation as a critical component to achieving their overall vision and goals, and they need guidance on creating an organization that can quickly respond to and incorporate new societal and airport trends.

The objective of this research is to produce a guidebook or playbook for encouraging and sustaining a culture of innovation within an airport’s organization.

Project 01-48

Assessing the Effectiveness of Airport Services and Programs for Passengers with Disabilities

Research Field: Administration
Allocation: \$500,000

ACRP has undertaken several syntheses and research projects to identify and study ways airports provide assistance to passengers with disabilities and aging travelers as they navigate through airports and use airport services. To date, airports have depended primarily on anecdotal evidence, such as the lack of customer complaints and limited feedback, to gauge the

success of these services and programs. Considering the significance of these initiatives from both a customer service and a resource perspective, airports need better ways of measuring their effectiveness; however, such methods have not been developed for an airport setting. Research is needed to provide assess the state of the practice of these services and programs overall, and to assist airports’ decision making and implementation of services and programs to meet their unique situation.

The objective of this research is to prepare guidance to help airports develop, monitor, and assess programs for maximizing the travel experience of customers with disabilities. The guidebook should include the benefits and costs of each program, and recommendations on how to implement best practices.

Project 02-89

Industry Survey—Benefits and Costs for Airport Noise and Operations Monitoring Systems

Research Field: Environment
Allocation: \$250,000

Airports use noise and operations monitoring systems (NOMS) to collect flight track and aircraft identification, noise measurements, weather, and other pertinent data. These systems also can be used to provide nearby communities with requested information about aircraft activity and noise in their vicinity. In the United States, some airports have acquired these systems; however, for several reasons, many airports have not, even though local pressure may exist for them to do so. Research is needed to help airports decide if appropriate NOMS exist for their situation, evaluate the pros and cons of acquiring such systems, and determine the general resources needed to acquire, operate, and maintain these systems.

The objective of this research is to provide airports that are considering the acquisition of a NOMS with guidance based on current industry knowledge about the benefits and costs of such systems.

Project 03-52

Airport Common Use Program Development Guidebook

Research Field: Policy and Planning
Allocation: \$400,000

Airport operators are increasingly focused on improving passenger experience, yet their efforts to address a specific issue often are done in an ad-hoc manner. At many airports, the common use solutions currently in place may not be able to deliver the desired functionality, thereby limiting the airport operator's ability to provide the needed level of customer service to its airlines and passengers. ACRP Report 30: Reference Guide on Understanding Common Use at Airports (published in 2010) focused on assisting airports and airlines in understanding and evaluating the business case for integrating common use into their operations. Since that time, however, both the technological solutions and the implementation strategies have changed significantly. For example, a greater focus is now placed making the passenger journey "seamless," providing new common use options, introducing technology innovations, and adapting to new business models.

The objective of this research is to produce a guidebook for airport common use program development to assist airport operators in the creation of strategic approaches to developing and managing a common use environment.

Project 03-53

Development of Baggage Handling System Decision Making Framework Based on Total Cost of Ownership

Research Field: Policy and Planning
Allocation: \$340,000

Airports across the United States take a wide range of approaches to designing and building baggage handling systems. Most systems are designed and built with a focus on minimizing capital costs, without much consideration given to the future costs of performance, operations, and maintenance. Research is needed to provide

an improved framework for considering future and indirect costs when planning and evaluating options for baggage handling systems. The improved framework should include airport stakeholder engagement and management, financial modeling methods to capture the total cost of system ownership, and benchmarking recommendations. The guidance will aid in increasing the transparency of baggage handling system decisions.

The objective of this research is to develop a decision-making handbook for airport stakeholders for procuring a baggage handling system based on total cost of ownership.

Project 03-54

General Aviation Airports Runway Length Analysis

Research Field: Policy and Planning
Allocation: \$300,000

One of the most important operational characteristics of an airport is the length of its longest runway, as this is a key factor in determining the types of aircraft that can use the airport and whether or not these aircraft can operate at their maximum capabilities. Runway length is also important from a cost perspective, because, in general, the longer the runway, the greater the cost to maintain it. Runway length requirements often are difficult to determine for general aviation (GA) aircraft, due to limited and outdated guidance. For example, FAA Advisory Circular 150/5325-4B has not been updated in nearly 15 years and only provides runway length charts for families of common GA aircraft.

The objective of this research is to develop guidance to help practitioners calculate runway length requirements for airports serving GA aircraft, focusing on the fleet with maximum takeoff weights of 12,500 pounds or less.

Project 03-55

Airport Biometrics—A Primer

Research Field: Policy and Planning
Allocation: \$250,000

Biometrics offer a safe and rapid means of identification. Increasingly, both government agencies (e.g., TSA and CBP) and the private sector (e.g., CLEAR® and various airlines) are employing biometrics at airports, and airports themselves are considering their use. Yet biometric technology and practices are complex, multi-faceted, and quickly evolving. The use of biometrics includes technical, financial, legal, and programmatic considerations, among others. As airports see greater use of biometrics, and as they consider employing the technology for themselves, research is needed to produce a primer to help airports understand the uses and considerations of biometric technology in an airport setting.

The objective of this research is to develop a primer describing the use and implications of biometric technology at airports.

Project 03-56

Airside Planning, Design, and Operations: Electronic Resource Library

Research Field: Policy and Planning
Allocation: \$300,000

The technical documentation on airside planning, design, and operations is vast and includes federal and state regulations and guidance, ACRP and non-ACRP research, publications from international civil aviation entities, association handbooks, as well as codes and standards. These resources provide valuable benefits to airport industry practitioners who design and operate airside facilities, but some of these references are either not well known or often are not easily accessible. An online library of these resources, similar to other recently produced ACRP WebResources, would provide the airport community with the means to access this needed information quickly.

The objective of this research is to create a searchable electronic resource library of documents related to airside planning, design, and operations for airport industry practitioners.

Project 03-57

Understanding Coming Improvements and Transformations in Wireless Connectivity: Concepts for Smarter Airports

Research Field: Policy and Planning
Allocation: \$400,000

Wireless connectivity and service-oriented architectures (SOA) can provide a wide range of capabilities and benefits for airport operators and users. Airport staff and stakeholders, including passengers, pilots, and service providers, stand to benefit from advancements in air-to-ground, air-to-air, within vehicle, and SatCom-based WiFi services. As these wireless technologies advance, these services will migrate from 4G to 5G networks or other platforms, calling for new connectivity and internet-of-things (IoT) guidance for airports.

The objective of this research is to provide airport- and aviation-specific information that better enables airport industry practitioners to make decisions and investments in wireless service and its capabilities to support their airport's operations and users.

Project 03-58

Measuring the Effect of Changes in Air Service Connectivity on Regional Economic Development

Research Field: Policy and Planning
Allocation: \$500,000

Increasingly, the airport industry and state and regional economic development agencies are recognizing that improving intercity and international connectivity through expanded air service is important to the economies of regions served by commercial airports. This recognition is prompting research to develop measures linking air service connectivity with economic

development to help prioritize efforts to attract new or expanded air service and to justify efforts to retain existing air service in situations where it is threatened. Research undertaken for ACRP Report 132: The Role of U.S. Airports in the National Economy used an analysis of multifactor productivity to examine how improvements in air service connectivity between regions and selected international markets could benefit the U.S. economy. Although ACRP Report 132 established a statistical relationship between the national aviation system and the economy, its scope was limited in terms of the number of years, regions, and industries examined.

The objective of this research is to extend the findings of previous ACRP research to more clearly define the influence of changes in air service connectivity on regional economic development and explore the extent to which changes in air service affect productivity in differing industry sectors. This research will enable analysis of the economic benefits of improved air service connectivity to be tailored to state and regional geographies.

Project 04-24

Airport Contributions to the Study, Investigation, and Interdiction of Human Trafficking

Research Field: Safety
Allocation: \$500,000

Human trafficking is defined as the recruitment, harboring, transportation, provision, or obtaining of a person for labor or services through force, fraud, or coercion for the purpose of involuntary servitude, peonage, debt bondage, or slavery. Human traffickers often use local, state, and national infrastructure and transportation systems, including all types of airports, to undertake this activity. Research shows that there is limited insight and understanding of human trafficking networks, and this lack of information impedes investigation, interdiction, and decision support related to human trafficking by law enforcement agencies. According to members of the anti-

human trafficking community, while several airlines may have trained their flight personnel, airports will have varied ways of addressing reports of suspected instances human trafficking. Close coordination between law enforcement and the aviation sector is important in addressing security in the transportation system in an appropriate and effective manner. Airport personnel can take several actions to gain awareness and supply information for anti-human trafficking efforts, including knowing the signs of human trafficking and collecting actionable information. By supporting the investigation and interdiction of human trafficking that occurs in and around their facilities, airports can improve their security posture, provide for the safety of the traveling public, and help the diverse victims of this under-reported crime.

The objective of this research is to create guidance that provides airport industry practitioners with strategies to help combat human trafficking at airports, including assisting federal, state, and local law enforcement.

Project 07-17

Update ACRP Report 40: Airport Curbside and Terminal Area Roadway Operations

Research Field: Design
Allocation: \$500,000

ACRP Report 40: Airport Curbside and Terminal Area Roadway Operations was published in 2010. Since that time, new and emerging ground access trends (e.g., TNCs, driverless vehicles) have emerged. In addition, ACRP Report 40 focused on data gathering and analysis, and not on planning, modifying, and operating roadways and curbsides to achieve maximum efficiency, safety, security, and customer service. Curbsides must accommodate various modes of access and egress, ranging from single occupant vehicles to large buses. Important security issues also must be considered at terminal curbsides. Given that the cost of adding more curb can be significant (e.g., adding a second level), airports would

benefit from identifying cost-effective best practices for curb management to increase existing capacity.

The objective of this research is to update ACRP Report 40 to reflect the latest best practices and emerging ground access trends. This guidance should help airports address their unique needs (e.g., airport size, curbside geometry, climate) and gain maximum efficiency from the existing facilities so as to delay significant infrastructure improvements.

Project 07-18

Develop Airfield Design Guidelines for Unmanned Aerial Vehicles

Research Field: Design
Allocation: \$400,000

Unmanned aerial vehicle (UAV) activity for civilian purposes continues to grow and expand, as operators use UAVs not only for surveillance, aerial photography, and infrastructure inspection, but also for disaster relief and commercial product delivery. Many UAVs operate in a manner similar to piloted aircraft and therefore need airfield facilities for their safe and efficient operation, yet airfield facility planning guidance specifically tailored to address the unique needs of UAVs is limited.

The objective of this research is to develop airfield design guidance for the unique operational needs of UAVs that consider safety, efficiency, and the range of UAV sizes and configurations.

Project 09-20

Consequences of Delayed Maintenance of Airport Assets

Research Field: Maintenance
Allocation: \$300,000

Airport owners are becoming more sophisticated in developing detailed asset management programs to help improve and extend the lifecycle of their facilities. At many airports, however, asset maintenance needs can

still far exceed the budgetary resources available. Airports need a process to help them make financial decisions that consider the impacts from delayed maintenance and express these impacts in terms of asset condition and long-term costs to owners and airport users/stakeholders.

The objective of this research is to develop a process for quantifying the consequences of delaying maintenance on airport assets. The process should cover asset preservation policies, maintenance and budget needs, and should include analyses of delayed maintenance scenarios.

Project 10-28

Guide for Integrating Crisis Management and Business Continuity at Airports

Research Field: Operations
Allocation: \$500,000

A strong relationship between crisis management and business continuity is critical to a high-performing enterprise-wide risk management strategy for any organization. It is even more important to businesses in the transportation sector that are involved with critical infrastructure, including airports. The transition between crisis management or emergency management activities to business continuity and the continuation of critical business functions during and after serious incidents is an essential capability of mature and resilient airports. As exemplified by a recent power outage at a large international airport, an incident can generate cascading effects on operations, partner airlines, and, ultimately, revenue. It is important for airports to develop strong business resilience programs by collecting and sharing best practices on this topic, that are based on industry expertise.

The objective of this research is to develop best practices for integrating crisis management and business continuity at airports based on an assessment of the current state of all-hazards crisis management and its relationship to

business continuity and business resilience for airports across the United States.

Project 10-29

Development of Predictive Model for Jet Blast Exposure

Research Field: Operations
Allocation: \$450,000

Airport design standards do not include specifications or guidance related to jet blast hazards, except for the risk of erosion on areas surrounding the runway and the aerodynamic effects that can be created by an aircraft taxiing on a bridge. Yet jet blast also poses risks to infrastructure, equipment, and persons in other movement and nonmovement areas. This risk is of particular concern in apron areas where aircraft are operating in proximity to vehicles, equipment, employees, and passengers. Incorporating jet blast risk assessment in the design and layout of these areas would enhance safety, but the available literature and data on jet blast exposure are limited, and little guidance has been developed on jet blast hazard assessment.

The objective of this research is to develop a predictive model and electronic tool to help practitioners estimate jet blast exposure of non-movement areas based on local parameters (e.g., taxiway centerline, slope, type of aircraft, operating conditions). Given the limited data currently available, a field measurement campaign may also be required as an additional objective.