ACRP REPORTS ON THE STATE OF THE PRACTICE

INTRODUCTION

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

A careful review of existing ACRP reports was conducted to best gauge the state of the practice in regional air system planning. The following ACRP reports primarily concern ground access to airports, which is the focus of this RASP.

AIRPORT SYSTEM PLANNING PRACTICES (2009)

TRB's ACRP Synthesis 14: Airport System Planning Practices explores the extent to which state aviation agencies and regional planning organizations are involved in airport system planning. The report also examines the type of studies these organizations perform and how successful their efforts have been in meeting the planning process objectives.[1]

The focus of this report is on how airport system plans are now being conducted and used. The synthesis collected information on each of the following:

- General background information, including: the plan's funding source, number of airports analyzed, and ownership of system airports
- Interface of the planning effort with the National Plan of Integrated Airport Systems (NPIAS)
- Coordination and other outreach efforts that characterize the planning process
- Various elements or special studies included in the planning effort
- Ways that plans are being used and implemented

All 50 state aviation directors, as well as the directors from Guam and Puerto Rico, were surveyed to collect information on their current airport system planning practices. This report also presents several case studies that focus on multi-state and metropolitan or regional aviation system plans. This synthesis reports on current airport system planning practices based on survey results, case studies, and a literature review.

Changes in federal funding for airport planning have eliminated the specific allowance for system planning, although the FAA can still allocate funds to system planning activities; resulting in system

[1] National Academies of Sciences, Engineering, and Medicine. 2009. *Airport System Planning Practices*. Washington, DC: The National Academies Press. https://doi.org/10.17226/23041.

planning activities competing against other planning needs, such as airport master plans or even capital improvement projects. The literature review poses the question of whether sufficient funds are being dedicated to planning activities, considering the complexity of the issues and the recognition that it is important that aviation be examined within the broader, multimodal, multi-jurisdictional context.

According to the report, the airport system planning process checks the "reasonableness" of individual airport master plans - including determining whether individual system airports are over or under planning based on demand and constraints at other nearby airports.

Key takeaways from ACRP Synthesis 14 that are most relevant to the RASP Update include:

- 59 percent of respondents involved MPOs in the preparation of their most current state airport system plan – 41 percent did not. 24 percent of participants reported that they have at least one MPO in their state that conducts its own airport system planning efforts.

- Based on survey results, there may be an opportunity by states or MPOs to prolong the useful life of system plans as only 32 percent of states noted that they are undertaking any continuous system planning once their plan is completed.

- 90 percent of survey respondents indicated that their plans include a comprehensive forecasting element; 88 percent of the plans have assigned airports to system roles; 67 percent of the plans considered ground access or intermodal connectivity.

- Only 60 percent of survey participants reported that they use their system plan to make actual funding decisions for development at system airports, while 62 percent indicated that their system plan helps them improve their accountability by showing how their investment improves system performance.

- Based on their objectives for their individual plans, 28 percent of respondents rank their plans as being very effective; 43 percent rank their plans as being effective; while the remaining 30 percent rank their plans as being somewhat effective or not effective.

- 52 percent of respondents indicated that their airport system plans considered, in some way, either aviation demand attraction from neighboring states or demand lost to neighboring states. Only 5 percent of all survey respondents involved their counterparts in neighboring states during the development of their most recent airport system plan.

AIRPORT CURBSIDE AND TERMINAL AREA ROADWAY OPERATIONS (2010)

TRB's ACRP Report 40: Airport Curbside and Terminal Area Roadway Operations, includes guidance on a cohesive approach to analyzing traffic operations on airport curbside and terminal area roadways. The report examines operational performance measures for airport curbside and terminal area roadway operations and reviews methods of estimating those performance measures. The report includes a quick analysis tool for curbside operations and low-speed roadway weaving area, highlights techniques for estimating traffic volumes, and presents common ways of addressing operational problems.[2]

[2] National Academies of Sciences, Engineering, and Medicine. 2010. Airport Curbside and Terminal Area Roadway Operations. Washington, DC: The National Academies Press. https://doi.org/10.17226/14451.

According to Report 40, the main differences between the operating characteristics of airport terminal area access and circulation roadways and non-airport roadways include:

- High proportion of unfamiliar motorists
- Large number of complex directional signs
- Stressful conditions due to upcoming air travel
- High proportion of large vehicles
- Mix of experienced and inexperienced drivers
- Recirculating traffic, which contributes significantly to roadway congestion

To estimate future airport roadway traffic volumes, the traditional four-step approach should be implemented, which involves estimating the trips generated, determining trip distribution, analyzing travel mode choice, and assigning traffic volumes to the on-airport and regional roadway networks. It is worth noting that mode choice analysis here is defined by mode choice patterns of both passengers and employees, whereas the Baltimore-Washington Regional Air Passenger Survey only considers mode choice and general patterns and preferences of departing air passengers.

The report highlights several challenges to estimating roadway traffic volumes, including the lack of data on airline passengers and hourly passenger volumes, the effort needed to gather required data, and the resulting accuracy of the forecast. When acquiring this data is not possible, the growth factor method for estimating future traffic volumes – the ratio between traffic volumes in the current peak hour and in the peak hour to be analyzed – is recommended.

Performance measures for evaluating airport curbside operations include: number of vehicles parked in the second and third lanes; queue length; queue duration; and average vehicle delay. The report recommends the following for more accurately estimating airport curbside roadway traffic volumes:

- Separate estimates of vehicles stopping in a curbside lane and through traffic vehicles
- Separate analyses of the curbside departures and arrivals roadways
- Separate analyses for each class of vehicle
- Separate estimates of traffic volumes for each terminal building or concourse

ACRP Report 40 concludes by identifying the most typical terminal area roadway problems and a detailed set of strategies for resolving each issue (see report), which are generally categorized into physical improvements, operational measures, and airport policies. The key issues highlighted include:

- Insufficient roadway capacity
- Insufficient merging capacity
- Inadequate weaving distance
- Lane imbalance
- Directional information overload
- Insufficient decision-making distance
- Insufficient queuing space
- Unexpected lane drops and inadequate taper lengths
- Unexpected transition from high-speed to low-speed roadway environment

HANDBOOK TO ASSESS THE IMPACTS OF CONSTRAINED PARKING AT AIRPORTS (2010)

TRB's ACRP Report 34: Handbook to Assess the Impacts of Constrained Parking at Airports explores different types of parking constraints that airports experience and highlights tools to assess the impacts of the constraints and strategies to deal with them.[3] The report considers two types of customers when addressing parking strategy: the flying public and employees.

The following objectives for managing constrained airport parking environments were highlighted:

- Financial
- Customer Service
- Traffic Management and Mode-Share
- Environmental
- Land-Use

The report provides strategies for addressing constrained customer parking, separated by ongoing and short-term constraints – as well as strategies to address constrained employee parking:

- Ongoing Constraints
    - Increase parking supply
    - Introduce new parking products
    - Reallocate supply among parking categories
    - Adjust parking rates
    - Introduce technology improvements
    - Promote use of HOV modes

- Short-Term Constraints
    - Provide hands-on management in constrained parking facilities
    - Adjust parking rates on a temporary basis
    - Disseminate public information
    - Provide temporary overflow parking
    - Direct parking customers to private operated parking facilities

- Constrained Employee Parking
    - Increase capacity
    - Consolidate the parking supply
    - Reassign parking facilities
    - Adjust parking rates
    - Offer alternatives to the drive-alone commute

The report concludes with recommendations for data sources and performance measurements to utilize when evaluating the effectiveness of strategies:

- Data Sources
    - Parking revenue control system
    - Supplemental parking data
    - Airline origin and destination (O&D) passenger survey data

[3] National Academies of Sciences, Engineering, and Medicine. 2010. Handbook to Assess the Impacts of Constrained Parking at Airports. Washington, DC: The National Academies Press. https://doi.org/10.17226/14435.

    - Vehicle activity and vehicle occupancy counts
    - Enplaned O&D passenger activity

- Performance Measurements
    - Public parking activity
    - Financial performance
    - Vehicle traffic volume
    - Emissions generated
    - Mode-share distribution
    - Customer service

EXPLORING AIRPORT EMPLOYEE COMMUTE AND PARKING STRATEGIES (2012)

TRB's ACRP Synthesis 36: Exploring Airport Employee Commute and Parking Strategies analyzes what is known about airport employee commute patterns and commute modes. The report addresses alternatives to the drive alone commute for airport employees, the effectiveness and challenges of airport employee commute options programs, and commute options programs offered by non-airport employers that might be applicable to the airport environment.[4]

The report highlights the following strategies and challenges in the provision of airport employee commute options programs:

Strategies

- Incentives
    - Subsidies
    - Provision of vanpools
    - Pre-tax earnings
    - Transportation discounts
    - Parking cash-out
    - Work schedule adjustments like telework, compressed work week, flex time
    - Rewards like cash, paid leave, goods and services, prize drawings

- Supporting strategies
    - Ride-matching services
    - Guaranteed ride home / emergency ride home
    - Preferential parking for carpools and vanpools
    - Transportation for mid-day trips
    - On-site amenities like a childcare facility, gym, dry cleaner
    - Commuting by bicycle

- Disincentives
    - Parking pricing
    - Parking location

[4] National Academies of Sciences, Engineering, and Medicine. 2012. Exploring Airport Employee Commute and Parking Strategies. Washington, DC: The National Academies Press. https://doi.org/10.17226/22724.

- Marketing
    - Printed materials
    - Employee newsletters
    - Orientation materials for new employees
    - Campaigns to encourage ridesharing and other non-SOV commutes
    - Holding events to promote ridesharing, public transportation, walking, biking
    - Website that provides information on alternatives to driving alone to work

- Program management
    - Dedicated staff provided by employer
    - Collective involvement among airport employers
    - Centrally located office where employees may obtain information

- Provision or enhancement of scheduled transportation services
    - Communication
    - Subsidies
    - Initiating new service

Challenges

- Public transportation system
- Employee parking supply
- Employee participation
- Airport employer participation
- Funding
- Availability of data
    - Total airport employees
    - Employee demographics and commute characteristics
    - Employee commute preferences
    - Vehicle trips
    - Parking spaces provided by airport employers
    - Employee commute options programs offered by airport employers

The report concludes with the following key findings:

- Very few U.S. airport operators provide employee commute options (ECO) programs

- The benefits of ECO programs extend beyond satisfying requirements, resulting in shifts to higher-occupancy modes, a reduction in vehicle trips generated by employees and the associated environmental benefits, and enabling employees to choose not to drive alone to work, providing them with more viable options for commuting.

- The airport operator is directly responsible for a small proportion of total airport employees – thus the ECO programs are responsible for a smaller reduction in the average vehicle trips generated by the total airport employee population. No airport operator interviewed was aware of all of the employers based at its airport that offered ECO benefits.

- Airport surveys are conducted at four airports on a regular basis to understand employee commute patterns: Boston Logan International Airport (BOS), London Stansted Airport (STN), Los Angeles International Airport (LAX), and Portland International Airport (PDX).

- The airport operators interviewed were missing the following data that would assist them in furthering their employee commuter options programs: the total number of airport employees (ie: many employees do not have security badges, so the security badge file does not provide the total employee count); the proportion of employees that work within walking distance of the airport terminal area; the number or percentage of vehicle trips generated by the employee population; and the number of employee parking spaces provided by tenants through leases.

COMMERCIAL GROUND TRANSPORTATION AT AIRPORTS: BEST PRACTICES (2015)

TRB's ACRP Report 146: Commercial Ground Transportation at Airports: Best Practices covers best management practices to ensure the provision of safe, comfortable, easy-to-use, and efficient commercial ground transportation service. Commercial ground transportation services include taxicabs, limousines, shared-ride services, transportation network companies, courtesy vehicles, buses, and vans; the guidebook does not address rail transit and public transit access to airports or airport automated people mover systems. The guidebook reviews the ground transportation industry, potential solutions to challenges airport operators frequently face, how to select a solution, and how to implement the selected best practice.[5]

The report provides the following framework for commercial ground transportation goals:
- Enhance the experience of the airport customer
- Minimize required staff time and airport resources
- Support airport and regional environmental and sustainability objectives
- Establish an environment that allows drivers to earn a fair wages and other business owners to receive a reasonable return on their investment
- Recover costs, and to the extent possible, increase revenues consistent with the above goals

The following metrics can be used to evaluate an airport's ground transportation performance:
- Passenger volumes
- Proximity – comparing nearby airports
- Distance to downtown
- Physical configuration or layout
- Business relationship with commercial vehicle operators
- Customer demographics
- Legal and political environment / governance structure
- Financial and staff resources

The report compares the utility and cost of a range of supporting technologies for ground transportation management (GTM), and concludes with recommendations on how airports can best sell and implement proposed solutions to senior airport management and working with key stakeholders, including: the providers and drivers, elected officials and airport boards, local and state regulatory agencies, and the traveling public. Having the problem or need for improvement

[5] National Academies of Sciences, Engineering, and Medicine. 2015. Commercial Ground Transportation at Airports: Best Practices. Washington, DC: The National Academies Press. https://doi.org/10.17226/21905.

documented, the data analyzed, and the recommendations developed are key in implementing any proposed solution. Implementing the solution will entail obtaining budget approval, revising rules and regulations including modifying commercial ground transportation permits or fees, and finally - improving commercial ground transportation facilities – which may likely involve deploying new technologies.

INNOVATIVE REVENUE STRATEGIES – AN AIRPORT GUIDE (2015)

TRB's ACRP Report 121: Innovative Revenue Strategies – An Airport Guide describes a broad range of tools and techniques to improve airport revenue streams, recover costs, and achieve operational efficiencies. The report identifies customer needs; airport-provided services and shared services, facilities, and equipment; revenue participation in real estate and natural resource development; value capture and other financing opportunities; and improvements to existing airport businesses.[6]

To enhance financial strength and resilience, airport operators must develop a clear strategic vision concentrating around the following key areas:

- Increased airport revenues and funding sources
    - Development of real estate, natural resources, and other non-aviation businesses
    - Redesign and enhancement of existing services
    - Value capture and other innovative financing

- Improved performance in all functional areas of the airport
    - From baggage handling and check-in to security, concessions, and overall comfort

- Optimized use of airport assets
    - Shared use facilities, systems, and equipment

- Competitive differentiation from other airports
    - Highlighting key assets, from airline service to transportation infrastructure to concessions, entertainment, and other service or atmosphere-based amenities

- An airport organization that is responsive at all levels
    - A systematic protocol, airport culture, and communications strategy to minimize issues and maximize customer satisfaction

Airports can design new – or refresh existing – concession programs, recruit concessionaires, and manage the program, as one of many means for generating new revenue. The Indianapolis Airport Authority redesigned a new concession program as part of its new Midfield Passenger Terminal building complex. The program emphasized a focus on customer experience, an innovative approach to solicitation of concessions, inclusion of many local businesses at the airport, and a lean management approach to oversee the program.

Value capture and other innovative financing techniques can be implemented to help airports capture value from off-airport businesses that depend on airport activity, including: off-airport parking, rental cars, hotels, and land-lease agreements. Dallas/Fort Worth International Airport's foreign trade zone (FTZ), illustrates how an airport sponsor can leverage its cargo and passenger

[6] National Academies of Sciences, Engineering, and Medicine. 2015. Innovative Revenue Strategies – An Airport Guide. Washington, DC: The National Academies Press. https://doi.org/10.17226/22132.

operations and its standing as a regional economic center to stimulate economic value beyond the airport gate.

The report concludes by reminding readers that today there is no such thing as a simple commercial airport: most airports oversee a complex set of enterprises. While the financial contribution of airlines to airports remains significant, airport operators are seeking additional ways to pay for maintenance, day-to-day operations, and capital projects. For most airports, increasing net revenue to the airport sponsor comes from cost savings, improvements to existing airport businesses, and engagement in new, non-aviation-related activities. To do so, airports must have a vision, develop a strategy, and be nimble in their approach to recognizing opportunities, evaluating risk, and engaging in innovation.

ESTIMATING TRUCK TRIP GENERATION FOR AIRPORT CARGO ACTIVITY (2017)

TRB's ACRP Synthesis 80: Estimating Truck Trip Generation for Airport Air Cargo Activity compiles existing information about air cargo truck trip generation studies. The existing literature and research regarding air cargo facility-related truck trip generation rates is limited in its scope and detail. In addition, the complexity of the modern air cargo industry makes it difficult to obtain the data necessary to develop truck trip generation rates. Access to such information could conceivably help a community plan and invest appropriately by accounting for air cargo's impacts. Similarly, air cargo operators and airport officials could employ such data to help ensure cargo facility truck access and egress remains reliable and safe.[7]

Determinants and complexities of air cargo truck trips include:

- Dynamic cargo types and volumes
- Facility types
- Reduce air cargo capacity and shifts to truck use
- Pace and nature of change in the air cargo industry
- Data sources and access

To date, the interviews conducted indicate that there has been limited interest in understanding the truck trips generated by air cargo facilities, especially on off-airport roadways, to date.
The principal gap remains the lack of availability of current and usable data on air cargo facility-related truck trips. An approach employed by LAX in 2010 employed the "trucks per ton" method using data available through the LAX traffic generation reports and compared the results with actual trip numbers. While this approach may be replicable elsewhere, additional research that compares with any truck trip modeling results would help to evaluate this method for other large airports and determine the most effective approach to utilize.

The report concludes by positing that as the value, volume, and importance of air cargo grows, airports and transportation planners may place more emphasis on truck traffic associated with that growth. Until the information gap is filled to better understand the details of truck trips serving air cargo facilities such as volumes, tonnage, times of day, and types of trucks, it will remain difficult to develop guidance that practitioners and airports can apply with confidence.

[7] National Academies of Sciences, Engineering, and Medicine. 2017. Estimating Truck Trip Generation for Airport Air Cargo Activity. Washington, DC: The National Academies Press. https://doi.org/10.17226/24848.

TRANSPORTATION NETWORK COMPANIES: CHALLENGES AND OPPORTUNITIES FOR AIRPORT OPERATORS (2017)

TRB's ACRP Synthesis 84: Transportation Network Companies: Challenges and Opportunities for Airport Operators compiles experiences and effective practices by airports in facilitating customer access to Transportation Network Companies (TNCs) like Uber and Lyft. This synthesis also summarizes the amount of revenue airports receive from TNCs and how TNCs are affecting airport operations and other businesses.[8]

This report was prepared to address the opportunities and challenges that TNCs introduce to airports and summarizes how airport operators:

- Permit and regulate TNCs
- Locate TNC passenger drop-off and pickup areas and TNC vehicle staging / holding areas
- Establish and enforce regulations concerning TNC drives and vehicles, including penalties
- Establish the fees charged to TNCs and collect and confirm payment of such fees
- Monitor TNC vehicle trips, including the use of geo-fence boundaries and other tools to enforce TNC operations

Key findings include:

- Permits and Regulations
    - Airports rely on the regulations developed by state or other local jurisdictions that establish minimum standards for companies, vehicles, and drivers. Most airports require that in order to drop off and pick up airport passengers, TNCs sign an airport permit indicating the company agrees to abide by airport regulations that supplement those established by the state or local jurisdiction.

- Drop-off and Pickup
    - At most airports (63 percent), TNCs drop off customers at the same location as do private vehicles; the remaining airports require TNCs to drop off passengers at the commercial vehicle boarding area or at the passenger pickup / boarding areas. Of the airports surveyed, 82 percent provided a dedicated staging area: a surface lot (55 percent), an area with a parking structure (20 percent) or an area also used by taxicab, limousine, and other commercial ground transportation drivers (7 percent).

- Airport Regulations Enforcement
    - Most airports (87 percent) rely on curbside traffic officers or airport operations staff to enforce TNC rules and regulations. Police support these traffic officers or are solely responsible for enforcement at nearly half of the responding airports. About 80 percent of the airports surveyed rely on self-reported trip data provided by the TNCs to confirm payment of the correct airport fees.

- Fees Charged to TNCs
    - Most airports – 47 or the 48 surveyed that hold TNC permits – require that TNCs pay at least one of the following fees: annual permit fee (10 airport), per-trip fee (87 percent of airports), activation fee (eight airports), and/or minimum annual guarantee amount (three airports).

[8] National Academies of Sciences, Engineering, and Medicine. 2017. Transportation Network Companies: Challenges and Opportunities for Airport Operators. Washington, DC: The National Academies Press. https://doi.org/10.17226/24867.

- Revenues Received from TNCs
    - The annual revenue airports receive from TNCs depends on the type and amount of the fees the TNCs are required to pay, the number of airport passengers, and the maturity of the market. At almost all airports, the volume of TNC trips has increased during the months that the TNCs have been permitted to operate, with the volume of trips and fees paid expected to increase from those presented in this report. Seven small hub airports received annual revenues of less than $100,000; ten received $100,000 – $1 million; ten received $1 million - $5 million; and four large-hub airports received more than $5 million, with two of them receiving more than $20 million.

- Impact on Airport Operations
    - TNCs have had numerous impacts on airport operations, including: additional responsibilities for airport operations staff; increased curbside or roadway congestion at 46 percent of airports; a 5 to 30 percent decrease in taxicab trips and an 18 to 30 percent decrease in shared-ride van customers; a 10 to 20 percent decline in the use of private vehicles; a 5 to 10 percent decrease in parking revenue; and a 13 percent reduction in rental car transactions.

- Impact on Airport Total Revenues
    - A larger question, which remains unanswered from this report, is whether "new" revenues received from TNCs exceed the foregone revenues an airport would have received if TNCs were not permitted to operate. In particular, any decline in public parking or rental car revenues could adversely affect an airport's finances. A 2016 survey indicated that median gross parking revenue was $63 million for large-hub airports, $23 million for medium-hub airports, and $9 million for small-hub airports. Thus, a 10 percent reduction in these parking revenues would equal or exceed the TNC revenues reported by all but two of the 31 airports included in this study. Those foregone revenues do not include foregone revenues that may result from a change in the use of rental cars, taxicabs, or other transportation services.

CONCLUSION

The report and synthesis documents outlined above will inform the Airports Needs Assessment and Ground Access Forecast conducted in the subsequent second and third phases of the RASP Update. Key takeaways from the documents of greatest relevance to the remainder of the RASP are highlighted below.

- ACRP Synthesis 14: Airport System Planning Practices
    - The outreach efforts for and utilization of the airport system planning practices highlighted in this study will continue to inform the implementation of the RASP.

- ACRP Report 40: Airport Curbside and Terminal Area Roadway Operations
    - The growth factor method for estimating future traffic volumes referenced in this report will help inform the Airports Needs Assessment conducted in RASP Phase 2, as curbside traffic volumes for each airport are not readily available, beyond the data collected in COG-TPB's biennial Regional Air Passenger Survey.

- ACRP Report 34: Handbook to Assess the Impacts of Constrained Parking at Airports
    - Parking capacity – and the revenue generated by parking facilities – are of great importance to the financial health and functional success of the region's three major commercial airports. The strategies for addressing ongoing and short-term parking constraints, as well as the overall employee parking constraint-related challenges, will be of great value to the Airport Needs Assessment in RASP Phase 2. As airports seek to gain further understanding of their existing parking capacity and future needs, the recommended data sources and performance measurements outlined will also be of value.

- ACRP Synthesis 36: Exploring Airport Employee Commute and Parking Strategies
    - The four airport surveys highlighted in this study, along with the data research gaps, strategies, and challenges highlighted will all inform the Airport Needs Assessment of RASP Phase 2 and the Recommendations that RASP Phase 3 will conclude with.

- ACRP Report 146: Commercial Ground Transportation at Airports: Best Practices
    - The framework for commercial ground transportation goals and associated metrics to evaluate airport ground transportation performance will directly inform the framing of the performance-based metrics utilized in the RASP Phase 2 Airports Needs Assessment.

- ACRP Report 121: Innovative Revenue Strategies – An Airport Guide
    - Revenue generation is the cornerstone of every airport's success. In an ever-changing global economy and multimodal world, the landscape for airport revenue generation has changed significantly in recent years. This report underscores the importance of how airports can and must diversify their revenues and funding sources – key recommendations that will be integrated into RASP Phase 3.

- ACRP Synthesis 80: Estimating Truck Trip Generation for Airport Air Cargo Activity
    - This study emphasizes the determinants and complexities of air cargo truck trips, as well as the significant information gathering gap that remains in this field. In addition to informing the Airports Needs Assessment and Ground Access portion of RASP Phases 2 and 3, the findings of this study will be communicated to the three airports to encourage means for expanding their own data collection efforts as it relates to airport cargo activity.

- ACRP Synthesis 84: Transportation Network Companies: Challenges and Opportunities for Airport Operators
    - TNCs have drastically shifted the ground access to and revenue generation of airports throughout the country, including in the Metropolitan Washington region. The findings from this report will be shared in detail with each of the airports and utilized to inform how the Airports Needs Assessment ground access metrics are formulated, and how the Ground Access Forecast is framed.