Operational and Business Continuity Planning for Prolonged Airport Disruptions

DRAFT FINAL REPORT

Prepared for ACRP
Transportation Research Board
of
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Scott Corzine
Risk Solutions International LLC
New York, New York
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AUTHOR ACKNOWLEDGEMENTS

ACRP PROJECT 03-18 PANEL

ABSTRACT

This report documents the results of research into airports' familiarity with and practice of business continuity planning (BCP) during prolonged airport disruptions. It also summarizes the project deliverables – a guidebook introducing airports to business continuity planning and a business continuity software tool that were developed and written as a result of the research. Available literature about BCP in the airport environment was reviewed. A series of airport industry conferences were used to recruit research participants. A business continuity assessment was conducted at a number of airports to identify issues, problems, resources, organization, and funding available at airports for facilitating BCP. It included approximately forty (40) representative airports as well as fixed base operators (FBOs), industry trade groups and associations, labor organizations, federal agencies with operational roles at airports, and the military - to ascertain their perceptions about the practice of BCP by airports. Several airports were selected for a detailed business impact analysis (BIA) that documented the essential business and operational functions that take place at airports. The research supported the premise of the ACRP problem statement: that airports significantly lag comparable peer organizations in their BCP knowledge and practice. These results were used to develop the BCP guidebook and the survey-based software tool, which generates a business continuity plan for each participating airport that is customized to its unique operating environment.

SUMMARY

Project Objectives and Scope

Project Background

Because airports are an integral part of the transportation system and have a major impact on the US economy, prolonged airport disruptions resulting in the loss of critical functions can hamper and degrade service in all segments of the aviation market including commercial air carriers, general aviation, military, and tenants that use the facility.

The problem statement for ACRP 03-18 noted that, while many airports have emergency plans, additional information was needed to develop managerial, operational, and business continuity plans. Research was necessary to develop a guidebook for airport operators to assist them in planning consistently and effectively for continuity during a prolonged disruption. The guidebook and software tool developed in ACRP 03-18 was to complement, rather than duplicate or replace an airport emergency plan.

Project Statement

ACRP 03-18 was created to develop a guidebook for airport operators to plan and prepare for catastrophic events that have the potential for prolonged airport closure causing adverse impacts to the airport, and to the local, regional, and national economy. This guidebook was to incorporate concise guidelines to equip operators of all sizes and types of airports to assess, plan, and prepare for recovery, and had the additional goal of including recommendations for infrastructure, managerial, business and operational sustainability and continuity. The guidebook was to identify industry best practices and develop a critical path framework to identify the immediate and long-term needs in the preparation for catastrophic events.

Initial Project Scope

The ACRP 03-18 research team developed an original project scope plan and timetable that included:

- A review of existing industry literature and practices in business continuity planning (BCP)
- A large data collection effort from a broad sample of representative airports, fixed base operators (FBOs), related agencies and interested organizations, through conferences and targeted interviews

- An interim report identifying current BCP practices, a draft outline of the guidebook, findings and recommendations
- A business impact analysis (BIA) process to develop airport-specific guidelines for operational recovery
- Development of a BCP guidebook that included detailed recovery priorities based on a risk matrix and critical path framework
- Development of a software tool to assist airports in creating a business continuity plan
- This final project report

Scope Refinements

As the team progressed through the research and reported back to the panel, we collectively refined and clarified the original scope:

1. Our essential focus would be on planning for the recovery of core business, operating, and support functions at airports (and not to elements such as airspace interruptions or disruptions to flight operations, which are the responsibility of carriers and the FAA).
2. We addressed those core functions that directly impact airport operating viability, and specifically omitted business continuity planning for service providers such as car rental companies and hotels.
3. We included not only airports, but also airport functions that are the responsibility of FBOs.
4. We included those core departments and functions that are critical to airports' operational viability, as economic entities that must earn a profit or make a defined fiscal contribution to the governmental jurisdiction of which they are a part (rather than solely on their role in aeronautical operations.)
5. We excluded related types of abnormal operations which differ from BCP, such as emergency/crisis management, aviation contingency management, irregular operations, or disaster operations groups (DOGs).
6. We excluded examination of the *causes or specific incidents* that might precipitate long term airport disruptions, because BCP deals with *recovering essential functions regardless of cause*.
7. We confirmed that the scope would exclusively address BCP for domestic airports, and exclude non-domestic facilities.

Key Research Findings

Our research confirmed and amplified the original premise behind ACRP 03-18: that American airports of all sizes have a poor understanding of the scope and benefit of business continuity planning and usually confuse it with emergency management. Some have fairly rudimentary BCP processes established, but almost all have *not* assigned the resources to treat business continuity as a critical priority. A summary of findings follows:

1. Awareness of BCP is minimal and operational understanding is inconsistent.
2. Airports excel at emergency management, but not at BCP.
3. The uniquely complex operating environment at airports makes BCP both more important and more challenging.
4. Supply chain partners have vested interest in airports' business continuity plans.
5. No specific government entity mandates airport BCP for this key sector of critical national infrastructure.
6. Few airports have made BCP a strategic priority or have assigned formal responsibility for BCP.
7. The guidebook and software tool deliverables must be straightforward, easy to use, and broadly applicable.
8. Widespread adoption of BCP at airports will require significant time to facilitate the education and awareness process, and foster broad support.

These findings affirmed the ACRP's premise behind Project 03-18, validated the necessity of the guidebook and software tool deliverable, and mandated that these deliverables be extremely easy to use and broadly accessible to all types of airports and FBOs, biased toward the "beginner."

Deliverables

Guidebook

The guidebook developed in this project is a resource for airports and FBOs to help them:

- understand business continuity planning,
- create a management structure to sponsor and support the process,
- identify a team to develop a plan,
- develop recovery priorities, and the resulting plan, and
- institute a process to create business continuity awareness and a "preparedness culture" throughout their organizations.

The guidebook is an approximately 200 page resource that was written to work seamlessly with an accompanying BCP software tool, which will be attached to the inside back cover of the guidebook in a plastic sleeve, or available for downloading from the Transportation Research Board (TRB) website.

Software Tool

The software tool is a detailed, conditionally constructed, interactive questionnaire that enables respondents to create a basic, customized business continuity plan far more quickly than conventional methods by answering a series of questions about their operations. It produces – in real time – an airport-specific plan onscreen in HTML format, and a paginated plan in PDF format from virtually any modern computer in use at US airports, whose software has been at least somewhat recently updated. The entire survey and plan-generating engine runs locally without the requirement of connection to the Internet. It is the first of its kind BCP tool developed for any industry.

Conclusions and Recommendations

The operational resilience and continuity of US airports would seem to be in the national interest, from an economic, practical, security, and national identity perspective.
Yet BCP is currently not practiced effectively at a majority of airports and is not in the strategic plans of many others. Few airport executives understand BCP or distinguish it from the reactive disciplines that come naturally in aviation – emergency and crisis management. BCP does not currently rise to a level of strategic importance necessary for many airports fund or implement, though it should.

The ACRP 03-18 research team has identified some potential ways to change this dynamic, build awareness of airport BCP, socialize it within the industry, and encourage its widespread adoption.

Transportation Research Board (TRB)

TRB assets and tools, including its website, publications, and conference, should be utilized to help make airport directors aware of the ACRP 03-18 guidebook and tool. The TRB should consider funding advertisements or information pieces about the BCP guidebook and tool in airport-related publications such as *Airport Magazine*.

Industry Associations

The American Association of Airport Executives (AAAE) and the Airports Council International – North America (ACI-NA) should include airport BCP as a topic at their

conferences, making it a track, including a speaker or workshops, and distributing the guidebook and tool. The associations might include the topic at their plenary board meetings and Risk Management Committee meetings. They could engage "centers of competence" in business continuity (e.g. standards bodies) to create an airport-specific adaptation of these bodies' BCP standards guidance and training.

Aviation Schools

Leading aviation schools should include information about BCP in their core curricula, classroom materials and textbooks - possibly in their risk management programs - so that new professionals entering the industry (who, one day, will be running US airports) will have some core exposure to the discipline.

Airport Operators

Municipal, county, state, and multi-state authorities that own and operate airports should impose the same continuity of operations planning (COOP) requirements on their airports that they require of their other government agencies and entities.

Federal Government

US Department of Homeland Security (DHS)

Through the Department of Transportation or the FAA, the DHS might consider encouraging or mandating that airports develop and maintain a credible business continuity plan – at least at major, medium, small, cargo, and reliever airports.

The guidance or mandate could be funded through current grant programs such as the Department's State Homeland Security Program (SHSP), Urban Areas Security Initiative (UASI), or the Regional Catastrophic Preparedness Grant Program (RCPGP).

Federal Aviation Administration

The FAA could similarly mandate the development of a viable business continuity plan as an official obligation in consideration of grant assurances, and might consider funding it through the Airport Improvement Fund. The Administration could develop and publish the guidance in its Airport Compliance Manual, and elevate the topic of airport BCP in appropriate advisories and circulars.

Online Distribution is a Critical Improvement

The TRB should consider that restricting the BCP software from being developed as a hosted online application restricts the ease of access and use at a time when it can reasonably be assumed that a great majority – if not all – airports have pre-existing Internet access. The tool would be far more useful and effective for the industry if it was transformed into an online application:

- Current absence of technical support for the locally-installed product would be far easier and less expensive to provide.
- The single-user/single computer issue would be resolved with airport-specific multiple user management.
- Mac support would not be omitted, opening the tool to far more airport users.
- A single online application would be easy to constantly improve and update, while the current format is not.
- The research team would be able to provide the TRB with regular reports about how the software is being used by airports, and generate valuable usage data analysis that would empirically indicate the tool's effectiveness.

CHAPTER 1: BACKGROUND

Problem Summary

ACRP 03-18 was created because there was wide recognition in the airport sector that a prolonged disruption can have significant negative impact on the aviation marketplace, and that BCP capacity at US airports should be studied and improved. The industry appreciated that, while airports are very good at emergency management, they require significant improvement in BCP.

Problem Statement

The problem statement that initiated ACRP 03-18 noted that airports are an integral part of the transportation system and have a major impact on the global economy. It noted that prolonged airport disruptions resulting in the loss of critical managerial, operational, and business functions can hamper and degrade service in all segments of the aviation market including commercial air carriers, general aviation, military, and other tenants that use airport facilities. In observing that airport operators are experts at emergency response, the problem statement noted that most incidents experienced by airports last less than a day; however, if an airport were to experience a catastrophic event lasting several days or weeks, the impact on the airport, local, regional, and national economy would be great.

In a prolonged disruption lasting several weeks to possibly months, managerial, operational, and business changes would be necessary. While many airports have airport emergency plans, additional information was needed to develop managerial, operational, and business continuity plans. Research was needed to develop a guidebook for airport operators to assist them in planning consistently and effectively for continuity during a prolonged disruption. The guidebook proposed by the ACRP 03-18 research team was to complement rather than duplicate or replace an airport emergency plan.

Current Knowledge about the Problem

Well Established Practice

The ACRP 03-18 research team was built around a group of airport operations practitioners and experienced business continuity consultants with broad exposure to the BCP knowledge and practice within numerous industry segments. That background prepared the team for readily assessing the airport industry's "BCP knowledge and practice quotient", using accepted business continuity methodology such as direct interviews, a business continuity assessment program (BCAP), and business impact assessments (BIAs).

There is a significant body of BCP knowledge and expertise throughout the US and globally. BCP is a core risk management practice at many, if not most major companies. Property and casualty insurance brokers, underwriters, and re-insurers encourage having a business continuity plan as an important ingredient in enterprise risk management; sometimes it is a prerequisite for coverage or favorable insurance pricing.

BCP is a practice that is typically examined during financial audits of public and privately held companies as an essential ingredient in good financial management, because it provides a marker for the organizational capacity to sustain operations in the face of likely disruptions. BCP is often a condition for doing business imposed via commercial contract by customers of companies that require evidence of continuity preparedness.

An entire body of practice, nomenclature, and methodology has developed for BCP, to the point that global industry standards have been promulgated and professional certification bodies credential practitioners at various levels of professional accomplishment. This has been the case for years.

Often referred to as Continuity of Operations Planning (COOP) in the public sector, BCP is a well-established practice at all levels of government as well. Many local, state, and federal jurisdictions require COOP plans of their agencies, administrations, departments, offices and authorities. This guidance or requirement is backed by a series of presidential directives that point to established industry standards.

Premise – Airport Industry BCP is Far Behind

In spite of this well developed body of expertise and expectation, the research team initiated the project from the problem statement assumption that BCP knowledge was comparatively primitive in the airport sector and that the process was poorly understood and practiced inconsistently.

Our research bore out this assumption.

- Little information is available publicly about the practice of BCP in the airport environment; what is available is inadequate and of little practical help to BCP aspirants.
- There is an essential absence of information about airport BCP in aviation school curricula in their operations and risk management classes.
- Few airports from those we sampled seem to have seriously initiated BCP programs, and information was difficult to obtain from those we identified as having some level of practice in place.
- Airports' focus and expertise in emergency management often overwhelms any capacity they might also have in BCP; it was difficult at most airports we communicated with to identify or locate an airport staff member who is specifically responsible for BCP.
- Many airports seem to see BCP as a subset of their emergency management or security efforts. BCP is not widely appreciated as a detailed, disciplined

framework for recovering essential business and operations functions after disruptions and managing around the loss of core resources during disruptions until availability could be restored.
- The research team is not aware of any BCP or COOP consulting firms that specialize in the airport sector.

BCP is, in general, poorly understood and under-practiced by airports. In the opinion of the research team, this situation burdens the industry with a model that risks loss of the sustainability and resilience one would reasonably expect from a critical infrastructure sector of the US economy.

Objectives and Scope of the Project

Guidebook

The objective of the research conducted in ACRP 03-18, therefore, was to develop a guidebook for airport operators to plan and prepare for operational recovery after extensive or catastrophic events that have the potential for prolonged airport closure causing adverse impacts to the airport, and to the local, regional, and national economy.

The guidebook was to include guidelines to provide airport operators of all sizes and types of airports - and FBOs - with a resource to assess, plan, and prepare for recovery that includes infrastructure, managerial, business, and operational sustainability, and continuity. The guidebook was to identify industry best practices and develop a critical path framework to identify the immediate and long-term recovery needs in the preparation for disruptive events.

Software Tool

The guidebook was to be developed with an accompanying a software tool that would enable airports, airport operators, and FBOs to develop their own business continuity plan specific to the needs of their business and operating models. The tool was to include a critical path approach to determining and documenting recovery priorities among airports' essential business and operations departments and functions.

The software tool was to operate on as many computers as possible, via disk or download installation. It was not to be hosted on the Internet, in order to meet the requirement that all kinds of airports would be able to use it without having to subscribe to any service or other software package. The tool was to be somewhat biased toward smaller airports and general aviation facilities that might lack the resources that larger hubs have for professionally developing business continuity plans.

CHAPTER 2: RESEARCH APPROACH

The first three ACRP 03-18 project tasks dealt with the research portion of the project. The team addressed the research demanded by the problem statement by a) utilizing its extensive BCP knowledge and practice experience and applying it to the unique operating attributes of the airport community, and b) "productizing" that expertise with a useful and practical framework, in the guidebook and software tool that we then developed. We familiarized our team with the airport industry by:

- Reviewing relevant airport operations and airport business continuity literature
- Consulting federal airport-related regulations, guidelines and operating practices
- Engaging with industry experts, airport management and academics
- Reviewing representative business continuity plans and practices we were provided or that we discovered at representative airports

Our data collection plan was designed as an incremental progression from the broad and general, to the focused and specific, in a way that captured input, practices, and concerns about business continuity across the entire airport and aviation industry:

Industry Data: dissecting the broad airport market; understanding key issues; clarifying the scope, and categorizing airport types

Literature Acquisition & Review: assembling a body of knowledge: journals, white papers, aviation course curricula, relevant government agency issues, standards & regulations, international practice, aviation association positions on issues, TRB content, airport plans & case studies

Industry Conferences: accelerating our access to the market, creating awareness, credibility and support for the project, and gaining personal access to the key industry associations and government agencies

Business Continuity Assessment Program: assess the issues, problems, resources, organization, funding for continuity capacity, and confirm (or alter) our assumptions; inform the airport-specific BCP Pro Forma

Business Impact & Gap Analysis: performing BIA & Gap Analyses at representative airport types, key FBOs and independent operating entities

Figure 1.   *Data collection methodology*

Task 1 – Review and Analyze Existing Practices and Documentation

Task Charter

Conduct a thorough review of all relevant information, including published technical guidelines, existing literature, and applicable case studies. Information reviewed should include international experience as well as that of other related industries. The review should include business continuity plans, real-world case studies, existing airport plans, and other appropriate material relative to private business continuity planning, associations with comparable programs for public use facilities, and other transportation industries or large public venues (e.g., marinas, rail, stadiums, and shopping malls). Develop an annotated bibliography and provide a matrix of different aviation and non-aviation associations and resources as they apply to the research objective.

Methodology

In our search of the publicly available literature related to airport business continuity, resilience and recovery, we found a limited amount of information related to airport business continuity practices. What we did find was sourced from available documents, journals, articles, regulations, laws, standards, and policies pertaining in some way to continuity at airports. We reviewed each document to understand as much as we could about the current thinking and practice around business and operational continuity at airports. We developed a document organization framework for categorizing and organizing literature and standards acquired during data collection activities, and placed documents and document references in that framework, for relevant inclusion in the final project deliverables. We queried the following categories of sources:

- Public Content
    - Websites
    - Journals
    - News
    - TRB Publications
- Restricted Circulation Journals
    - Subscribers
    - Members
    - Approved Professionals
- Regulations/Standards/Guidance
    - FAA
    - TSA
    - NTSB

- o NFPA
- o ASIS
- o ISO
- o BSI
- o PS-PREP (DHS)
- o Industry – DRII, BCI
- Airport Business Continuity Plans & Case Studies
- Academic Resources
  - o Aviation Curricula
  - o Refereed Papers
  - o Educational References
- Record of Relevant Legislative Committees or Subcommittees
- Other

Particularly useful documents or references were rare. Most proved to be mere BCP "mentions" and none really presented the team with any concrete or helpful data that would impact the development of the guidebook and software tool.

Our Amplified Work Plan was the deliverable from Task 1, and was submitted to the project Panel in June 2010.

Task 2 - Develop Data Collection Plan

Task Charter

Develop a data collection plan that includes interviews and focus groups comprising a representative sample of airports to include a variety of airport sizes and types, and other entities, as identified in Task 1, which have experienced catastrophic operational and business disruptions and/or have operational and business continuity plans.

Methodology

The research team developed a comprehensive Data Collection Plan based on the hierarchical methodology described in Figure 1. The Data Collection Plan included the following elements:

Conference Attendance

The research team selected a number of airport industry conferences and workshops to attend within the period of time we had set aside for data collection. We predicted that the value of these confabs would be in our ability to meet - off-schedule - a significant

number of airport executives with whom we could discuss the project, vastly improving our recruitment rate and ultimate response rate to the questionnaire.

Other Data Collection Meetings

Researchers additionally planned to meet with a number of airport industry stakeholder groups that were not going to be asked to participate formally as respondents to the Business Continuity Assessment Program (BCAP) Survey. Interviews with these highly relevant groups were thought to be able to help researchers understand these organizations' positions, vested interests, observations and recommendations about the importance of effective BCP at airports.

Business Continuity Assessment Program (BCAP) Interviews

To ensure a sufficient breadth and scope of research - so that we would be assured of a representative sample of airports and FBOs – the research team developed a matrix of 41 participating airports, airlines and FBOs from those we interacted with during conference attendance. Research participants would take the comprehensive BCAP survey, and their results would indicate precisely how advanced, basic, or unaware these representative sample of respondents were in their BCP knowledge and practice. **(See the research matrix in Appendix C.)**

Our Data Collection Plan was the deliverable from Task 2, and was submitted to the Panel in July 2010.

Task 3 - Implement Data Collection Plan

Task Charter

Implement the approved data collection plan.

Methodology

Throughout this data collection process, researchers applied generally accepted business continuity planning analysis to the unique airport operating model, specifically addressing the needs of all airport types and critical operating entities that contribute to essential airport operations. Using accepted industry analysis would ensure that the guidebook and software tool (which are the ultimate deliverables from this ACRP 03-18) would be framed and constructed to be helpful, instructive, and effective for every kind of American airport and FBO.

Conferences

From a master list of 89 different airport workshops and conferences we compiled for possible research and outreach during data collection, the research team narrowed the scope down successively to nine conferences, which we attended. We contacted each individual conference and workshop organizer – the AAAE, ACI-NA, and the Airport Ground Transportation Association (AGTA) – and arranged to be publicly introduced by the conference organizer, so interested airport executive could meet and discuss participation in the research. Three conferences put us on their agendas, and we presented ACRP-approved materials to good acclaim. Those we attended included:

- AAAE Basics of Airport Law Workshop
- American Association of Airport Executives (AAAE) General Aviation Issues and Security Conference
- AAAE Large Hub Winter Operations Conference
- Airports Council International – North America (ACI-NA) Small Airports Conference
- ACI-NA Insurance and Risk Management Committee Meeting
- AAAE National Airports Conference
- Airport Ground Transportation Association (AGTA) Fall Meeting
- ACI-NA Annual Conference
- ACI-NA Airport Concessions Conference

The value of these confabs was that we were able to meet and interact with a significant number of airport executives, from which we recruited the final 41 that would take the BCAP questionnaire. This personal approach resulted in a better than 85% questionnaire response rate – far better than we would have experienced had we used a conventional blind mass direct mail or Internet approach, because researchers were able to describe 03-18 thoroughly and develop personal relationships that were important for us as industry newcomers.

(The specific results of attending each of these conferences are included in Appendix B.)

Other Data Collection Interviews

Researchers conducted telephone or in-person interviews with a significant number of knowledgeable people in aviation education, industry associations, trade groups, and government agencies. We also reached out to several labor groups, such as the Air Line Pilots Association (ALPA), Association of Flight Attendants (AFA) and the International Association of Machinists and Aerospace Workers (IAMAW), but were unable to schedule interviews with their representatives.

Feedback from interviews with these organizations helped the researchers understand the complexity of airports as businesses "operated" by a confluence of players – airports and

their owners, FBOs, airlines, tenants, and government agencies – and informed the kinds of operating and business questions we asked respondents in the BCAP Survey. Each group was helpful in offering important contacts, suggesting airports for participation in the research, and describing issues they felt might be relevant to the success of the research.

Project researchers also arranged, through a technology engineer, a tour of the electronics and communications floor of the FAA tower at JFK airport, to understand the system's complexities, redundancies, and interdependencies within the technologies the airport provides, including electronics, communications, and NAVAIDS elements of a large-hub airport.

Education Interviews

- Daniel Webster - John Prohaska, Dean
- Embry Riddle - Dr. Chunyan Yu
- University of North Dakota - Dr. Kim Kenville
- Ohio State University – Dr. Seth Young

Industry Interviews

- Airlines for America (A4A)
    o Clint Fisher, *Director of Government Affairs*
    o Eric Thacker, *Director of Security Operations*

- National Business Aviation Association (NBAA)
    o Doug Carr, *VP Safety, Security & Regulation*

- National Association of State Aviation Officials (NASAO)
    o Kathryn Solee, *Director of Operations*

- National Transportation Safety Board (NTSB)
    o Thomas Haueter, *Director, Office of Aviation Safety*

- National Air Transportation Association (NATA)
    o Michael France, *Director of Regulatory Affairs*

- American Association of Airport Executives (AAAE)
    o Spencer Dickerson, *Senior Executive Vice President*

- Airports Council International – North America (ACI-NA)
    o Met with and addressed the *Risk Management Committee*

- National Air Traffic Controllers Association (NATCA)
    o Dale Wright, *Director of Safety and Technology*

- Aircraft Owners and Pilots Association (AOPA)
    - John Collins, *Manager of Airports Policy*

Government Agency Interviews *(of staff responsible for operational recovery at airports)*

- Federal Aviation Administration (FAA)
    - Laura Valero, *Pandemic Flu Coordinator*
    - Carl Alvarez, *Crisis Response, Emergency Operations and Exercises*
    - James White, *Deputy Director, Airport Safety and Standards*
    - Frank Peluso and Beverly Farrance, *Technical Operations, Field Incident Response*
    - Maurice Mason, *Crisis Response and Emergency Operations, Air Traffic System Operations Security*
    - Steven Vaca, *ATO-Systems Operations Security, Crisis Response, Emergency Operations, and Exercises*
    - Gus Waters, *Terminal Operations*
    - Kapri Kupper, *Air Traffic Control System Command Center*

- Transportation Security Administration (TSA)
    - Jim Marchand, *National Exercise and Training Coordinator, Contingency Preparedness Program*

- Customs and Border Protection Agency (CBP)
    - Dario Lugo, *Branch Chief, Incident Management Branch, Office of Intelligence and Operations Coordination*
    - Dave Lambrix, *Operations Manager*
    - Enrique S. Tamayo, *Program Manager, Field Operations*
    - Daniel Newton, *Program Manager, Field Operations*
    - Bob Moore, *Business Resumption Planning*

- Air National Guard
    - James A. Rogers, *SMSgt, USAF, Airfield Management, Functional Manager*

Business Continuity Assessment Program (BCAP) Interviews

The most helpful information related to existing business and operational continuity practices at airports proved to come from these direct questionnaires. The surveys helped researchers identify examples of several BCP models being practiced, representing a wide range of sophistication and practice. We purposely included in the research sample several airports we knew had recently completed business continuity plans, so we could review and analyze examples of the most current practices.

Two elements comprised the final phase of the Data Collection Plan – the Airport Operations Questionnaire and BCAP Survey, followed by the Business Impact Analysis (which was part of our work in Task 5.)

The team constructed a target sample matrix of airport organizations to receive the Operations Questionnaire, designed to give us an inclusive data set across those types of entities that are responsible for mission-critical airport functions, directly or indirectly:

- Airports – two to five each across the FAA airport categories, representative by geography, ownership, and FAA type/size
- FBOs – spread across large national companies and small local entities, covering activities such as flight operations, fueling, hangar storage, air charter, corporate flight operations, catering, and parking.
- Airlines – flight operations across all areas - public, sterile, Secure Identification Display Area (SIDA), and Airport Operations Area (AOA)

The matrix was intended to over-weight smaller and general aviation airports. **(The team collected completed questionnaires in at least two airports in each category, plus the FBOs and airlines shown in the final matrix shown in Appendix C.)**

While researchers compiled the matrix from the personal meetings we had at the conferences, we updated our standard the Business Continuity Assessment Program (BCAP) questionnaire with airport-specific terminology and questions framed to be effective in the industry. In doing so, we learned that many "process artifacts" that had been categorized to us in an emergency or crisis capacity would be very helpful and informative as basic components of effective airport business continuity practices. The team adjusted the BCAP Survey to make sure we could reference and utilize this valuable information, even if it was not part of an airport's formal BCP document.

The research team developed and facilitated a 184-question Airport Operations Survey and BCAP using the Zoomerang online survey tool. A total of 41 respondents who had agreed to take the survey about their BCP practices were provided access to it online. Eighty-five percent of those completed the questionnaire, for a total of 35 responses. At only six of these airports did the research team document a functional level of business continuity planning:

- Dallas Fort Worth International Airport
- Ohio State University Airport
- Denver International Airport
- Cincinnati/Northern Kentucky International Airport
- Phoenix Sky Harbor International Airport
- Van Nuys, CA

(Sample of BCAP Survey Questions is shown in Appendix D.)

Surveys were completed in March, 2011.

Task 4 – Interim Report with Draft Outline

Task Charter

Prepare an interim report that analyzes the information from Tasks 1 through 3 and identifies current practices. The interim report was to include a draft detailed outline of the guidebook that identifies the following: (a) elements of the operational and business continuity plans; (b) elements of the critical path framework to determine immediate needs and next steps; (c) possible risks and a sample response template; and (d) recommendations for industry best practices based on the research, interviews, and focus groups.

Methodology

The research team developed a 129-page Interim Report, including the Draft Guidebook Outline, and submitted it to the Panel for review and comment. The report provided an analysis of the methods used and data obtained during the first three tasks. It identified the state of current business and operational continuity planning across the industry and included our findings and an initial draft outline of the Guidebook that:

- articulated standard leading practice elements of operational and business continuity plans that we found at airports

- contained a summary of the elements in the critical path framework that can help users determine their appropriate level of BCP planning, their immediate needs based upon their current state, and logical next steps necessary to take their plans and capacity to the next threshold level

- described potential risks

- included a sample response template or model, and

- recommended industry best practices based on the research, interviews, questionnaire, survey, and BIAs.

The research team submitted the Task 4 deliverable - Interim Report and Draft Guidebook Outline – to the Panel in January 2011 for its formal review and comments.

The co-principal investigators met with the ACRP 03-18 Panel in Washington in March 2011 where we discussed the report, project and timeline in detail, made several necessary course corrections, and made several final clarifications in scope and design of the final deliverables.

Task 5 – Develop Restoration Priorities

Task Charter

Develop concise guidelines for determining the priority for restoring operations based on how quickly all required assets and resources can be restored for airport operations. These guidelines should include, but not be limited to, airport airside and landside infrastructure, terminal, passenger and cargo facilities, fuel storage facilities/systems, on/off-airport parking, car-rental facilities, fixed base operators and other general aviation facilities, catering/concessions, airport technology systems, administrative and financial systems, and relevant assets and resources. Address elements to restore operations that will have an economic impact on the airport, local, regional, and national economy.

Methodology

To fully understand airport-specific recovery priorities, the research team observed a level of detail about functional dependencies during on-site Business Impact Assessments (BIAs). Combined with our understanding of good business continuity practices, this observation enabled the team to lay out an optimal priority model quickly.

The team completed extensive on-site BIAs at these participating airports:

- McCarran International Airport
- Salt Lake City International Airport
- Louisville International Airport
- Block Island State Airport
- Fort Lauderdale Executive Airport
- Denver International Airport

Conducting BIAs - a standard and fundamental practice in BCP - provided a very granular examination of exactly how core airport functions and departments operate and interrelate. The BIAs we performed generated information about how long essential airport functions can be "down" or unavailable, and operated without critical supporting resources, before their disruption impacts the airport's operational viability.

At each airport, researchers interviewed each business and operating function and department, identifying the core processes they operate and how these processes share resource interdependencies. We identified their negative impact on the airport's operational continuity should they be degraded or lost during a disruption, and began to create a framework for the orderly recovery of each process and function. This helped us to identify some common recovery priorities at airports.

The research bias was toward the *impact to the airport* and how to mitigate the effects of disruptions and recover from them, rather than on secondary disruptions to entities that might be important to, but do not *materially* affect the airport's operating mission. Researchers viewed good business continuity planning as a response to a prolonged disruption of airport operations *when* disruptions occur, not *if* they occur.

The choice of airport participants enabled the team to generate operating data and recovery priorities from both western and eastern airports, to obtain a perspective of both winter operations and the shared infrastructure services model, and to include a small FBO-operated facility as well as a general aviation airport in the hurricane belt, as we considered some common restoration priorities. The research team considers these to be a reasonable and representative cross section of airport models.

The Completion of the BIAs and the development of general Restoration Priorities in June 2011 were the deliverables from Task 5. (**See the Airport BIA Description in Appendix E.**)
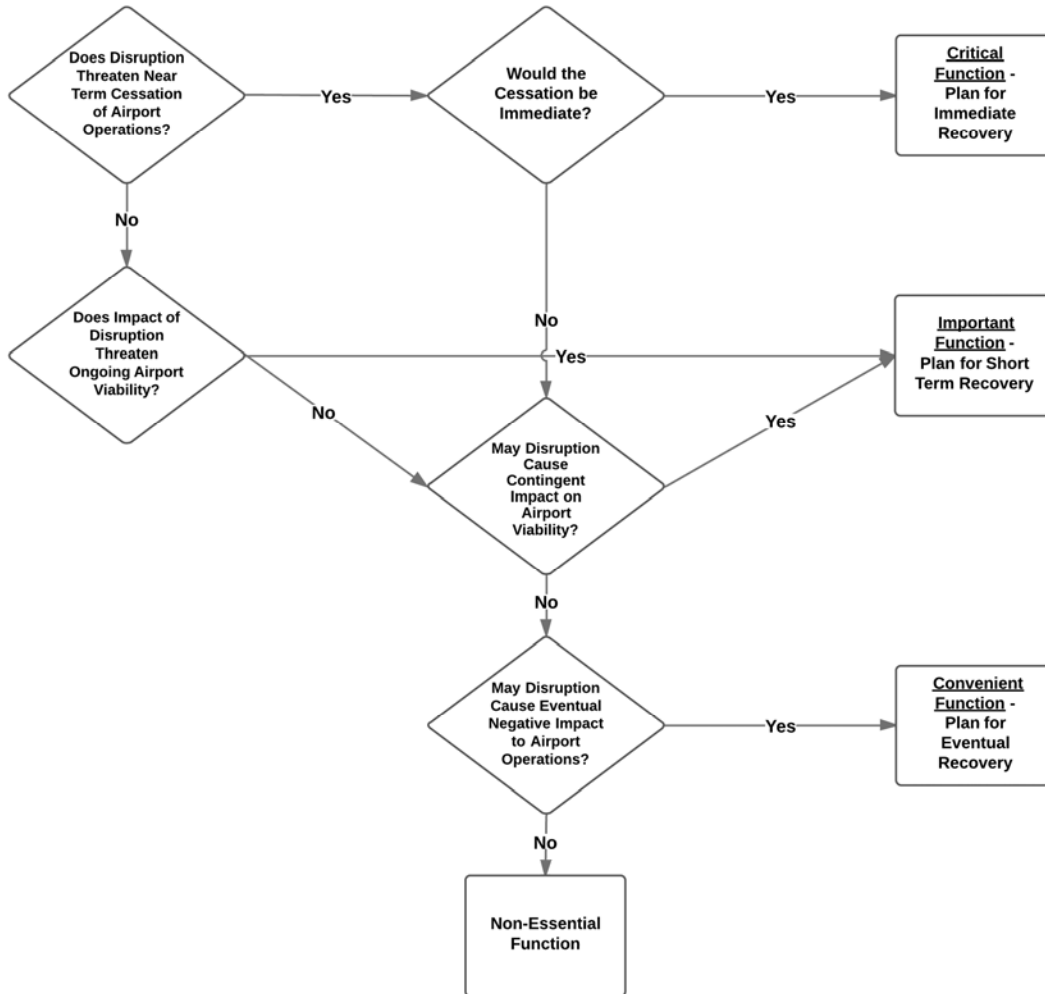

Figure 2. *Restoration Priority Framework*

Task 6 – Develop Framework, Template and Tool

Task Charter

Develop a managerial, operational, and business sustainability and continuity critical path framework for the guidebook. Finalize the list of possible risks and the sample response templates identified in Task 4. Produce an electronic tool or interactive spreadsheet that uses sample response templates to generate protocols for each type of risk. Finalize the recommended process into a detailed plan that describes best practices identified in Task 4.

Methodology

More Sophisticated Tool

The ACRP 03-18 Panel originally envisioned the software tool deliverable to be a simple automated guide to help airports think through their recovery priorities. However, given the undeveloped state of BCP at airports, the research team instead determined that the industry would be better served with a more sophisticated tool that would actually develop individual business continuity plans for each airport user.

This determination led to both positive and negative results. The tool that we developed in the end was a first of its kind for any industry: a highly intelligent and interactive tool that will deliver a custom plan, based on a highly customized navigation through a comprehensive set of operation questions. (As a comparison, a similar project funded by the water utility industry resulted in an overly simplistic brief BCP plan template with fill-in-the-blank data – an approach that our research team rejected as largely ineffective.)

Negative implications of the decision to build a more sophisticated tool were that the iterative design, development, coding, and testing process required far longer than the project had originally been allocated. This in turn required significantly greater expenditures by the research team, for which we could not be additionally compensated because such an extension mechanism does not exist within current TRB process.

Design and Architecture

The research team completed development of the framework, template, and tool by first developing the overall design and architecture of the software, which we presented to the entire Panel in a "GoToMeeting" Internet presentation in November, 2011. Because the guidebook was to include a thorough explanation and user guide for the software tool, researchers decided that its design was the priority at this stage in the project.
The purpose of this presentation of the tool architecture was to ensure that panelists understood the approach the team would take in building the tool, and how that design

would deliver the functionality that we wanted it to have. Panel comments were helpful in designing several adjustments in the tool graphical user interface and functionality.

At this stage of the project, the team developed the draft guidebook to a minimal level of completion, where we kept it until the software tool was nearing completion. This is because the development of the guidebook – incorporating a tactical "play-by-play" guide to using the software tool - needed a lag before the completion of the software in order for its content to have any contextual meaning or value to the user.

Our technical team began the tool development process in April, and proceeded on a path that we ultimately decided to change. The research team brought on board a new and more appropriately experienced technical team in the fall of 2011; this team then laid out an optimal course of development.

The strategic challenge was that every individual airport has a unique set of recovery and restoration priorities, based on their locations, size, ownership, mission, and many other factors. Thus, there could never be an accurately uniform set of standard or airport recovery priorities. The tool had to adjust somehow for the site-specific input of thousands of different airports, while remaining relevant to all.

The grand design challenge was to create a software application that a) could be equally valuable across every kind of airport, from small general aviation facilities to the largest and most sophisticated airports, b) would be easy to use and require no BCP knowledge, and c) required no licenses or subscriptions of any kind – to software or the Internet.

The software tool was designed as a survey application that would be extremely easy to use by non-professionals at any US airport. It included detailed questions in 34 areas of airport business and operating functions. Answers to survey questions would either be inserted by the tool into a core BCP plan document in HTML format, or they would conditionally include or exclude plan content. The result would be that any type of airport or FBO could answer facility-specific questions and generate, in real time, a business continuity plan customized to its unique operating circumstances.

The tool re-design required eight months to develop and code. It included a mechanism for developing 2,000 airport-specific questions that were conditionally presented as the engine navigated users though only those questions pertinent to their airports. Answering many questions either conditionally included or excluded follow-on questions. A question development and integration engine and a document insertion capability were developed, followed by the actual survey application and graphical user interface (GUI).

The completion and presentation of the BCP software tool architecture to our Panel in November 2011 was the core deliverable from Task 6.

(Appendix F shows the architecture of the toolset and the survey application.)

Task 7 – Develop Airport Business Continuity Guidebook

Task Charter

Prepare the draft guidebook for airport operators to plan and prepare for catastrophic events. This guidebook will include concise guidelines to provide airport operators with a step-by-step procedure for identifying what priorities are to rebuild, repair and replace components of service and facilities to assure a quick airport recovery. It will also include a critical path framework to determine the immediate and long-term needs in the preparation for catastrophic events.

Methodology

The research and technical teams worked another 12 months to develop the entire question set for the BCP survey application, build these questions and their conditional properties into the software, develop and load the base business continuity plan document into the application, link survey answers to the plan document, and design and code the actual application and GUI.

From their BCP industry knowledge, and from the BCAP and BIAs, the BCP experts and the airport operations experts on the ACRP 03-18 research team developed a set of approximately 2,000 airport-specific questions that produced data and information that is core to good business continuity plans.

Our BCP experts developed a core airport business continuity plan that had intelligent "hotspots" throughout so that survey answers could insert content, or toggle on or off appropriate portions on the plan, based on respondents' answers.

The technical team iteratively designed, coded, and tested the software, integrating a number of specialized open source tools and engines into the product so that it will be usable on the broadest possible number of computers that a wide variety of airports may use.

As the software application was taking its final shape and the team gained a cohesive understanding of how the navigation, features, and functionality would work, other team members completed the draft of the BCP guidebook, a 200-page resource to help airports understand and implement their own business continuity plans, and to guide them in using the software tool to develop their own plans.

The completion and submittal of the BCP guidebook and a live demonstration of the BCP survey application to our Panel in December 2012 were the deliverables from Task 7.

The software demonstration intentionally omitted several final features that were later added during the team's Task 8 work.

Task 8 – Submit Final Guidebook and Software Tool

Task Charter

Submit the final deliverables including: a final guidebook with interactive tool and a final report that documents the entire research effort, explains and justifies recommendations, and provides background information used in the development of the guidebook.

Methodology

Guidebook

The ACRP 03-18 Panel provided very helpful feedback, as beta testers of both the guidebook and software tool. Panelists wanted the guidebook to stand alone as a means for airports to develop their own business continuity plans without the software tool, so their advice was to incorporate additional sections to assist airports in formulating their plans with the requisite organization and elements.

Researchers made a substantial number of edits and changes to the guidebook from this input, which markedly improved its effectiveness. When the software tool was completed and tested, final guidebook edits were made to ensure that the most appropriate screen shots were used as figures, and that descriptions of the navigation aligned with final tool functionality. The team's technical writer then edited the final draft for flow and clarity. The final guidebook is fully described in Chapter 4 of this report.

Software Tool

From the December 2012 live demonstration through June 2013, the technical team completed the final stage of coding, integration, and testing. All known technical issues were resolved, and those core features that were not shown to the Panel in December were added – question accessibility, instance management, and final conversion of completed plans from on-screen HTML format to conditionally formatted and paginated PDF output documents complete with tables of content. The final tool is fully described in Chapter 4 of this report.

CHAPTER 3: FINDINGS AND APPLICATIONS

Findings

Airports are a very public and symbolic sector of our nation's critical infrastructure. Many/most citizens and organizations have intimate experience with airports – using them occasionally or frequently. Operational resilience and continuity at airports would seem to be in the national interest, from an economic, practical, security, and national identity perspective. Yet BCP is currently not practiced effectively at a majority of airports and is not in the strategic plans of many others.

Lack of Awareness

Research found that awareness of BCP by US airports is minimal, and operational understanding of the process is inconsistent. BCP "sounds good" but is not broadly practiced.

Not a Strategic Priority

As a result of the lack of awareness, few airports have made BCP a strategic imperative, funded it, or assigned formal responsibility for BCP. In those cases where the research team found some continuity planning at airports, it tended to be "owned" by a single person or an internal technical department, and not prioritized in the strategic plan by management.

Confusion with Emergency Management

One of the reasons for the absence of strategic import is that many in airport management confuse BCP with their safety and emergency management efforts, which are – by comparison - very well developed. This confusion aligns with similar misperceptions of the two practices in the market in general. There is not an appreciation for the fact that emergency management is an incident-centric process that deals with protecting life and property, while BCP is an incident-agnostic process that deals with recovering essential functions, processes and data regardless of the cause of their disruption.

BCP is Challenging at Airports

The uniquely complex operating environment at airports makes BCP both more important and more challenging. Many airports are intricate supply chains, in which each partner has a vested interest in the airport's business continuity plan. Essential functions are often the contractual or statutory responsibility of a contractor, tenant, airport operator, or government entity – each a supporting component of the airport operation as a whole. Managing for recovery of multiple important processes, people, technology and plant and equipment – many controlled by entities other than the airport management itself – makes BCP significantly more difficult in the airport environment than in a conventional vertical organization.

No Existing Mandate for BCP at US Airports

No specific government entity mandates airport BCP for this key sector of critical national infrastructure. Research indicates that neither the FAA nor the DHS requires BCP at airports. Likewise, unless states and local governments indirectly include airports in their COOP guidance and requirements, the research team found no proactive requirements for BCP at airports operating in their jurisdictions.

ACRP 03-18 Deliverables Will Have An Impact

It became clear during the team's work with sample airports that the guidebook and software tool deliverables – if they are straightforward, easy to use, and broadly applicable – will have a positive effect on airports' understanding of BCP and on their capacity to implement it, by providing clear, non-technical information and a step-by-step framework. To make a positive impact, deliverables must address the unique complexity of airport BCP in a straightforward way.

Adoption Will Require Time and Funding

Widespread adoption of BCP at airports will still require a long period of time, along with an education and awareness process that is broadly supported by the TRB, airport industry associations, and aviation schools. Adoption would be more timely and more likely if it is encouraged by specific guidance from the DHS and the FAA (as well as from the states), and more readily received if it is supported with adequate funding mechanisms. Any airport-specific standards will require collaboration with relevant standards bodies and BCP organizations.

Applications

The Project De-mystified and Defined BCP

The results of ACRP 03-18 went a long way toward de-mystifying BCP. The guidebook carefully defined BCP and distinguished it from related practices. It described why steps in BCP are important and how their results are used. The guidebook documented BCP standards, offered a step-by-step process, and defined industry terms of use. The software tool guides users through a straightforward survey that builds a plan customized to the operational environment of each airport or FBO user.

Real Competitive Advantages for Airports that Adopt BCP

Airports that adopt BCP as an ongoing discipline and practice will be far ahead of the industry norm in their capacity to recover essential functions and restore core processes after suffering prolonged disruptions. They will be better able to accomplish tasks when supporting technology and data are unavailable during these disruptions. This will help these airports support all of their constituencies, and will be beneficial to them for legal, regulatory, contractual, commercial, competitive, liability, and economic reasons.

Project Deliverables Are Practical Tools

The guidebook and software tools developed as part of ACRP 03-18 were designed to be usable by – and helpful to – all US airports. The guidebook was written to provide an adequate background and justification for implementing BCP at airports, and it was designed as a question-by-question guide for using the survey tool. The guidebook can be used for developing recovery priorities, documenting recovery support requirements, succession planning, developing manual work-arounds, hiring BCP staff, and imposing recovery requirements on airport operators, contractors, and tenants. The guidebook can be used to meet regulatory or statutory COOP requirements.

The software survey tool is a start-to-finish automation of the full BCP process. Answering all relevant questions delivers a customized business continuity plan by anyone at the airport with or without any BCP knowledge. Its mission and purpose was broad, its design specifications were complex, and its technical parameters were stringent. Facilitating a process as complex as BCP for thousands of different types of non-certified airport users was a difficult task, but the end result was an innovative BCP software tool that is a first-of-its-kind available in any industry.

Basis for the Airport Industry and its Regulators to Support BCP

The results of ACRP 03-18 can be used by airport industry organizations and their federal and state regulators to develop programs and standards that encourage BCP at airports, promote guidebook and software usage, and aid airports in embracing and adopting BCP as a good industry practice. The capacity for orderly recovery of the core functions of every airport should be essential. This project should provide the research basis to these entities for the implementation of efforts supporting and requiring BCP at US airports.

Opportunity for Industry, Regulators and BCP Groups to Collaborate on Airport BCP Standard

The research project can also become the basis for industry organizations and regulators to work with standards bodies and BCP organizations to develop and support an effective airport BCP standard.

Limitations of the Project Findings

Extrapolating From a Small Sample Has Risks

The research team was only able to assess its final 36 airport respondents as part of our BCAP process, and we only had time to conduct BIAs at six airports. Extrapolating from this small sample size carries the risk that our projections may be more difficult to apply broadly to the thousands of US airports. This could overestimate or underestimate the applicability of our conclusions. The research team may well have omitted excellent BCP practices at airports that were not part of the research sample size.

One-Size-Fits-All Tool Is Not Optimal In BCP

Because BCP is necessarily the product of detailed analysis of complex functional and process relationships, developing a single tool for use by airports varying widely in size, complexity and sophistication is not optimal, because it may not be able to capture the highly detailed essence of each airport's operating model. Ideally, every airport interested in developing a business continuity plan should develop its own, with certified internal and/or external BCP professionals.

Technical Support For The Software Tool Is Unavailable

Even though the BCP tool was designed to be easy to use, it is a complex piece of locally installed software that ideally includes technical support. It is economically impractical, however, for the research team to provide open-ended technical support either online or by telephone. This may frustrate airport users.

Tool Does Not Support the Mac Platform

For time and budget reasons, the research team developed the software tool for the PC user environment, and was unable to support the Mac community. Likewise, while the team strived in its design to support the widest possible number of PC versions currently in use, there may be some older and less often updated computers that are not supported, if they do not run at least Windows XP (SP3) and Windows 7.

No Software Updates, Usage Tracking or Data Analysis is Possible

As a tool not hosted as a single application on the Internet, the airport BCP software cannot be updated and improved. It cannot track usage by airports, or generate either the usage reports or data analysis that could be extremely helpful to the TRB in judging how helpful and effective the tool is for airports.

CHAPTER 4: DELIVERABLES

The final four project tasks addressed the development of the two key deliverables – the BCP guidebook and the accompanying software tool.

Guidebook

Design Objectives

The BCP guidebook was designed with three objectives:

- Provide clear background, terminology, definition, and strategic justification for BCP.
- Be a step-by-step guide to creating a BCP organization and developing and testing a plan.
- Provide a user guide to accompany the BCP software survey tool.

It was to be clear and highly accessible, written to non-BCP professionals, and slanted toward the needs of smaller airports and FBOs.

Challenges

In documenting BCP practices from its years of experience in BCP and from the understanding it gained during the research portion of ACRP 03-18, the key challenge for the research team was to articulate in non-technical terms how airports should go about developing a "recovery culture", naming a BCP team, and actually writing a continuity plan – for a wide audience of thousands of airports, industry players, and observers with a widely diverse set of needs. BCP usually requires well trained professionals who understand the practice and its application in specific industries. The guidebook had to be a stand-alone resource that would be instructive and effective in the absence of professionally certified practitioners at most airports. It was difficult to map the complexity of BCP to a single tool that could streamline what is an inherently challenging process.

Critical Path Framework

The objective to define recovery priorities in a critical path framework was the most problematic, because these priorities can only be practically established through an airport-specific analysis of the sensitivity of each essential function to downtime and data loss. Because of the wide differences that exist in operating models, locations, challenges,

and missions at airports, such an analysis should yield a different set of recovery priorities at each individual facility. There could not be an easy one-size-fits-all answer. Instead, the research team outlined a thought process around determining recovery priorities based on relative criticality to each airport's fundamental mission and operating model as unique economic entities.

This process replaced or contracted the normal BCP practice of developing precise recovery time objectives (RTOs) and recovery point objectives (RPOs) for each essential airport process and function. The framework was built around the severity of disruptive impact relative to essential airport functions, with disruptions that could cause an airport shut-down or cessation of operations rated the highest priority, those that caused serious impact to airport economics rated middle priority, and those whose impacts were less immediately severe rated among the lowest priorities.

Guidebook Organization

The guidebook contains approximately 54,500 words and runs almost 200 pages (in pre-published Word format). Based on the amount of data each airport inserts, the final plan that will be produced from the software tool can reach several hundred pages, when fully complete. Approximately 35% of the guidebook content addresses background, justification and definition of BCP, and provides a guide to developing a BCP program at airports. Almost 65% of the guidebook is a user guide for the BCP software survey tool, providing over 90 figures of screen shots that illustrate the tool and enable airport survey respondents to circulate to all departments the types of data they should collect for insertion into the tool. **(The table of contents of the guidebook is illustrated in Appendix G.)**

Software Tool

Design Objectives

The survey software had to truncate and "collapse" the entire BCP process into an easy-to-use tool for use by potentially thousands of BCP neophytes. It had to create a replacement for calculating recovery time objectives (RTOs) and recovery point objectives (RPOs), as measures of functional sensitivity to downtime and data loss, respectively. Its questions had to align generally with airport terminology and operating environments. Technically, the tool had to be usable on the maximum number of target computers possible, without knowing the technical characteristics or limitations of that enormous universe of devices.

Use of the tool had to be subscription and cost-free, implying use of open source code, tools and engines in an application that was to run locally on these computers and not hosted online as software as a service (SaaS). When any airport was finished answering

the almost 2,000 business and operating questions, the software tool had to generate a custom business continuity plan containing airport-specific data, in a useful output format. The user interface of the software tool is illustrated in the following two figures.
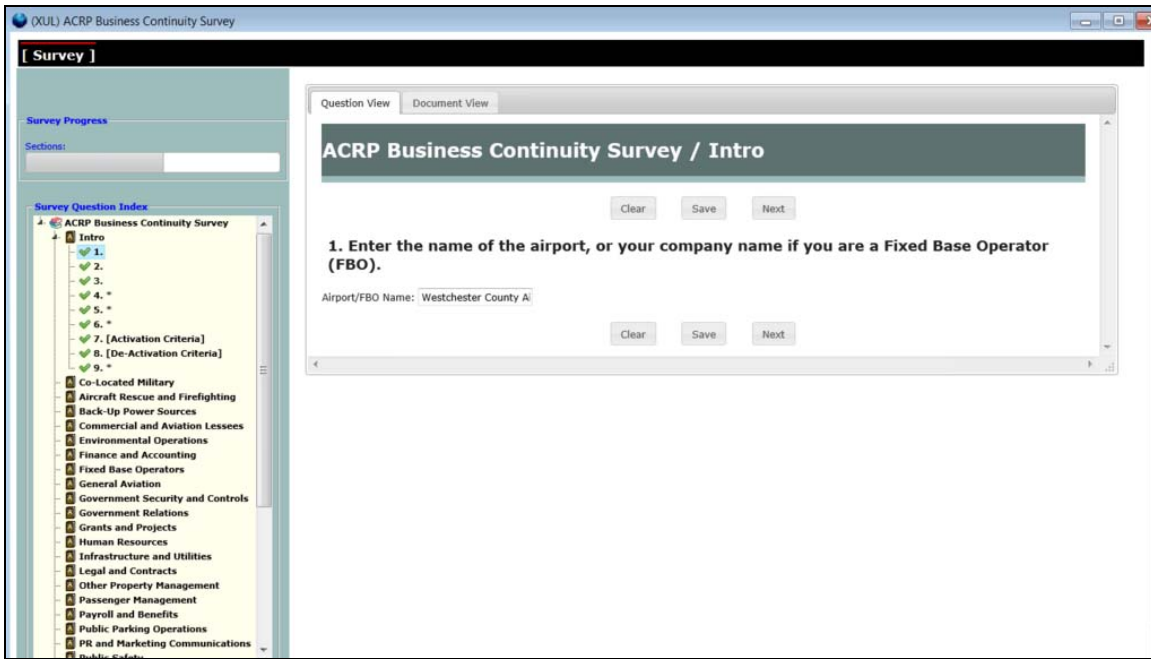

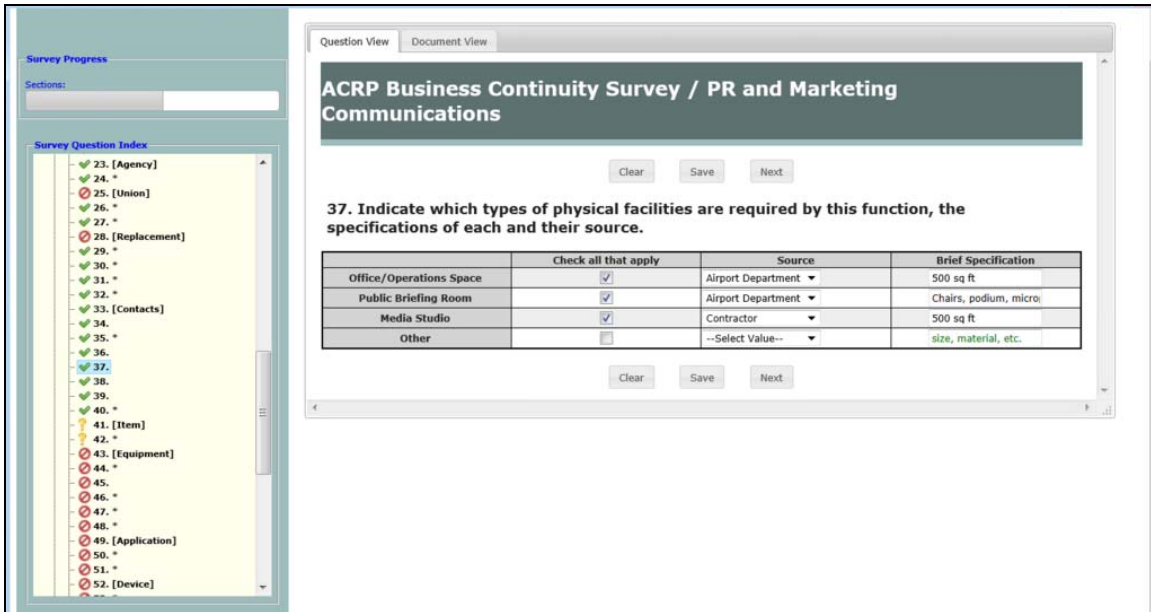**Figure 3.** *Illustration of the first survey question*

Figure 4. *Illustration of a data question and the Survey Question Index*

Challenges

A number of technical challenges faced the research team. It was difficult to design a license-free or subscription-free product that mimicked the complex and highly site-specific BCP process and made it easy and accessible to a large unknown universe of respondents. The process required the research team to go through a constant iterative cycle of design, integration, adjustment, data loading, and testing over almost 18 months.

Research into open source tools required time to understand if and how they could be integrated intelligently into the software. For example, to emulate an online application experience locally, the Firefox browser was integrated into the BCP tool. Many other engines and functions were similarly integrated. Construction tools had to be developed to create the survey questions, assign conditional attributes to potential answers, link those answers to specific locations within a 150 page core BCP plan document, and dynamically construct a document specific to every individual airport user.

Final output of each unique plan had to be in a useful, license-free format - a requirement that eliminated the option of MS Word output. The PDF format was selected by engineers, using an innovative process to transform a plan shown by the software on-screen in HTML format into a PDF document. The PDF had to be accurately paginated and formatted dynamically, with a full table of contents and appropriate page breaks – regardless of the variable data each respondent inserted into their plans through the software.

Because the software was not able to be delivered as an online hosted application available to users over the Internet, the research team was forced to develop it as a single user application, which reduces its effectiveness and usefulness to airports. Because the downloaded or locally-installed tool (via a CD) had to save all previously answered questions, there was no way to spread use of the tool among simultaneous airport users.

Instead, all survey input had to be concentrated on a single user. Alternatively, the computer at the airport that contains the active survey tool would have to be passed among each operating department, so the entire body of airport data would reside on a single instance of the tool. If this did not occur, there would be no central (i.e. Web-based) engine that could accumulate survey input from multiple users into one repository from which a cogent business continuity plan could be generated with full version control.

Software installation on PCs running at least Windows XP (SP3) and Windows 7 requires users to locate the installation executable file on the CD – or on the unzipped download from the TRB portal – and run it. Running the "setup.exe" file can work differently for users, depending on the browsers they use. For users on enterprise-administered workstations at the airport, the install process will require that they have a system "Administrator" privilege or ask such an Administrator for assistance.

Structure, Features and Functionality

The final result is the first of its kind survey tool that provides a user-simple interface to straightforward BCP questions such as those that would be asked during a BIA, then conditionally navigates users through the survey and generates and dynamically renders a fully formatted and paginated BCP plan of up to several hundred pages in length.

The tool development process included these components:

- A set of 2,000 questions created in over 48,000 lines of XML code, with conditional paths that connect subsequent questions, as answer-appropriate.
- A core 150 page business continuity plan including up to 34 airport business and operating sections – with data insertion points and content "on" or "off" toggles integrated with each of the 2,000 survey questions.
- An entire survey application and GUI that conditionally presents the question flow in unique response to each user's answers, saves the answers, manages each user instance, generates in HTML format an on-screen plan based on users' answers, then converts it to a fully formatted and paginated PDF document – on the fly, within seconds.
- All of this is accomplished on almost any PC still in circulation, by novice users, who are not BCP-knowledgeable.

The software tool and construction tools comprise another 59,000 lines of XML, JavaScript, C++, C#, CSS, HTML and XSD code, and integrates key source code libraries:

- jQuery - underlying JavaScript/DOM support
- jsTree - GUI tree widget
- jsRender - template support
- tinyMCE - HTML WYSIWYG editor
- codeMagic - HTML editor
- javascriptMVC - base jQuery.Class support
- xmlDom (jquery plug-in) - integrate XML/jQuery/DOM
- openIcon library - opensource GUI icon support
- NODEjs - java script based web server framework
- Express - NodeJS HTML server support
- Deferred - NodeJS asynchronous event handling
- uberclass - NodeJS Class support
- TCLAP -- C++ Templated Command Line Parser
- hiQPDF – a licensed, HTML-to-PDF converter

The tool features instance management, cumulative "saving," complex bypass/return, color aided navigation status, "information" pop-ups, a progress bar, dynamic HTML document preview, and intelligent transformation to a PDF document output format.

(See a description of the software tool in Appendix H.)

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

Conclusions

ACRP 03-18 confirmed the premise behind the problem statement – that BCP is not well understood in the US airport community, is not widely practiced, and is mistakenly associated with emergency management, IROPS, or disaster recovery.

Project deliverables – the BCP guidebook and software tool – were written to assist non-technical users at every type of airport and FBO in understanding BCP and developing a BCP program, either on their own, or by using the software survey that was published with the guidebook.

If these tools are successful in helping airports mature from novices in BCP to successful BCP practitioners with a basic understanding of and appreciation for BCP, a working familiarity with the software, and the ability to develop the basic business continuity plan that these tools will generate – then the project will have helped upgrade an entire sector of US critical infrastructure to a reasonable first step in long-term operating resilience.

Recommendations

Promoting the Research and Supporting Industry Adoption of BCP

The research team believes that such a meaningful potential result should be optimally amplified by key industry organizations through their development of standards for airport BCP, programs to publicize and promote compliance with the standards, and a path to funding broad adoption at US airports.

The implementation of the research results should focus on industry-wide awareness of the products developed by the research team. Alongside the release of the guidebook and tool via the TRB site and CD ROM, the TRB might consider sponsoring demonstrations of tool at national ACI-NA and AAAE conferences. The TRB might also consider funding an awareness campaign in *Airport Business,* and sponsoring online "GoToMeeting" software demonstrations. It should consider funding for technical support of the software tool after it is published and released.

The DHS and FAA might consider collaborating to define BCP as an airport best practice, and to devise guidance on implementing BCP, including some mechanism to encourage and promote education and compliance. They might explore funding compliance through existing grant programs or as an official obligation in consideration of grant assurances.

Local and state governments that have not already done so could consider specifically including airports in their COOP requirements, pursuant to various presidential directives that have established the importance of the resilience of critical infrastructure.

Technical Support

While the ACRP 03-18 software tool was designed to be easy to use, intuitive and logical, it nevertheless automates an inherently complex BCP process for novice users. Because of this, the research team was concerned that it would require perhaps substantially more user support and technical support than other TRB software tools typically have required. However, the scope of work on ACRP 03-18 omitted a provision for technical and user support, which may potentially frustrate airports that need assistance.

Without funding, the research team cannot commit to providing such support for hundreds or thousands of airports. The result may include calls for help made to the TRB or to members of the research team, which the former is not in the position to provide, and the latter cannot afford to provide without reasonable compensation.

We recommend that, for projects that include sophisticated deliverables such as the 03-18 BCP software tool, the TRB consider add-on sole source funding for research teams whose deliverables may imply the need for active user support, in order for airports to receive full benefit from these tools and resources.

Further Research Indications

Work on ACRP 03-18 suggests several additional areas that may be valuable for further related research that the TRB might fund:

Telephone and Online Help Desk

A software tool of this level of sophistication should include a TRB-funded help desk, to help airports navigate the complexities of BCP and to help them with installation and functional issues that might arise across the wide and undefined universe of possible computers that users may use to host the application. TRB processes should accommodate this kind of problem definition as a sole source project, because only the software author is in the realistic position of knowledge required to provide such support.

Mac Support

ACRP 03-18 was not funded sufficiently for the research team to develop support for the growing population of Apple Mac computers. The team is aware, through comments from Panel members, that this might be an enthusiastically received new feature of the software if it were to become a newly funded research topic.

Online Distribution is a Critical Improvement

The TRB should consider that its restriction - that software developed as part of its research projects cannot require any paid subscription or license – meant that the BCP software created in ACRP 03-18 could not be developed as a hosted online application. That considerably restricts the ease of access and use at a time when it can reasonably be assumed that a great majority – if not all – airports have pre-existing Internet access.

Developing a follow-on problem statement that results in a project specifically funded to accomplish online availability of this tool would resolve all critical outstanding issues:

- Current absence of technical support for the locally-installed product would be far easier and less expensive to provide.
- The single-user/single computer issue would be resolved with airport-specific multiple user management.
- Macs would not be omitted in an Internet-hosted application, making the tool available to far more airport users.
- A single online application would be easy to constantly improve and update, where the current format is not.
- With an Internet-hosted application, the research team would be able to provide the TRB with regular reports about how the software is being used by airports, and generate valuable usage data analysis that would indicate precisely how useful and effective the tool is.

Amending TRB Timetable and Funding Process

The research team suffered negative financial impact by electing to develop a far better set of deliverables than the original project funding supported. The decision by the team to develop this advanced software deliverable for ACRP 03-18 – informed by our research - demonstrated the need for a TRB process for amending scope-of-work definition and funding levels with an enhanced timeline and mechanism for additional funding, when the circumstances support such an enhanced approach.

APPENDIX A – BCP Definition and Justification

Definition

Business continuity planning is the process of developing a roadmap for continuing airport and FBO operations under adverse conditions and during disruptions caused by all types of incidents, emergencies and crises. BCP is a process or methodology that documents how business is conducted *during* these disruptions, and how essential functions, processes and resources are optimally recovered and restored *after* the disruption. BCP focuses on recovering data, information and processes in every airport function. It is a holistic process that should be applied across the business and operations footprint of the entire airport.

Airports and FBOs that "have business continuity" are those that have rigorously embraced the business continuity planning process, developed a "living" business continuity plan, adopted a business continuity mindset and discipline throughout the enterprise, and that regularly exercise and update their plans.

What BCP is Not

BCP is very distinct from other emergency-related programs and processes in the airport environment, even through some of these other processes may be tangentially related to business continuity. The distinctions among these other processes and their relationships with BCP are described below:

Emergency Management

Emergency management is the process of preventing controllable incidents that threaten life, property and physical assets; mitigating the impact of incidents that actually occur; responding to these incidents; and physically recovering from them. Emergency management is incident-specific and deals with all types of risks, hazards, and emergencies - both natural and man-made.

Disruptions to airport operations may well be caused by emergency incidents. Unlike emergency management, however, BCP is not concerned with the type of incident or emergency that __causes__ disruptions or with the likelihood of its occurrence. The focus of BCP is on the __impact__ of such an emergency incident on the continuity and resilience of the essential functions and processes that comprise the regular, routine operations of the airport or FBO. The kinds of resources used to respond to emergencies are very different than those used to recover business operations.

Information Technology Disaster Recovery

The information technology department's (IT) Disaster Recovery (DR) plan addresses how technology infrastructure, applications and resources will be optimally recovered after disruptions, and in what order these elements will be restored in order to support the business requirements of the airport or FBO.

The IT Disaster Recovery plan is a component part of a comprehensive business continuity planning process. Optimally, DR plans are aligned with the business continuity plan through the business impact analysis (BIA). This analysis assigns relative recovery priority to all business and operational functions. In turn, the BIA defines the demand for the recovery of IT support for those most critical functions. The BIA ranks the priority of business functions for IT resources through two measures - the tolerance each function has for loss of technology, and the amount of time these functions can be unavailable to the airport before there is material negative impact to their mission and to the airport.

Crisis Management

Crisis management consists of methods used to respond to both the reality and perception of a crisis, establishing metrics to define what scenarios constitute a crisis and should therefore trigger the necessary response mechanisms, and the communications that occur within the response phase of emergency management scenarios.

Crisis management is the strategic overlay to how airport organizations think about and deal with critical incidents that can affect operations, regulatory assurances, financial performance, reputation, and legal circumstances. BCP plays the role as a component of the crisis management strategy – specifically dealing with the resilience of essential functions during crises that cause disruptions and the recovery of these functions after the crisis passes.

Irregular Operations (IROPS)

IROPS are events that disrupt normal flight schedules, causing problems for airports, airlines, and passengers. IROPS are usually caused by extreme weather conditions or mechanical issues, and they can vary widely among airports. Negative impacts can include tarmac delays, passenger surges in terminals and extended stays in airports. Creating a comprehensive contingency plan helps airports comply with new government regulations and improve overall customer service during IROPS events.

BCP addresses how to recover and restore normal airport operations after a material disruption of any kind. "Normal operations" refers to how the airport routinely runs its myriad operations when the <u>operating environment is stable</u>. IROPS, on the other hand, encompasses airports' contingency plans during the <u>abnormal circumstances</u> in the

aviation system and with air carriers that impact passengers at the airport. IROPS are operations during times when the systemic air traffic environment is fundamentally in chaos.

The Transportation Research Board's (TRB) "Airport Cooperative Research Program (ACRP) Report 65: Guidebook for Airport Irregular Operations (IROPS) Contingency Planning" is available to guide airports in developing, continually evaluating, and updating their contingency plans and procedures during irregular operations periods that may cause significant disruptions to the travelling public.

Disaster Operating Groups

Disaster operating groups (DOGs) are regional airport-to-airport voluntary mutual aid compacts that offer operational assistance during large scale disasters. These groups are designed to offer effective airport-centric response to specific relief, operational, technical and logistic support during disasters. Response may include the cooperative provision of services such as:

- liaison,
- needs assessment,
- skilled personnel,
- relief services,
- specialized equipment,
- basics (food, water, personal needs, fuel trucks, AVGAS, Jet A fuel),
- airfield equipment (regulators, generators, lighting and signage),
- public safety items such as law enforcement officer (LEO) & Aircraft Rescue and Firefighting (ARFF) personnel, and equipment,
- assessment and advisory teams, and
- shared emergency operations center (EOC) facilities to coordinate relief efforts.

Disaster operating groups, such as SEADOG and WESTDOG, are essentially emergency management cooperatives that recognize that airports may be best equipped to help other airports respond to large scale regional scale crises like hurricanes. They can play an important business continuity role in that they provide potential alternative resources to support operational continuity for some airport activities until the affected airport can recover its own capacity.

Why Initiate Business Continuity Planning at Airports?

Airports and FBOs may implement a business continuity planning program for a variety of important reasons, both proactive and defensive:

Good Business Practice

Good Strategy

Recognizing that business continuity planning is strategically important at the airport as a risk management imperative is perhaps the best reason to initiate BCP. As federally certificated transportation and commercial centers serving and supporting local and regional economies to the public good, airports' strategic plans should include the capacity and capability to provide continuous operations in the service of their stakeholders.

Risk Management

Business continuity is a natural adjunct to airport enterprise risk management (ERM) and insurance programs because it documents risk mitigation efforts that the airport has adopted. BCP can help airports quantify the economic cost of business interruptions so they can understand, document and plan for the impact in terms of lost revenue, contractual or regulatory penalties or contingent cost implications. Airports are organizations that may be exposed to enhanced operational continuity risk because many of their operating and intellectual assets are concentrated in a single physical location with severely limited or non-existent relocation options.

Contractual Obligations

BCP may also help airports meet service level agreements (SLAs) and contractual obligations to their business partners, and to comply with loan or funding covenants. Airline lessees may require the development of a business continuity plan by the airport as a condition to, or pre-requisite for locating or continuing flight operations there – or they may want to coordinate their airline-specific contingency plans with those of the airport. Airports depend on complex supply chains – symbiotic networks of vendors, contractors, lessees and concessionaires - for their mission-critical services, resources and capacity. They should be motivated to establish BCP programs to address the operational resilience of each of these partners, in order to mitigate single points of failure in their integrated networks and to help their partners meet their own continuity objectives.

Compliance

Regulation and Oversight

Airports must comply with numerous federal, state and local regulations, directives, rules and oversight., which may directly or indirectly obligate them to implement BCP. Many states have statutes requiring departments, agencies and other arms of government to comply with continuity of operations planning (COOP) directives for sustainability. To the extent that airports are considered government entities, these COOP directives may require BCP at airports in their jurisdictions. Indirectly, compliance with specific FAA

certification requirements (such as maintaining ARFF Index levels) may be enhanced with thorough business continuity planning.

Industry Standards

Whether airports develop business continuity plans for business reasons or to comply with governmental mandates, there is a body of standards that have been developed and widely adopted that define minimum practice. Government COOP mandates usually reference these standards; a voluntary BCP compliance program of the US Department of Homeland Security aligns with them; and many industry-leading practices are consistent with them. *These standards are more fully described in Appendix A.*

Liability Management

Airports and FBOs may adopt business continuity planning as a mechanism to support their efforts to limit their (or the port authority's, city's, or county's) exposure to liability for claims, lawsuits, and contractual penalties related to operational losses.

APPENDIX B - Conference Research Results

AAAE Basics of Airport Law Workshop

This workshop helped us understand the definitions of airport "players" and airport, FBO and SASO types. It covered the role of General Aviation airports in connecting small and rural communities and economies to the world and supporting specialized functions including medical evacuation, law enforcement interjection, fire suppression, and recreation. It dealt in detail with airport leases and contracts with lessees, and with FAA Grant Assurances and deed restrictions.

American Association of Airport Executives (AAAE) General Aviation Issues and Security Conference

This conference helped us appreciate the major issues facing the GA airport community, especially from the perspective of economic viability.

AAAE Large Hub Winter Operations Conference

At this conference, we observed and heard about the considerable and impressive efforts and initiatives being undertaken among the FAA, airport management and carriers to pro-actively collaborate before winter weather incidents bring flight and airport operations to a standstill.

Airports Council International – North America (ACI-NA) Small Airports Conference

Airports' role as businesses that must be self-sustaining or generate a profit to their municipality or county was a key theme at this conference, especially from the perspective of activities outside the realm of flight operations that can generate cash flow and render the airport a destination for activities other than purely aviation operations.

ACI-NA Insurance and Risk Management Committee Meeting

At this meeting, the Committee confirmed all of the mid-project research findings that we presented, and agreed that the airports they represented do not understand business continuity well. These Risk Managers see a huge upside from an enterprise risk management and insurance perspective for their airports if senior airport management will take seriously the deliverables that are generated by this project – the guidebook and tool – and make business continuity a priority. Understanding their airports' fiscal challenges, they were intrigued that federal grant funds might be available to this end.

AAAE National Airports Conference

Because Spencer Dickerson of the AAAE announced ACRP 03-18 from the podium and pointed out the researcher present at this conference, it generated a significant number of impromptu conversations about the project, many of which led to airport participation. Those that agreed to join the project were open and interested in learning about business continuity and having access to a tool that will help them understand it and how they can proceed.

Airport Ground Transportation Association ("AGTA") Fall Meeting

At this meeting, we discussed how very few Ground Transportation providers have Business Continuity plans. Several types of challenges at airports for these operators – such as road airport construction, signage issues, and the technology involved with fleet and transport management (GPS, Vehicle ID readers - "EZPass type" to show where vehicles are and how many are available at any given time) have implications for airports' own business continuity strategies. BCP is essentially beyond the scope of many of these operators. Nevertheless, all want to be included and become knowledgeable in the airport BC Plans so they can respond properly.

ACI-NA Annual Conference

This conference had as one of its focuses how to make the airports more stable and financially viable. Among the most cited obstacles to this were:
- How increased load factors puts pressure on airports to be operationally efficient and be able to accommodate delays in the terminal.
- How airline auxiliary charges have, in some instances, caused a ripple effect on airport operations (e.g. more carry-on bags, more food being purchased for on board) and potentially have business continuity implications.
- How the absence of risk-based security can cost an enormous amount of time and effort and can perpetuate delays in passenger and luggage processing resulting in a negative passenger experience at the airport.
- How the financial viability of airports is predicated, in part, in:
  - Better Passenger Experience – Increasing comfort to customers, decreasing cost to airlines.
  - Increases in non-aeronautical revenue – Providing an experience for the customer that is more than just "waiting for an airplane," and developing airport-as-a-destination services in shopping, dining, amusement, etc.
  - Technology, technology, technology – websites, mobile applications, displays, customer services, flight status texts, weather, etc.

ACI-NA Airport Concessions Conference

This conference introduced several concepts with interesting implications for business continuity planning:

- Leasing airport property to build non-terminal concessions that offer "civilian" prices at the airport, as a more cost-responsible alternative to premium-priced in-terminal concessions.
- For rapid and dramatic changes in traffic (e.g. Olympics), accommodating roll-around kiosks enables airports to respond quickly to changing demands.
- With fewer airline meals, passengers in the secure area are choosing stations selling pre-packaged carry rather than food from sit-down restaurants.
- The airports that were winning concession awards had in common:
    - Lots of natural light through windows
    - Large video displays providing information other than airline schedules
    - Significant advertising revenue opportunities from providers of traveler comfort and services

APPENDIX C - Airports Surveyed

Location ID	City	State	Airport Name	Name	CY'09 Enplanements or Cargo Landed Wt (lbs)	Category
DFW	Fort Worth	TX	Dallas/Fort Worth International	Alan Black, VP Public Safety	26,663,984	Large Hub
				Jim Crites, EVP Operations		
JFK	New York	NY	John F Kennedy International	Robert Junge, Manager of Airport Operations	22,710,272	
SLC	Salt Lake City	UT	Salt Lake City International	Alvin Stuart, Superintendent Of Airport Operations	9,903,821	
DCA	Arlington	VA	Ronald Reagan Washington National	Margaret McKeough, EVP and COO at Metropolitan Washington Airport Authority	8,490,288	
DEN	Denver	CO	Denver International	Claudia Chavez, Risk and Crisis Manager	24,005,992	

Location ID	City	State	Airport Name	Name	CY'09 Enplanements or Cargo Landed Wt (lbs)	Category
CVG	Cincinnati	KY	Cincinnati/Northern Kentucky International	Gary Peters, Internal Auditor	5,194,214	Medium Hub
MSY	Metairie	LA	Louis Armstrong New Orleans International	Michelle Wilcut, PIO and Board Secretary	3,916,746	
SAT	San Antonio	TX	San Antonio International	Ellen Erenbaum, Finance & Administration	3,791,928	
RNO	Reno	NV	Reno/Tahoe International	Marily Mora, EVP and COO	1,828,818	

Location ID	City	State	Airport Name	Name	CY'09 Enplanements or Cargo Landed Wt (lbs)	Category
SAV	Savannah	GA	Savannah/Hilton Head International	John Rauback, Director Of Finance & Administration	799,066	Small Hub
				Greg Kelly, Asst. Exec. Dir of Savannah Airport Commission		
MLI	Moline	IL	Quad City International	Bryan Johnson, Director of Operations	461,888	
ILM	Wilmington	NC	Wilmington International	Jon Rosborough, Airport Director	400,526	

Location ID	City	State	Airport Name	Name	CY'09 Enplanements or Cargo Landed Wt (lbs)	Category
JNU	Juneau	AK	Juneau International	Jeannie Johnson, Airport Manager	287,924	Non Hub
FWA	Fort Wayne	IN	Fort Wayne International	Scott Hinderman, Director of Operations and Facilities	259,315	
EVV	Evansville	IN	Evansville Regional	Doug Joest, Interim Airport Manager and Finance & Administration	153,993	
GFK	Grand Forks	ND	Grand Forks International	Patrick Dame, Executive Director	97,361	

Location ID	City	State	Airport Name	Name	CY'09 Enplanements or Cargo Landed Wt (lbs)	Category
SAF	Santa Fe	NM	Santa Fe Municipal	Jim Montman, Airport Manager	9,767	Commercial Service
BID	Block Island	RI	Block Island State	Mark Helmboldt, Airport Manager	8,516	

Location ID	City	State	Airport Name	Name	CY'09 Enplanements or Cargo Landed Wt (lbs)	Category
OSU	Columbus	OH	Ohio State University	Matthew Baldwin, Business Continuity Coordinator	28	General Aviation
VNY	Van Nuys	CA	Van Nuys	William Ramirez (Emergency Planning) and Flora Margheritis (Operations Chief)	1,134	
CHD	Chandler	AZ	Chandler Municipal	Greg Chenoweth, Airport Manager	119	
FXE	Fort Lauderdale	FL	Fort Lauderdale Executive Airport	Clara Bennett, Airport Manager	132	
RVS	Tulsa	OK	Richard Lloyd Jones Airport	Steven Mushrush, Airport Manager	19	
BFI	Seattle	WA	Boeing Field - King County Airport	Robert Burke, Airport Div. Director	35,863	

Location ID	City	State	Airport Name	Name	CY'09 Enplanements or Cargo Landed Wt (lbs)	Category
TEB	Teterboro	NJ	Teterboro	Pam Phillips, Manager, Operations and Security	6,447	Reliever
ORH	Worcester	MA	Worcester Regional	Andy Davis, Airport Director	17,241	
ALN	Alton	IL	St Louis Regional	David Miller, Airport Manager	23	

Location ID	City	State	Airport Name	Name	CY'09 Enplanements or Cargo Landed Wt (lbs)	Category
SDF	Louisville	KY	Louisville International	Skip Miller, Airport Director	10,278,035,711	Cargo
MEM	Memphis	TN	Memphis-Shelby County Airport	John Greaud, VP Operations	18,928,729,202	
MIA	Miami	FL	Miami International	Manny Gonzales, Business Retention & Development	6,352,786,009	
PHX	Phoenix	AZ	Sky Harbor International	Carl Newman, Asst. Aviation Director	1,220,692,246	

Location ID	City	State	Airline Name	Name	CY'09 Enplanements or Cargo Landed Wt (lbs)	Category
N/A	Atlanta	GA	UPS	Kathy McHargue, IT Manager and BCP Lead	N/A	Airline
N/A	Atlanta	GA	Delta/NW Airlines	Bryan Reiter, Managing Director of Airport Customer Services Stations	N/A	
N/A	Queens	NY	Jet Blue	Lee Garvin, Risk Manager and Business Continuity Planning	N/A	

Location ID	City	State	FBO Name	Name	CY'09 Enplanements or Cargo Landed Wt (lbs)	Category
N/A	Orlando	FL	Signature Flight Support	Patrick Moylan, Dir. Health, Safety and Environment	N/A	
N/A	Teterboro	NJ	Jet Aviation	John Langevin, SVP & GM	N/A	
N/A	Nashville	TN	Central Parking Systems	Steve McCormick, VP Airports	N/A	
N/A	Charlottesville	VA	Meridian Air Group	Steven Walters, President & Director of Operations	N/A	FBOs
N/A	Houston	TX	Landmark Aviation	Ted Hamilton, EVP Operations	N/A	
N/A	Fort Lauderdale	FL	Shelt Air	Daniel Walsh, COO of FBO Division	N/A	
N/A	Van Nuys	CA	Clay Lacy Aviation	Bill Staunton, CFO	N/A	

Table 1. *Airport participants in BCAP Survey*

APPENDIX D - BCAP Questionnaire

BCP PROGRAM REVIEW			

1. ORGANIZATION & STRUCTURE (32 Questions)

1.1.SENIOR MANAGEMENT COMMITMENT (11 Questions)

Control Number	Management Practice Questions	Response	Recommendation
1.1.1	Does Senior Airport Management and Audit annually review and approve the Airport Business Continuity Plan, including the scope of the plan, plan testing and frequency and test results?		**Create and implement a Senior Airport Management-level annual review process of the Business Continuity Program.** Airport Management is responsible to the stakeholders for the ongoing performance of the airport operations and should approve key elements of the business continuity program. The approval process should include the scope of the program, the frequency of testing and the test results. Plan scope should be thoroughly reviewed before approval
1.1.2	Has senior airport leadership published a policy statement indicating its commitment to BCP?		**Develop and widely distribute an Airport Business Continuity Policy Statement signed by the Senior Airport Leadership Team.** Senior airport leadership should approve a policy statement to provide guidance on how to implement business continuity mandates. Create an airport organizational policy that addresses how all the business and operations units are required to address business continuity issues.
1.1.3	Is airport leadership evaluated based on compliance to the BCP policy statement?		**Create and implement performance metrics for senior and middle airport leadership based on level of compliance with BCP policy.** Airport leadership personnel should have incorporated in their performance metrics a measure for adherence to the business continuity policies and procedures.
1.1.4	Are suppliers and vendors required to comply with the Airport BCP policy statement?		**Require vendors to comply with the BCP Policy as part of standard contract terms and conditions.** Sole-source, and other vendor relationships in many cases represent single points of failure to the business and operations units or the whole airport operation. Any potential disruption of supplies or services could adversely impact the financial and/or operational aspects of the airport.
1.1.5	Does senior airport leadership annually approve the incident management model of the BCP Program?		**Develop and implement a standardized component review requiring senior airport leadership approval as part of the annual BCP Program Review.** Senior airport leadership is responsible for the airport's ability to recover from an interruption. Senior airport leadership should annually approve the incident management model.
1.1.6	Does senior airport leadership annually approve the airport's recovery priorities, the BIA results of the BCP program and Senior Airport Management Support of the BCP plan in the BCP Program ?		**Develop and implement a standard component review requiring the airport management approval process as part of the annual BCP Program Review.** Senior airport leadership is responsible for the airport's ability to recover from a business or operational interruption. Airport Management should annually approve the major components of the BCP. Some components warranting annual approval include: 1) the incident management model; 2) airport recovery priorities; 3) the senior airport management support plan; 4) business and operations units/processes to be included in the program; and 5) the results of the business impact analysis. Approval can take the form of a written document or it can appear in meeting minutes.

1.1.7	Does senior airport leadership annually approve the business units/processes to be included in the BCP Program and the BIA results in the BCP program?		**Develop and implement a standardized component review requiring the airport leadership approval process as part of the annual BCP Program Review.** Senior airport leadership is responsible for the airport's ability to recover from a business or operations interruption. Airport Leadership should annually approve the business and operations units/processes to be included in the program and the BIA impact in the BCP program. Approval can take the form of a written document or it can appear in meeting minutes.
1.1.8	Have senior airport leadership roles and responsibilities been identified and documented and the appropriate members trained for their particular role in the incident leadership model?		**Document airport leadership roles and responsibilities and implement initial and annual refresher training for senior business and operations managers throughout the airport.** It is important senior business and operations managers and their direct reports know their roles and responsibilities in a situation in which the BCP would be implemented. The impact of business or operations interruptions is compounded when leadership does not act according to their defined scope of responsibility.
1.1.9	Has senior airport leadership appointed a leadership group/person to oversee the development and implementation of the business continuity program?		**Designate a responsible individual with authority to develop and implement a program for Airport Business Continuity Management.** There is a significant risk that effective plans cannot be developed without the active support of senior airport management. Senior airport management, preferably the Executive Committee, should designate a multidisciplinary team responsible for development and implementation of the business continuity program. Airport Management should also consider assigning a senior manager, empowered with the executive responsibility for the business continuity program to maintain focus and apply appropriate resources.
1.1.10	Is the senior airport leadership sponsor involved in the BCP program on a periodic (minimum) basis?		**Designate a Senior Airport Leadership sponsor for the Business Continuity Program.** A senior manager who does not actively participate in the business continuity program will not be able to provide adequate support for key recovery related initiatives. Develop an appropriate schedule for involvement, including specific triggers that mandate senior management input and/or review.
1.1.11	Does airport leadership mandate an annual risk assessment?		**Implement an annual Risk Assessment Process.** The Risk Assessment will help airport leadership identify scenario exposures/risks (i.e. events that could impact the location of the business or operations or processing centers). In many areas where exposures exist, controls may be implemented to mitigate the impact of the threats. Airport Leadership may decide to accept certain exposures given the likelihood and weight of impact of the threat on the business or operations and/or the cost of implementing additional controls. Airport Management should also consider new threats and scenarios as the environment changes to accommodate for appropriate response mechanisms.
1.2. BCP OBJECTIVES (2 Questions)			
1.2.1	Are the BCP program objectives documented, measurable, realistic and achievable, based on aviation industry standards/regulations and integrated into the Airport Strategic Operations Plan?		**Document the Business Continuity Program Objectives as determined by the Senior Airport Leadership Team.** The Business continuity program objectives help to document and implement senior airport leadership's mission statement on BCP. BCP objectives are not the same as recovery priorities. They are the operational targets, updated periodically, to help make the overall program successful. Develop significant, measurable, and attainable program objectives, integrated with airport strategic objectives, that address the airport industry and current/future regulatory environment.
1.2.2	Are individual members of the Airport Leadership Team obligated and accountable for results and success of each objective and in liaison with the BCP Program Coordinator re their ongoing status?		**Individual members of the Airport Leadership Team should be obligated and committed to successful achievement of individual objectives and liase with the BCP Program Coordinator re any changes or updates.** Airport Leadership Team Members must be accountable for individual objectives should create an Action Plan for successful completion of each objective. The Action Plans should be updated regularly and copied to the BCP Program Coordinator to allow BCP Plan modification as needed.

1.3. BCP PROGRAM RESOURCES (3 Questions)			
1.3.1	Is there an airport BCP program coordinator who is empowered to make significant decisions about the program and who is accountable for the results of the BCP program? Is this role clearly documented and understood?		**Designate a responsible individual with accountability and authority to develop and implement a program for Airport Business Continuity Management.** Document the recovery organization and the associated names with the various team leader roles and responsibilities. The airport management must identify who is the point person for all BCP issues. A business continuity program should be treated like any other major company airport initiative. This includes creating objectives and holding the airport BCP coordinator accountable to them. Business continuity interacts with every area of the airport's operations organization, and it is possible for the duties of a BCP coordinator to be mis-aligned or mis-communicated. The BCP Coordinator's responsibility is to manage and coordinate the response to, and recovery from, a crisis. This role will continue through the restoration until the situation returns to normal. The Coordinator's key roles and responsibilities are to: - Select/Activate the Airport BCP Emergency Operations Center - Direct information gathering - Project manage the recovery - Ensure delegated tasks are completed - Communicate and coordinate with Business and Operations Recovery Teams The Coordinator is a project manager and a decision-maker, who oversees and directs recovery efforts and tasks focusing on the coordination and airport management role. This function involves gathering relevant information and options from the various teams to enable accurate decision-making.
1.3.2	Is there a designated BCP representative within each airport business and operations unit?		**Designate a BCP representative for each business and operations unit to ~~liaison~~ liase with the airport BCP Program coordinator.** A successful program requires each business unit to have input into the contents of the BCP in order to make the plan comprehensive and dynamic. Airport Management should select and designate individuals with appropriate knowledge and authority to accurately represent their unit.
1.3.3	Is a process in place to determine resources (internal, external, and budget) required for ongoing airport BCP program success?		**Implement a process to identify required resources to support ongoing Airport Business Continuity Management, and include into the staffing and budget development and approval processes.** A BCP program requires a budget and dedicated staffing to ensure that the objectives can be met within the assigned timeframes. Airport Management should also consider situations where external vendors, business partners, and consultants may be needed to meet shortfalls due to peak periods of key program activities. Additionally, airport management should identify where additional airport-wide organizational headcount could be engaged to make up for staffing shortfalls during periods of increased manual workarounds (i.e.: systems downtime).
1.4. RECOVERY ORGANIZATION / TEAMS (3 Questions)			
1.4.1	Is there a formal airport BCP organization consisting of designated personnel and recovery teams?		**Create a formal airport BCP organization that includes a Steering Committee, a Damage Assessment Team, a Senior Airport Management Support Team, Business, Operations and Technical Recovery Teams.** Detailed roles and responsibilities for the airport recovery organization provide a framework for successful plan development and implementation. In developing and maintaining an effective and efficient business resumption capability, leadership roles should be defined. This group has the responsibility for strategic guidance during the recovery efforts and the allocation of resources. The responsibility for evaluating and making decisions as to the deployment of recovery resources should consist of senior airport, business and operations managers representing IT, business operations, finance, and operations functions. Clearly defining who is authorized to declare a state of disaster and who will be authorized to rescind it will aid in the rapid establishment of the EOC (Emergency Operations Center) and implementation of recovery activities.

| 1.4.2 | Is there a distinct airport technology recovery team, a business process recovery team, a distinct airport management support team and a distinct airport damage assessment team? | | **Create an Airport Technology Recovery Team, Business Recovery Team, Airport management Support team and Airport Damage Assessment Team.**

These team are responsible for providing technical recovery of systems, platforms, data, networks and applications, recovery of business/operations, management Support and Damage Assessment. ~~These~~ Teams are responsible for: verifying that applications are functioning properly, ensuring user connectivity and providing business/operations recovery services At a high-level the teams will:

Oversee the technical damage assessment throughout the airport;
Determine the system recovery priorities based on damage assessment; and
Locate, acquire and restore hardware and software as needed for continued airport operation.
Airport Business Recovery Teams are responsible for maintaining business operations while minimizing any adverse publicity, and negative client customer service and financial impacts. These teams are responsible for communicating with the Airport BCP Coordinator and initiating recovery tasks as indicated in their documented plans; Management Support - Teams consist of members of each of business and operations unit responsible for recovery of key business and operations processes and, if necessary the evacuation of the site and relocation |
| 1.4.3 | Are the roles and responsibilities of the various airport recovery teams and their joint relationships clearly defined? | | **Define and document the roles and responsibilities for the Airport Recovery Teams and the relationships and joint accountabilities among various Airport Recovery Teams.**

The individual teams need to focus on their specific roles and responsibilities to ensure that an efficient recovery is implemented. Strong relationships and effective communication between the various airport recovery teams are an integral part to a successful recovery effort. It is important for each team to understand the overall airport recovery strategy and appreciate what other teams are doing. The Airport BCP Coordinator is responsible for acting as the agent for this integration, communicating information on a regular basis to prevent a silo approach to the recovery of the airport as a whole. |

1.5 DOCUMENTATION PROTOCOL (3 Questions)

1.5.1	Is there a central repository for airport BCP related documentation?		**Create a secure database, directory tree, and intranet site or software repository for airport BCP documentation.** A central repository allows for document control, security and maintenance.
1.5.2	Have all Airport BCP plan components been identified and integrated to ensure a successful implementation?		**Airport Management should ensure that all plan components have been identified and leveraged to ensure a non-siloed and complete airport recovery effort.** BCP plans include many components — evacuation plans, business/operations relocation plans, technology plans, manual workarounds, data restoration plans, etc. — that need to be leveraged to create an effective airport-wide plan for recovery.
1.5.3	Are plan component documents consistent when referencing common procedures?		**Develop consistent nomenclature and reference procedures with all Airport BCP documentation.** Provide standard definition of terms where necessary for clarification and in a consistent format. A consistent approach to referencing procedures or defining nomenclature ensures a level ground for developing and implementing recovery plans.

1.6 ESCALATION & EXECUTION (5 Questions)

1.6.1	Are there clearly defined thresholds to guide the escalation sequence and trigger recovery activities across the airport operation?		**Develop and document disaster threshold levels and action triggers.** Disaster declaration, evacuation, damage assessment, emergency response, and off-site storage and retrieval procedures must be documented in all airport BC plans. All procedures must provide sufficient detail to be carried out and tested. Business and operations units must identify specific prioritized activities for the recovery of all critical business and operations functions across the airport operation.
1.6.2	Are formal, documented procedures in place to guide the escalation and implementation of the airport's IT recovery strategies?		**Develop and document an Airport IT Systems Disaster Escalation Procedure.** When a crisis situation arises, the designated point person based on the situation (i.e., systems issues - contact the Senior Airport IT Manager), must be informed immediately. That person then takes steps to evaluate the situation with the assistance of other team members where necessary. Based on the disaster criteria, the steering committee or crisis mgmt team either declares a disaster or arranges for the correction of the problem and resumption of normal processing. It is essential that proper call chain procedures are documented and followed. Effective communications play a vital role in the recovery effort.
1.6.3	Are the recovery strategies coordinated and integrated across all airport departments, business and operations units, divisions, etc.?		**Develop and implement a process to coordinate recovery strategies across all airport operations, departments and functions.** A business continuity plan recovers business and operations processes. The identification of cross business unit processes, intra and inter office dependencies (the supply chain) is essential to a successful recovery. Airport Management should ensure that all airport recovery strategies leverage the business and operations process recovery strategies to ensure ~~corporate~~ airport recovery plan objectives are met.
1.6.4	Do the response programs include physical and logical airport security requirements?		**Complete a Security Needs Assessment and incorporate findings into the Airport BCP Incident Management model.** Awareness of physical and logical security threats to your airport infrastructure and having them tied to your Airport BCP program is critical to your airport incident management model. Airport Management should ensure that ~~the~~ security and information security areas ~~of~~ across the airport are tied into the BCP process.
1.6.5	Are administrative personnel and associated resources identified and documented in the plan to ensure airport recovery strategies are properly supported?		**Document the roles and responsibilities of administrative support for the airport recovery efforts.** Administrative resources are required to facilitate recovery needs for such activities as supplies fulfillment and documentation of actions taken (minutes).

1.7 BCP PROGRAM AWARENESS (5 Questions)

| 1.7.1 | Is there a formally documented training and awareness schedule for all concerned airport employees? | | **Establish an Airport-wide Business Continuity Awareness and Training Program.**

Procedures must be established for informing airport personnel about business and operations continuation planning, their individual responsibilities and for keeping them current. Plan content and implementation must be fully understood by all airport personnel. Procedures should be developed to train all personnel in emergency response and notification procedures. Training in evacuation and the use of disaster prevention measures should be conducted. This should include notifying the proper emergency services, the Airport BCP Coordinator, and alternate contacts, and moving to the assembly location. Where necessary, recovery team members should also be trained in the timing and technical aspects of their tasks. Information should be presented to the recovery team leaders and alternates explaining the interaction of team activities and their relationship to the recovery of all critical business functions. The interdependence of various airport teams should be emphasized to create unity and to ensure a smooth recovery. For their personal safety, all employees should be aware of the appropriate response in a life threatening emergency situation. Personnel need to understand the interaction between recovery teams and how their specific responsibilities and tasks fit into the overall Airport BCP. For members of recovery teams, the majority of their training will be provided during plan testing. The members of critical business and operations teams should be prepared to complete their normal duties in other surroundings and with a minimum of required resources. |

1.7.2	Is Airport BCP addressed when conducting training for related disciplines (disaster recovery, risk management, security, etc.)?		**Identify inter-discipline "touch-points" and include them in Airport Training Programs.** All airport employees should be trained to understand how their particular disciplines are interrelated with Airport BCP. Where feasible, airport and business and operations management should incorporate airport BCP into existing training programs. For example, a discussion of how the escalation of a security related event might lead to a BCP implementation should be included in an information security training program.
1.7.3	Do airport bulletins include information and updates on the airport BCP program?		**Create an Airport-wide Business Continuity communication mechanism.** Airport Management should consider creating an airport-wide publication or periodic means of communication to foster airport BCP awareness throughout the airport. Communication reinforces the importance of BCP activities and employee responsibility and helps condition the appropriate response in times of crisis.
1.7.4	Do all airport employees understand the airport BCP program and how they can contribute to it?		**Develop employee quick reference procedures and conduct awareness training.** Documented procedures must be established for informing all airport employees and keeping them apprised of business continuation planning and their individual responsibilities. Airport Plan content and implementation must be fully understood by all airport units. All staff should know how to contact their local business unit BCP representative and the BCP coordinator.
1.7.5	Does the airport share information concerning its BCP with outside interests (airlines, suppliers, regulatory agencies, insurance companies, etc.)?		**Designate a single point of contact for external airport BCP inquiries.** Airport Management should have all requests for information on their state of readiness directed to one central liaison. Airport Management should have created and approved a single policy statement regarding the airport's state of readiness, and where appropriate, test with key external organizations eg. airlines, as needed.

2. BUSINESS IMPACT ANALYSIS (28 Questions)			
2.1.PROCESS MAPPING (3 Questions)			
2.1.1	Is there a formal procedure to identify time critical business and operational processes (process mapping) within the airport's operations ?		**Institute a defined methodology to identify and document airport operation critical business and operations processes and supporting resources.** The process should include the roll-out of a Business Impact Analysis to identify each entity's business unit's Recovery Time Objectives (RTO's), Critical resource requirements; and Processing interdependencies. The identified resources, and the time that these resources must be made available, define the parameters for the Business Continuity Plan (BCP), and ultimately drive the recovery priorities and the strategy for each airport business/operations unit.
2.1.2	Does the process mapping exercise involve all appropriate stakeholders (internal and external)?		**Conduct a brainstorming session to identify all stakeholders necessary for the process mapping exercise.** Airport business/operations units must address workflow interdependencies between their own function's processes and other business units and/or external sources. Internal and external business process interdependencies should be defined and documented for all critical business processes to ensure the entire process is both identified and can be recovered in keeping with the Airport BCP Plan.
2.1.3	Is the process mapping exercise and any corresponding assessment applied consistently across all airport departments, business and operations units, divisions, etc.?		**Develop and implement a consistent process mapping procedure across all airport departments, businesses and operations areas.** For each airport critical business function the airport management has identified, the business or operations unit should identify critical inputs associated with that function's processes. Inputs to a critical business process are sources of information or services received from internal airport business/operations units as well as external business partners/stakeholders that are necessary to perform key tasks (Inputs come in a variety of formats and include but are not limited to: paper, magnetic media, microfiche, electronic, reports, telephone calls, transmission feeds, mail, and faxes).
2.2 BUSINESS IMPACT ANALYSIS PROCESS (8 Questions)			
2.2.1	Has an Airport Business Impact Analysis been completed?		**Conduct an Airport Business Impact Analysis across all airport business and operations areas.** The purpose of a BIA is to identify the Recovery Time Objectives ("RTO") (the maximum tolerable time to recover critical business and operations functions and existing resources supporting each function). The BIA also includes resource requirements to meet the RTO so you can easily identify and fulfill your recovery needs. These may include: Staff; Desktops; PCs (stand-alone); Telephones and Fax Machines; Office Equipment & Supplies; Stationery & Forms; Applications and Hardware Platforms; Internal Networks; External Connectivity; Vital Records; and Dependencies (Internal airport business and operations Functions, External (business partners). Airport Management should gather through interview and document information on estimates of tangible or intangible costs associated with operations disruption (quantitative or qualitative assessments). Based on the knowledge of the airport objectives, it should be determined to include: - loss of customer goodwill; - loss of market share; - loss of information used to make strategic and operational decisions; - missed business opportunities; reduced cash flow control; and- other operational impacts? Management should identify the IT recovery timeframe for each of the critical applications / software packages identified by each critical function?

2.2.2	Is an airport BIA completed annually?		**Conduct an Airport Business Impact Assessment at least every year, or whenever significant operational changes occur.** The Airport BIA is used to facilitate the identification of various impacts and exposures resulting from a significant operational disruption. The process of considering financial, customer service, legal/regulatory, and operational impacts will enable the airport organization to assign a more accurate recovery time objective based on the importance of its business and operations functions within the airport and to justify potential contingency related expenditures. Impacts should be documented consistent with the approach that a disruption occurs at the worst possible time (worst-case scenario). The various units should consider peak operating times, workflow fluctuations, and the frequency of key reports (end of week, month, quarter). Any methodologies used to arrive at quantitative impacts must be included to support those amounts. For example, if a unit claims that a one day disruption would result in a financial impact of $50,000, the unit must provide the detail used to arrive at this amount, i.e., the number and type of transactions multiplied by the dollar amount per transaction. Airport Management should require all business and operations units to perform a business impact analysis (BIA) to evaluate the financial and non-financial impacts of a worst-case disaster scenario on each particular function.
2.2.3	Did the Airport BIA document more than IT applications?		**Expand the Airport Business Impact Analysis to include all airport resources affected beyond information technology.** An effective BIA will identify not only the RTO's, but additionally all the resources required by the business or operations unit to perform its critical activities. Those resources should include but are not limited to: Personnel, including the functions that each employee completes; Computer hardware and peripherals; Software, both application and systems; Networks and communications; Voice communications; Office space; Office and other equipment, including supplies related to that equipment; Supplies, business forms, and manuals; and Vital records necessary to continue critical airport operations after a disaster.
2.2.4	Are the impact metrics associated with the Airport BIA determined by senior leadership?		**Conduct a Senior Airport Leadership Team workshop to determine business impact metrics.** Airport Management should review and approve all airport recovery plans. The Airport Business Continuity Officer and the appropriate business unit management, operations & systems management, and the risk officers should also validate and understand the critical airport operation functions and their related recovery time objectives. The review process should consider all documented impact metrics that will be used to define the necessity to resume airport operation in a timely manner.

2.2.5	Did the Airport BIA consider multiple business or operational impact metrics other than financial metrics (intangible costs associated with business disruption (qualitative assessments) based on the knowledge of the operations		**Consider the range of impacts affecting viability of operations** Airport Management should consider business impacts such as financial impacts: include the loss of revenue resulting from termination or delays in airport operations or providing airport services, delays in collecting or investing cash receipts that result in a loss of income or increases in borrowings, loss of market share resulting in termination or delays to airport operations or providing airport services, and increases in expenditures to recover Critical Airport Operations. Customer Service Impacts include termination or reduction of meeting the requirements or expectations of our customers (including the effect on the public and airport image), for information about or support of operations and services provided by the airport. The level of impact (Low, Medium, High) may be associated to drivers that are specific to business and operations unit functions. The unit's degree of impact must be justified using business or operations unit performance drivers. In other words, after specifying the qualitative impact (i.e., "inability to service Customers"), to define the quantitative impact in terms of specific drivers (i.e., number of flight operations per day) that can be translated into a low, medium, or high impact to the airport. Units must also consider the consequences of not meeting the objectives outlined in any existing service level agreements. Legal & Regulatory Compliance Impacts include the potential for breaches of contract or failure to meet regulatory requirements (including the inability to maintain records in conformity with generally accepted accounting principles, and tax requirements or the inability to comply with court orders or applicable settlement or litigation agreements). It also means to (1) Explain the expected timing and exposure to increased legal liabilities; (2) Explain the range of potential damages, fines, and/or penalties; and (3) Identify and paraphrase the specific regulation being violated, how it applies, and the potential sanction.
2.2.6	Are roles and responsibilities associated with the Airport BIA process clearly documented and understood?		**Develop a consistent methodology and approach for the Business Impact Analysis process and implement it across the airport.** Develop policies and procedures for the Airport BIA process. A uniform approach to the rollout of a BIA tool for information gathering will ensure a level playing field for evaluating recovery priorities across the airport. Designated staff should be responsible for implementing the airport BIA and summarizing its results.
2.2.7	Is the Airport BIA process consistently applied across all departments, business and operations units, divisions, etc.?		**Develop a consistent methodology and approach for the Business Impact Analysis process, and implement across all airport processes.** A uniform approach to the rollout of a BIA tool for information gathering ensures a level playing field for evaluating recovery priorities across the airport. Designated staff should be responsible for implementing and summarizing the results of the Airport BIA.
2.2.8	Does the Airport BIA process provide the basis for the airport's operational interruption insurance program?		**Review insurance adequacy vis-a-vis the results of the Airport Business Impact Analysis.** Impacts associated with the BIA process should provide a basis for providing adequate insurance. Where feasible, airport management should quantify the loss due to an outage in order to justify loss potential and coverage requirements.

2.3 RECOVERY TIME OBJECTIVES (5 Questions)			
2.3.1	Has senior airport leadership established airport operations Recovery Time Objectives?		**Conduct an Airport Senior Leadership Team workshop to determine airport operations Recovery Time Objectives.** Airport Management should set specific objectives for recovery based on regulatory and market drivers that dictate recovery times. Recovery time objectives (RTO) should be developed for critical business and operations processes, and should be validated by senior airport leadership to ensure accuracy and uniformity.
2.3.2	Are the Airport Recovery Time Objectives aligned with the Airport BCP objectives?		**Map individual business and operations process Recovery Time Objectives (RTO's) to the airport recovery objectives defined by Senior Airport Leadership.** To ensure a common ground/goal for the allocation of recovery priorities and resources, business and operations units need to map their recovery objectives to the airport recovery objectives.
2.3.3	Have all airport process stakeholders established Recovery Time Objectives for their individual processes?		**Complete Business Impact Assessments of all airport business units to identify individual recovery time objectives and to determine criticality and resource requirements.** Without priorities based on critical impact, recovery plans may not adequately address recovery needs, establish appropriate priorities or limit financial loss.
2.3.4	Are the individual business/operational process Recovery Time Objectives (RTO's) aligned with the airport RTO's?		**Implement an Airport Business Impact Assessment process that aligns business and operations unit recovery objectives with airport strategic objectives.** Business and operations units need to be able to map their objectives for recovery to airport objectives. Airport Management should define the overall airport objectives for recovery. The individual business and operations processes should map their RTO's to the airport objectives, where applicable, to ensure there is a common ground/goal when allocating recovery resources.
2.3.5	Are all Recovery Time Objectives achievable based on internal and external conditions?		**Develop a plan to bridge the gap between current and required capability.** Airport Management should create a gap analysis to compare the RTO's of the business and operations units to the actual recovery abilities of the airport. Airport Management should ensure that, where possible, manual workarounds exist to fill the gap where the business process RTO exceeds the actual recovery time. Or, management can consider allocating resources to develop a shorter recovery time capability. Where the RTO is less than the actual recovery ability of the organization, strategically reallocating recovery resources should be considered.

2.4 RESOURCE REQUIREMENTS (11 Questions)			
2.4.1	Did the Airport BIA include an assessment of minimum resources required to recover operations within the specified recovery time objective (RTO)?		**Identify required resources for recovery operations.** Minimum recovery resources such as ATC, ILS, GPU's, runway, ramp and fuel availability, passenger and cargo ground transportation, ramp towing equipment, tugs, container loading lifts, belts, mobile stairs, critical personnel, IT resources, platforms, hardware, software, workspace requirements, telecommunications, and supplies must be identified by critical business and operations process and within required recovery time frames.
2.4.2	Have minimum personnel been documented for each phase of airport recovery?		**Identify required staffing and skill sets for recovery operations.** In a phased recovery approach, airport personnel are scheduled to arrive at different times based on the RTO. Not all personnel for every function may be needed immediately. Business and operations units should consider that their staffing requirements based on the time their facility may be inaccessible, or may be performed at an alternate site or time.
2.4.3	Have minimum office/administrative equipment (e.g. photocopier, fax, etc) requirements been documented for each phase of recovery?		**Identify required equipment for recovery operations.** An effective BIA will identify not only the RTO's, but additionally all the resources required by business and operations units to perform critical activities. Those resources should include but are not limited to: - Personnel, including the functions that each employee completes; - Computer hardware and peripherals; - Software, both application and systems; - Networks and communications; - Voice communications; - Office space; - Office and other equipment, including supplies related to that equipment; - Supplies, business forms, and manuals; and - Vital records necessary to run critical business operations Identifying the respective resource requirements will not automatically result in those resources being made available in a contingency situation - even if those resources have been communicated to the appropriate infrastructure providers.
2.4.4	Have minimum information technology resources been determined for each phase of the recovery?		**Identify required IT resources for airport recovery operations.** The resource needs of an airport business or operations unit change over time and should be considered when planning for a recovery. For a phased recovery where immediate, intermediate and long-term needs are identified, the BIA should identify: - Application name - Description - Application version/release - Date of last update - Hardware and peripheral device requirements - Communications requirements - Systems software requirements - Databases required - Libraries required - Any special forms and supplies used

2.4.5	Does an accurate inventory of airport IT applications and their requisite hardware/network exist?		**Inventory required airport IT resources for recovery operations.** Airport Recovery needs and requisite back-up procedures can not be fully understood and implemented without having a complete picture of the Airport IT environment. Airport Management should identify all the resources required and maintained by the business and operations units as to perform its their critical processing activities. Those resources should include but are not limited to: Applications, Platforms, Data, Hardware, and Shared Drives
2.4.6	Have minimum facility/floor space requirements been determined for each phase of recovery?		**Identify required space and facility specifications for recovery operations.** The airport recovery initiative must identify all computing, workspace and other resources required to support the airport's critical business functions based on a phased recovery over time. Business and operations unit's resources change based on the length of the outage and their RTO, so appropriate resources need to be staged for delivery.
2.4.7	Has minimum specialty equipment been determined for each phase of recovery for each airport business or operations unit?		**Identify equipment requirements and specifications.** Airport Management should identify and document by critical airport business or operations function, office, workspace, and special equipment requirements for operations under recovery conditions. For a phased recovery, where immediate, intermediate and long-term needs are identified, record: - EDP Equipment - Cell phones and Two-way Radios - Security machinery and equipment (Airport perimeter fences, gates and TSA :WTMD's, HHMD's, ETD, EDS's) - Number of standard operational workspaces required - Number and type of telephone lines (e.g., dedicated lines) - Collating equipment - Copiers, Scanners and paper - Phone and ATC recording devices - Date stamps (manual and electronic) - Mailroom equipment - Security requirements, including security over files, plans, financial records and other records (i.e., vaults, locking file cabinets, etc.) - Special storage requirements (eg. TSA and Emergency Response) - Cabinet requirements for filing, storage or other needs. - Stationery - including Bomb Threat Procedures, forms and contact information. - Other forms, noting any specific requirements - Suppliers, including contact names and emergency telephone numbers.
2.4.8	Have required vital records been documented for each business and operations unit for each phase of airport recovery?		**Identify all airport operation sensitive vital records, the location of originals, and the existence of duplicates.** Vital records must be identified, protected from destruction, and, where appropriate, copies stored off-site. The location of off-site storage should be such that it is unlikely a single event would destroy both the original and stored records. Procedures should be developed to ensure off-site records remain current. This standard does not replace or alter other record management policies for other vital or important records. In the context of business continuation, vital are those records necessary to continue business operations after a disaster. Although certain records may be required as a matter of policy or to comply with federal or state laws or regulations, these records may not be essential to the recovery of critical business functions and will, therefore, not be considered vital for Business Continuity purposes. A vital record may be in the form of paper, microfilm, electronic file, microfiche, videotape, optical disk, or another unique form. They may include such information as customer data, loan documents, debtor information, creditor information, contracts, and payroll records. Vital records should be identified by business function to help ensure that none are omitted. A brief description of the vital record, the location of originals and backups, and the media type on which the vital record is held must be provided. For each type of vital record, determine any other requirements such as security, environmental requirements, software required to manipulate data, etc. Airport Management should identify and document, by critical business or operations function, vital records required for airport operation under recovery conditions. The following should be part of each record: - Brief description, - Media on which the vital record is held.
2.4.9	Is there a process in place to address and/or satisfy quality control or certification issues associated with the required resources for airport operation?		**Pre-qualify alternate vendors and production sites.** Airport Management should identify where recovery resources may not comply with quality control standards (i.e.: ISO 9000, ISO 17799 or FAA and any other industry standards and regulations) and develop procedures to ensure quality control measures meetairport operational guidelines, and where this can not be accomplished, seek alternate recovery resources.
2.4.10	Where applicable, are multiple sources for airport recovery resources documented and certified?		**Identify alternate suppliers and providers for critical airport services, equipment and supplies.** The airport should develop a robust qualified list of supliers and providers that are capable of offering and supplying what is necessary in the event that the primary supplier is not available. This should include selecting suppliers that use materials or delivery resources from a wholly independent source (i.e. Fuel used for delivery is Electric versus Diesel).
2.4.11	Do the airport's resource requirements at time of disaster serve as the foundation for the extra expense insurance program?		**Review insurance adequacy against output of the Airport Business Impact Analysis.** The airport business impact analysis should be used as the foundation for an estimate of recovery resources (fulfillment). Airport Management should leverage this information in its loss estimates for insurance coverage for extra expense.

3. STRATEGY SELECTION (12 Questions)			
3.1 BUSINESS PROCESS RECOVERY (12 Questions)			
3.1.1	Is a recovery strategy selected for each airport operations process?		Identify and document alternate facilities for the recovery of critical business, operations and systems.
3.1.2	Is the strategy based on a recent (within 12 months) business impact analysis?		Conduct a Business Impact Assessment whenever significant operational changes have occurred, or at least every year.
3.1.3	Have at least two strategies been evaluated for cost and benefit for each airport operational process?		Develop at least one alternate strategy for evaluation. Every airport unit must be prepared to re-organize or relocate critical business functions to an alternate site or alternate airport and to resume operations. Efforts should be focused on selecting an internal, cost-effective recovery solution. In the event external vendor solutions need to be considered, the business unit must prepare and submit a cost-benefit analysis to its business unit management and to senior airport leadership. Alternate site/airport agreements, whether internal or external, must be included in the airport plan document.
3.1.4	Did the selection process include consideration of internal to airport recovery strategies?		Evaluate internal recovery options. Where feasible, an internal solution for recovery should be examined. The ability to leverage existing real estate greatly reduces the cost of recovery in some situations. Airport Management should review their ability to recover internally. It may be possible to distribute the workload of one site across other sites in the event of a disaster. Work with the appropriate airport infrastructure providers to identify if the airport property has any such sites and whether these sites are suitable based on the following considerations: 1. System compatibility (voice, data, access, etc.); Passenger and cargo access; 2. Sufficient capacity to handle the additional processing; Fuel availability; 3. Availability of staff to handle the increased processing load or whether staff can be temporarily transferred to the alternate site; and 4. The ability for critical airport functions to be distributed among multiple sites or whether they must be performed at a single site eg. data transfer ability.
3.1.5	Does the strategy include minimum personnel as has been determined for each phase of recovery?		Verify provision of adequate staffing is documented in the Airport Business Continuity Plan against the resources identified in the Business Impact Analysis. Redundant headcount, the ability to relocate in the time required, and the ability to obtain local resources may inhibit recovery needs. Airport Management should ensure that the strategy chosen could meet the minimum resources required.
3.1.6	Does the strategy include minimum information technology resources as has been determined for each phase of recovery?		Verify provision of adequate IT resources are documented in the Airport Business Continuity Plan against the resources identified in the Business Impact Analysis. Information technology can not always be made available at and alternate site due to timing, expense, and feasibility. Airport Management should ensure that the strategy chosen has the requisite recovery resources.

3.1.7	Does the strategy include minimum facility and space requirements as determined for each phase of recovery?		Verify that the provision of adequate workspace is documented in the Business Continuity Plan vis-a-vis the resources identified in the Business Impact Analysis. The BIA will drive the work space requirements of the organization. Airport Management should ensure that the chosen strategy is provided with the requisite recovery resources.
3.1.8	Does the strategy include minimum specialty equipment as determined for each phase of recovery?		Test the plan for reliance vis-a-vis the provision of specialty equipment. Ensure adequate workarounds are available during lead-time for equipment acquisition. Specialty equipment can not always be made available at an alternate site due to timing, expense, and feasibility. Airport Management should ensure the chosen strategy is provided with the requisite recovery resources.
3.1.9	Did the strategy selection process include issues involving existing suppliers?		Assess supply chain impacts on Airport Operations Continuity requirements. Airport Management should identify where the supply chain could affect the recovery efforts (fuel, freight and passenger access etc...).
3.1.10	Have formal cost estimates been established for recovery strategies selected?		Establish a formal cost estimation process for airport recovery strategies.
3.1.11	Have the costs been categorized by preparation and execution costs (recurring and non-recurring costs)?		Categorize cost options into preparation and execution costs and recurring and non-recurring costs.
3.1.12	Have you taken into account insurance considerations (extra expense insurance)?		Insure coordination with insurance coverage.

4. PLAN DOCUMENTATION (36 Questions)			
4.1 PLAN FORMAT (3 Questions)			
4.1.1	Is the Airport BCP in a logical format that allows all necessary users to access and utilize the plan?		**Develop a logical plan format for the Airport Business Continuity Plan.** Airport management should identify the plan scope and objectives during the plan process initiation phase. The scope of the overall plan should be documented and the individual business/operations process plans should specify the function(s), department(s), unit, business/operations group, and location(s) the airport plan is directed at protecting. Users need to be able to access the parts of the airport plan that are most critical to their individual recovery tasks and priorities.
4.1.2	Is the Airport BCP format consistent with the airport's documentation procedures?		**Document the Airport Business Continuity Plan using acceptable airport enterprise document format standards.** Business/operations continuation plans should be completed utilizing airport management approved and licensed software tools; it is strongly recommended that business/operations units use Airport Enterprise BC planning tools where applicable. In addition, Business Continuation Plans should incorporate the following formatting conventions: - Detailed table of contents - Version Control representing "last update" - Plan version number - Page numbers - Section tabs
4.1.3	Are the definitions and terms utilized in the Airport BCP consistent across all departments, business/operations units, divisions, etc.?		**Develop a glossary of terms and acronyms. Include in all plan documents in consistent format. The nomenclature that is utilized in the plan should be universal across the organization to avoid confusion.**
4.2 PLAN ACCESS (5 Questions)			
4.2.1	Is the most recent copy of the Airport BCP located off-site?		**Maintain copies of the Airport Business Continuity Plan in a remote location.** Airport Management should ensure that a copy of the Airport BCP is stored off-site, and can be accessed for reference purposes. Where feasible, the copy should be stored at a pre-defined alternate recovery site.
4.2.2	Was the off-site storage location for the Airport BCP selected so that it is not exposed by the same perils as the primary site (e.g. flood, earthquake, tornado, etc.)?		**Select an off-site location not subject to the same perils as the primary location.** Airport Management should ensure that a copy of the Airport BCP is stored off-site, and can be accessed for reference purposes. The copy should be stored in a facility that is not exposed to the same risk that the original is exposed to. A complete copy of the plan (hard copy and electronic) should be located off-site (i.e., at home or at a storage facility) to guarantee its availability for use during an emergency.

4.2.3	Is the Airport BCP accessible electronically?		**Implement document control procedures to restrict access to Plan documents to authorized personnel.** Airport Management should consider burning a copy of the plan on a CD or other form of media that can allow for back-up without risk of deletion (CDR: no re-write allowed). A complete copy of the plan (hard copy and electronic) should be located off-site (i.e., at home or at a storage facility) to guarantee its availability for use during an emergency.
4.2.4	Is the Airport BCP accessible by all necessary recovery stakeholders?		**Implement document control procedures to restrict access to Airport Plan documents to authorized personnel.** The BCP contains sensitive organizational information. Airport Management should identify the appropriate stakeholders and control access to the BCP.
4.2.5	Is the appropriate level of information available and accessible to the various recovery stakeholders?		**Implement document control procedures to limit access to Airport Plan documents to authorized personnel.** Airport Management should identify the appropriate stakeholders and control access to the BCP. The information in a business continuity plan is highly sensitive and should only be distributed to those who need to be involved in the recovery. The Airport BCP Coordinator should maintain a list of employees who have copies of the plan and ensure they have a current version.
4.3 PLAN CONTENT (24 Questions)			
4.3.1	Has the airport developed a business continuity plan for its critical business/operations processes?		**Develop a Business Continuity Plan addressing all identified critical business/operations processes.** The BCP should encompass all critical business/operations processes across the airport. The first step in determining what processes are critical is to perform a Business Impact Analysis.
4.3.2	Does the Airport BCP include the BCP Organization & Structure?		**Institute a formal Airport Business Continuity Management Organizational Structure.** A documented command and control structure allows for clear and concise implementation of recovery efforts. At a minimum, the documented command and control structure should include: - The Airport BCP Coordinator - The Airport Crisis Management Team - The Airport Damage Assessment Team - Airport Business Unit Recovery Team Members - The Airport Technology Recovery Team

4.3.3	Does the airport plan include up-to-date contact numbers and addresses for team members and alternates, vendors, suppliers, and emergency support personnel?		**Develop a directory of essential contact information.** Contact numbers (internal call trees, external vendors) are often out of date or maintained by individuals throughout other organizations. This leads to either an incomplete listing, or a lack of a backed up copy of the list. Where feasible, airport management should compile a list of key contact numbers, and store them off-site. Organization charts should include personnel names and titles. As with all documents that are subject to frequent revision, organization charts should note when the document was last updated.
4.3.4	Does the airport plan include alternates for each team position?		**Review staffing requirements and incorporate results in the Airport Business Continuity Plan.** Business/operations units must determine the staffing requirements (primary and alternates) and specific responsibilities and tasks of all teams and team members involved in all phases of recovery from a business or operations disruption.
4.3.5	Does the airport plan include key supplier representatives and contacts and alternate suppliers?		**Include key suppliers in airport plan development.** Business/operations units relying on third party vendors for critical products or services should verify that the vendor has business continuation plans in place that meet the unit's service expectations and requirements. The third party should have a documented and tested plan addressing the recovery and resumption of operations in the event of a business disruption. The plan should be available for review by the business or operations unit, theirs and airport's Internal Audit Groups. These units should be allowed to participate in testing if they so request.
4.3.6	Does the airport have documented team notification procedures?		**Develop and implement a Recovery Team Notification Process.** Disaster declaration, evacuation, damage assessment, emergency response, and off-site storage and retrieval procedures must be documented in the airport plan; all procedures must provide sufficient detail. Business/operations units must identify specific prioritized activities for the recovery of all critical business/operations functions. Communications play a vital role in the recovery effort.
4.3.7	Does the airport have documented vendor notification procedures?		**Develop Vendor Notification procedures.** Airport Management should ensure that there are clear policies and procedures for notifying key supply chain partners key information in crisis situations.
4.3.8	Has the airport documented individual responsibilities and procedures for all time sensitive business processes?		**Document individual responsibilities in the Airport BCP.** In the event primary recovery personnel are not available to carry out recovery efforts, documented policies and procedures ensure that others can do so in their place. Also, documented policies and procedures promote increased awareness within the airport and provide a basis for training.

4.3.9	Is the methodology for Airport BCP Development (i.e., standards, guidelines, policies and procedures,) and the BIA process documented in the plan?		**Define the Business Continuity Planning Methodology within the airport plan documents.** Without governing standards or formal policies and procedures guiding plan development, the airport may be exposed to an increased risk of not having complete plans developed across all its business/operations. Airport Management should consider enhancing its policies and procedures to include these key components: Business Impact Analysis, Plan Development, Documentation, Incident Management, Strategy Selection, Maintenance, Awareness and Training, and Testing.
4.3.10	Is the escalation Sequence properly documented and explained?		**Airport Management should document the process that the airport will utilize to rapidly recognize and escalate incidents affecting the systems and / or the facility.** Ensure that a problem is quickly recognized and managed using a set of procedures to ensure command and control during a disruption to its operation, so that the impact of an incident does not spread to other parts of the airport. It is important to note that not all incidents are considered disasters. Problems that can be detected and repaired within the Recovery Time Objectives (RTO's) established by the business/operations units are not considered disasters. A disaster is *any potential situation that causes a cessation of normal business functions for an unacceptable period of time;* i.e., exceeds the RTO's and requires the implementation of special procedures by the airport Business Recovery Teams.
4.3.11	Are primary and alternate assembly and Airport BCP Emergency Operations Center (EOC) locations identified and documented in the plan?		**Identify and document appropriate locations for assembly of personnel at the time of a disaster, and an Airport BCP Emergency Operations Center (EOC) from which the Airport BCP Emergency Management Team will operate in liason with the Airport Emergency Team and Plan.** All personnel should be aware of the immediate steps to be taken in the event of a disaster. The first task is to ensure that all personnel are accounted for and that everyone is aware of the actions to be taken in initiating the recovery process at a common location. An assembly location should be established where all staff could meet if a disaster occurs. When selecting an assembly location, business units should consider the following: (1) An assembly location should be within walking distance of the original facility but far enough away to ensure employees are not in further danger. It should be large enough to shelter all employees.(2) Permission must be obtained for assembly locations that are not on the airport's leased or owned properties (i.e., a hotel lobby or adjacent third party parking lot).Outdoor assembly locations should always have an alternate location as bad weather can make an outdoor assembly site unusable or unsafe. An assembly location should have access to telephones.

4.3.12	Are all critical processes in the Recovery Time Objectives documented and explained?		**Define and document critical process Recovery Time Objectives measured against consistent criteria.** Based on information provided as part of the BIA (and as a basis for subsequent contingency resource planning requirements), each airport unit must assign a criticality rating. The criticality rating, known as the recovery time objective (RTO, identifies the time frame by which critical business/operations functions must be recovered (e.g., the amount of time a business/operations unit can survive without performing the critical functions). If the recovery time objective is dependent upon the time of the month or year (peak processing period), the interval should be based on the most vulnerable time.
4.3.13	Are manual workarounds documented in the BCP?		**Document existing manual workarounds and alternate processes in the Airport Business Continuity Plan.** Plans must include interim and manual processing strategies where those procedures currently exist or where they may prove useful or necessary to ensure the continuation of a critical business/operations function. Interim processing strategies are temporary solutions a business/operations unit may be able to implement from the time of disruption to the time a critical function is recovered. In some cases, interim business unit procedures may include using a desktop application (e.g., Microsoft Excel®) to input transaction data that can be transferred or uploaded to the original application when that application becomes available. Business/operations units must be creative in developing interim processing solutions for application failures. Plans should document the interim solution, duration, and all required procedures for implementing the solution. *Manual* processing strategies are recovery procedures that do not rely on the computerized application(s) associated with a critical function. Using manual workarounds, critical functions or portions of a critical function can continue to be processed. -Manual procedures should be developed and/or documented in business unit plans.
4.3.14	Did the business/operations process owners document their own manual workarounds/ alternate processes?		**Involve Business/Operations Process Owners in the development of manual workarounds and alternate processes.** Business/operations units, in developing solutions to meet their recovery time objectives, may be able to implement interim and/or manual processing strategies. Those solutions, if available, must be documented in the plan. Interim processing strategies relate to temporary solutions that a unit may be able to implement from the time of disruption to the time that a critical function's applications can be recovered. In some cases, interim business unit procedures may include using a desktop application (e.g., Microsoft Excel®) to input transaction data that can be transferred or uploaded to the original application when that application becomes available. Business/operations units must be creative in developing interim processing solutions for application failures. Plans should document the interim solution, duration, and all required procedures for implementing the solution. Manual processing strategies are recovery procedures that do not rely on the computerized application(s) associated with a critical function. Using manual workarounds, critical functions or portions of a critical function can continue to be processed. Manual procedures should be developed and/or documented in business unit plans.
4.3.15	Is the primary/alternate recovery site documented in the airport BCP?		**Document recovery sites.** Every airport unit must be prepared to relocate critical business functions, where possible, to an alternate site and resume operations. This site should be documented in the plan with appropriate relocation directions.
4.3.16	Are directions to the recovery sites documented in the BCP?		**Develop procedures to access the recovery site, including directions, staffing, and availability.** Every organizational unit must be prepared to relocate critical business functions to an alternate site and resume operations. This site should be documented in the plan with appropriate relocation directions.
4.3.17	Are clear reporting instructions documented in the BCP?		**Develop Command and Control procedures for Incident Management within the Airport Business Continuity Plan.** Airport Management should ensure that the crisis management model represents the response mechanism that will ensure that management is efficient in dealing with disaster incidents through a set of procedures that provides for command and control during a disruption to its operation. The model should allow for rapid recognition of severe problems and an ability to escalate them in a controlled and appropriate manner.
4.3.18	Are data restoration procedures documented in the BCP?		**Document data restoration procedures.** In a disaster, data may be lost because a back-up procedure is not in place or because of systems downtime. Airport Management should ensure that all business/operations units have addressed the question of how they will re-enter transactions/entries/orders into systems that may have been lost or not backed up without adversely affecting the airport operations.
4.3.19	Did the Business Process Owners document their data restoration procedures?		**Require each Airport Business/Operations Process Owner to document necessary data restoration procedures within their process.** Each business/operations process is unique, and therefore to ensure that a data restoration process is complete, it is important that the user community that is responsible for implementing the data restoration process be involved in the creation of the procedures.
4.3.20	Are the testing/exercising objectives/criteria documented within the airport BCP?		**Document plan-testing objectives.** Some objectives could be to: - Determine the readiness of the recovery teams to respond to and recover from a disruption to business, operations and systems at the facility. - Determine whether the required resources for recovery as identified through the business impact analysis recovery are available at recovery locations. - Determine whether the Airport Business Continuity Plan (BCP) has been properly maintained to reflect changes in the business, operations and technology. - Instill a sense of calm and confidence by showing there is a demonstrable state-of-readiness for a potential disruption. - Demonstrate compliance with applicable regulatory requirements.
4.3.21	Is the testing/exercise schedule documented and explained?		**Provide a Test Exercise Schedule.** Business Continuity Plan test frequencies should be derived from the airport's critical business/operations functions' recovery time objectives. Business/operations units must perform a full integrated test (simulated recovery of all critical business/operations functions within a particular unit) every twelve (12) months. It is the business/operations unit's responsibility to schedule with the necessary internal and external service providers and implement testing.

4.3.22	Are pre-test checklists and associated procedures documented in the Airport BCP?		**For advance planning of plan testing, use a Test Preparation Checklist and Worksheet to detail the proper steps to be taken.** Advance preparation for testing is a key component of a successful test program. The worksheet should identify the scope, objectives, assumptions, scenario, test date and test evaluation date.
4.3.23	Are post-test checklists and associated procedures documented in the Airport BCP?		**Develop a Post-Test Evaluation Questionnaire.** Execution and review of test results are the key components of a successful test program. After completion of the tests, all test participants should complete a Post-Test Evaluation Questionnaire.
4.3.24	Are plan maintenance schedules documented in the Airport BCP?		**Provide a Plan Maintenance Schedule.** Plan information that is subject to change must be reviewed and updated semiannually and whenever there is a material change in a business/operations unit's critical functions. The following actions should be performed as part of the updating process: - Update critical functions and associated recovery time objectives where appropriate - Confirm that assembly locations, alternate sites, and emergency operations centers are current and available - Review and update contact lists (employees, vendors, clients, etc.) and emergency phone numbers - Maintain team rosters - Update business/operations unit organization charts - Review vital record and other off-site storage arrangements Review all recovery procedures and update as necessary.
4.4 PLAN REFERENCES & INTEGRATION	**(4 Questions)**		
4.4.1	Are appropriate references to all related plans included in the Airport BCP?		**Provide a concise listing of referenced documents.** BCP plans include evacuation, relocation, manual workarounds, data restoration, IT, etc... Airport Management should ensure that all plan components are included and leveraged for a successful recovery.
4.4.2	Does the Airport BCP properly document and integrate all the airport plans, procedures and related disciplines?		**Integrate individual plans and procedures horizontally across airport operations and vertically across activities.** BCP plans include evacuation, relocation, manual workarounds, data restoration, IT, etc. Airport Management should ensure that all plan components are documented, appropriately referenced and leveraged for a successful recovery.
4.4.3	Is the process for coordinating with outside agencies (e.g., fire department, local government agencies, etc.) documented and explained?		**Conduct coordination planning with outside agencies.** Airport Management should ensure that their plan documents all the potential local agencies, fire, police, and emergency response organizations in the area to ensure that crisis management roles and responsibilities are coordinated in cases of emergency.
4.4.4	Are all necessary third parties (vendors, suppliers, customers, etc.) involved in recovery strategies identified and is appropriate contact information provided?		**Make advance preparations with recovery resource providers and vendors to ensure recovery resource needs can be obtained in an efficient manner.** Where possible, airport management should test the abilities of third parties to provide the services identified in the plan.

5. AWARENESS & TESTING (24 Questions)			
5.1 AWARENESS PROGRAMS (2 Questions)			
5.1.1	Do you have a documented airport BCP awareness and training program?		**Establish an Airport BCP Awareness and Training Program.** Procedures must be established for informing the staff about the BCP and keeping them apprised of changes. Individual responsibilities, plan content and implementation procedures must be fully understood by all.
5.1.2	Do the business/operations unit managers provide employee awareness on their roles in the BCP?		**Improve employee awareness by conducting informative sessions presenting the structure, objectives and importance of the Airport BCP.** Airport employees need to understand their roles as members of the airport BCP community. Procedures must be developed to meet unit BCP training objectives. Business Recovery Teams should be responsible for training staff and promoting and maintaining BCP awareness within their units.
5.2 TEST CRITERIA & OBJECTIVES (11 questions)			
5.2.1	Is there a formal BCP test criteria for all airport departments, business/operations units, divisions, etc.?		**Implement a Plan Test Strategy designed to meet industry standard best practices.** Business continuation plan test exercises must be conducted to demonstrate the ability of the business/operations unit to recover its critical business functions within specified recovery time objectives. All business/operations units must develop a reasonable test strategy and schedule.
5.2.2	Does the test format satisfy aviation industry standard best practices?		**Implement a Plan Test Strategy designed to meet aviation industry standard best practices.** Business/operations units should develop an appropriate test strategy and provide detailed test schedules identifying test levels, test types (for component testing), test objectives, and scheduled test dates. Use an approved planning tool to document these requirements. Three distinct test levels have been identified to help validate a plan's accuracy and effectiveness: the structured walk-through, component testing and integrated simulations (full operations tests). The testing frequency for each test level is determined by the critical function's recovery time objective. Following are short descriptions for each of the three basic test levels: Structured Walk-Through. Also referred to as a "table-top" exercise, the structured walk-through is a paper evaluation of a continuity plan designed to expose errors or omissions without incurring the level of planning and expense associated with a full operations test. The structured walk-through is, in effect, a role-play of a "disaster" scenario. Component Testing. Component tests are actual physical exercises designed to assess the readiness and effectiveness of discrete plan elements and recovery activities. This methodology is effective for identifying and resolving issues that may adversely affect the successful completion of a full operations test. Component tests include: Evacuation tests, an emergency notification test (call tree tests),An application recovery test, a remote or ial-in access test, a critical business/operations function recovery test. Integrated Simulation/Full Operations Test. The full operations test requires extensive planning and preparation and should not be performed until most, if not all, of the plan components have been tested. This exercise provides a business/operations unit with a level of confidence about its ability to recover in an actual event.
5.2.3	Is the scope of the test defined and documented (i.e. what portions of the airport plan will be included in the test) decided in advance of testing?		**Use a Test Preparation Checklist and Worksheet to detail the proper steps to be taken for advance planning of plan testing.** Advance preparation for testing is a key component of a successful test program. The worksheet should identify the scope, objectives, assumptions, scenario, test date and post mortem date.
5.2.4	Are test objectives clearly defined and documented prior to each test?		**Use a Test Preparation Checklist and Worksheet to detail the proper steps to be taken for advance planning of plan testing.** Advance preparation for testing is a key component of a successful test program. The worksheet should identify the scope, objectives, assumptions, scenario, test date and post mortem date.

5.2.5	Are all test assumptions adequately defined and aligned with the test objectives?		**Use a Test Preparation Checklist and Worksheet to detail the proper steps to be taken for advance planning of plan testing.** Advance preparation for testing is a key component of a successful test program. The worksheet should identify the scope, objectives, assumptions, scenario, test date and post mortem date.
5.2.6	Have you tested all airport plan components in the last 12 months?		**Include all plan components in Test Schedule.** Airports that do not test all aspects of their plans have proved to be drastically hampered in their ability to recover from a disaster. Airport Management should ensure that all aspects of their plans are tested regularly.
5.2.7	Are users involved in testing?		**Include end users in plan testing exercises.** Airports that do not involve users in testing have shown that the testing performed is too technically centered, with little benefit to the actual end user. User involvement in the testing process would greatly enhance the effectiveness of testing.
5.2.8	Is there a protocol for establishing test teams and assigning responsibilities?		**Establish a protocol for selecting test teams and assigning responsibilities across the airport operation.**
5.2.9	Have team member alternates received training and/or participated in tests?		**Include team member alternates in training and testing exercises.**
5.2.10	Has your testing included key supply chain vendors?		**Include vendor dependencies in plan testing.** Airports have many supply chain dependencies. Key vendors and service providers may present a single point of failure in your overall operation.
5.2.11	Does an independent observer monitor the tests?		**Designate an observer, independent of the test development process, to observe performance during the test exercise.** An independent observer (not involved in the test preparation) should have the responsibility of monitoring the testing to ensure quality control standards are met, and additionally provide for an objective viewpoint on how to improve testing going forward.
5.3 TEST SCRIPTS (5 Questions)			
5.3.1	Do you utilize test scripts for tests?		**Develop comprehensive test scripts for all testing.** Test scripts provide for an audit-able and repeatable method of testing. Additionally the test script can be used as a method to train employees on the Airport BCP. Test scripts should be used on all tests.
5.3.2	Do the test scripts require proof of test success/failure?		**Require support documentation be retained demonstrating the test performance.** Proof of test success or failure is critical to ensuring that your plan can withstand an audit. Logs, screen prints, output files, etc… can all be use as proof of testing. Airport Management should require that all testing have documented proof of testing and results.
5.3.3	Do the test scripts compare actual to expected results?		**Include a variance analysis in the Test Analysis Report.** Gaps in the recovery plan are best identified through extensive testing. Comparison of actual to expected test results often leads to plan enhancements that provide solutions to meeting recovery needs. Airport Management should ensure that all testing compares actual to expected test results.
5.3.4	Is there a consistent team of internal and third party personnel responsible for developing test scripts?		**Designate a test development team.** A dedicated testing group can provide for a more efficient testing process, and help in the identification of testing interdependencies. An airport testing team should be identified, and their associated roles and responsibilities documented.
5.3.5	Is there a process to facilitate the review all test scripts by a qualified Airport BCP practitioner prior to conducting the test?		**Develop a test script review procedure.** After completion of the tests, all test participants should complete a post test evaluation questionnaire including questions such as: - Was the test objective and scenario clear? - What could have made the test run more smoothly? - Were any procedures/documents missing during the test? (I.e. not stored off-site or not completely documented.) If so, what was missing - Did you notice any single points of failure in the recovery process that were not previously identified? If so, what were they? - Were there any prevention or mitigation measures that would lessen the effort needed to recover? If so, what were they? - Did you make any assumptions that were not clearly made prior to the test? What were they? Did they change the outcome of the test? - Were the appropriate people included in the Recovery Team? If not, who should/should not be part of the Recovery Team? - Did you learn any lessons during this test? What were they?

5.4 TEST EXECUTION & FOLLOW-UP (6 Questions)			
5.4.1	Have plan component tests been conducted for all appropriate business/operations units and/or departments?		**Implement a Component Testing Schedule.** Component Testing is an off-hours exercise to test a particular segment of the recovery plan. It serves to verify the correctness of operating procedures, hardware components and the ability to restore a business unit's critical functions. Examples of this test are a limited systems restoration and a connectivity test at the recovery site. The test may include exercising the effectiveness of the call tree by placing actual phone calls to ensure that awareness exists among recovery teams and that the call trees reflect current staffing and their respective contact information. It may also involve testing evacuation and relocation procedures by having personnel evacuate the a facility and report to the Airport BCP Emergency Operations Center. It is important to note that while personnel might relocate to the a recovery site, this type of testing will not include processing transactions or key activities.
5.4.2	Is there a procedure/tool to log problems/issues during the test?		**Create an observation logging procedure to tracking issues surfaced during testing.** Problems identify weaknesses in plan components. Problem tracking and resolution can lead to altering test objectives going forward and ultimately refining the Airport BCP. A problem tracking process should be established.
5.4.3	Is there a designated team responsible for analyzing and interpreting the test results?		**Designate the person(s) responsible for analyzing test performance.** Test results must be evaluated and documented subsequent to test completion. The business/operations unit should assess the results against predefined internal and airport test objectives and communicate the evaluation to the business/operations unit executives and the Airport BCP Plan Coordinator. Unsuccessful tests must be rescheduled. The internal and Airport Business Continuation Plans must be revised in view of the test results.
5.4.4	Does the follow-up team have a formal process to evaluate the test results?		**Develop a test evaluation process and evaluation metrics.** To determine a test's success, tests results should be compared with predefined test objectives. Failure to meet test objectives will require a rescheduling of the test. Test results that should be measured include elapsed time to perform specific activities, accuracy of documentation for each activity, and amount of work completed. It is worthwhile to distribute evaluation forms to test participants and observers immediately following a test to solicit feedback on their impression of the recovery procedures. Evaluations are also effective for promoting a sense of ownership among those involved.
5.4.5	Is there an evaluation form to facilitate the analysis of the test?		**Develop a standardized test evaluation form.** After completion of the tests, all test participants should complete a post test evaluation questionnaire including questions such as: - Was the test objective and scenario clear? - What could have made the test run more smoothly? - Were any procedures/documents missing during the test? (For example, not stored off-site or not completely documented.)If so, what was missing? - Did you notice any single points of failure in the recovery process that were not previously identified? If so, what were they? - Were there any prevention or mitigation measures that would lessen the effort needed to recover? If so, what were they? - Did you make any assumptions that were not clearly made prior to the test? — What were they? — Did they change the outcome of the test? - Were the appropriate people included in the Recovery Team? — If not, who should/should not be part of the Recovery Team? - Did you learn any lessons during this test? — -What were they?
5.4.6	Is a formal report summarizing the results of the test prepared?		**Provide a Post-Test Analysis report within two weeks of a testing detailing scope of test, participants, problems encountered, lessons learned, and recommendations.** A post mortem session should be conducted after all tests. Involve test participants in a group discussion session to provide feedback on the efficiency of plan procedures. The group discussion and related documentation of test results should occur in a timely manner (i.e., usually within one week following test exercises). The Airport BCP Coordinator, in conjunction with necessary business/operations unit management, will review test results, identify specific action items, assign resolution assignments and related target dates for completion, coordinate appropriate changes to the plan, and reschedule tests, if necessary all BCP test documentation and results should be communicated to business/operations unit management in order to keep all management groups apprised of the their unit's state of preparedness. Copies of test results should be part of the plan document.

6. MAINTENANCE (10 Questions)		
6.1 PLAN MAINTENANCE (7 Questions)		
6.1.1	Are maintenance roles and responsibilities clearly defined and documented?	**Document maintenance roles and responsibilities and include an accountability performance metric.** The Airport Business Continuity Plan (BCP) is designed to be a living document. To ensure it remains current, it must be reviewed periodically and revised to reflect changes within the airport environment. Certain unscheduled business and / or non-business-related events that occur can affect the Airport BCP. For example, system developments, a change in a critical application from one platform to another, new aircraft and technology would require a review of and revision of the recovery and testing strategies, and possibly IT Vendor Contact lists and airline operations and processes. Formally documented maintenance policies and procedures that identify triggers for plan maintenance should be put in place.
6.1.2	Is there a method to ensure all Airport BCP maintenance is approved?	**Implement document all management and change controls to prohibit unauthorized changes to the plan.** Airport Management should ensure that Airport BCP is integrated into the airport's change management process.
6.1.3	Are there automatic triggers to ensure that the core airport plan elements remain current?	Airport **Management should ensure that all trigger events are documented to allow for regular maintenance activities.** A list of event triggers includes but is not limited to: - Regulatory requirements; - New products; - Business acquisitions; - New hardware, platforms, applications, aircraft or other technology change; - Vendor bankruptcy; - Facility move; - Personnel changes or relocations; - Transfer of functions; - Consolidation or outsourcing of work functions; - Change in critical third party vendor/suppliers; - Changes in telecommunications (voice or data); - Structure/equipment; and Results of Airport BCP testing.
6.1.4	Is there a formally documented plan maintenance schedule?	**Implement a documented Plan Maintenance Schedule.** The airport operation continuation plan must be reviewed periodically to ensure all required updates have been performed. Document control procedures should be implemented in order to protect the integrity of the plan. Plan information that is subject to change must be reviewed and updated on a quarterly basis. Whenever there is a material change to a business/operations unit's critical functions; the dynamics of your airport operation must dictate the maintenance.
6.1.5	Is the responsibility for plan maintenance clearly defined at all levels of the airport ?	**Develop and implement Plan maintenance procedures.** In its policies and procedures, the airport management should define the event triggers for maintenance to ensure that all changes affecting the operation of critical business/operations processes are communicated to the appropriate individual(s) responsible for Airport BCP maintenance.

Table 2. *BCAP Questionnaire*

APPENDIX E - Scope of BIAs

To complete the final stage of our research on airport BCP, the ACRP 03-18 research team facilitated a series of interview sessions/discussions on *the effect of the loss, reduced capacity, or impaired effectiveness of key elements of each of the core business functions that support airport operations.*

These elements included:
- key people,
- essential processes,
- physical plant, facilities and assets, or
- technology components.

Researchers met with representatives of similar business areas together so important process and technology interdependencies could be identified. The objective of the sessions was to identify for each airport function its a) "recovery time objectives" (i.e. how long can the airport be without this process, function or activity before its unavailability causes serious impact to airport operation) and its b) "recovery point objectives" (tolerance for losing transactional data when a process is interrupted).

In each group interview, we asked for the attendance of one or two senior representatives who know how the area works and can represent internal dependencies, critical data and files or external (inter-agency/inter-departmental or vendor contract) resources. For large airports, we conducted no more than six sessions of approximately two hours each with the types of functions and *sample departments* listed below, for each of the sessions.

Interviews took take place over the course of two to three days plus a brief one hour review session with airport executive staff representatives. Small airports obviously involved far fewer individuals and were completed in a much shorter time period.

1. **Finance**
   General Accounting
   Payroll
   Accounts Payable
   Accounts Receivable
   Cash Management
   Investments
   Sales
   Insurance and Risk Management

2. **Operations**
   Scheduling
   Inventory Control
   Work Orders
   Quality Assurance, Customer Service

Access Management
Baggage Handling
Passenger Processing
Transportation
Waste Management
Airside support operations
Fuel management and delivery
Noise and wildlife monitoring and control
Regulation and Inspections

3. Human Resources

Personnel
Training
Benefits
Employment
Retirement Services

4. Purchasing & Contracts

Procurement
Legal
Compliance & Privacy
Intellectual Property Protection
Vendor and Business Partner Relations (Tenants, FBOs, Carriers)

5. Physical Plant and Facilities

Security, Police, Public Safety, Emergency Services
Maintenance/Janitorial
Engineering (Buildings, Groundside and Airside Infrastructure)
HVAC and mechanical systems operation
Facility Supplies (Utility paper, cleaning, paint/solvent, safety, weather related)

6. Computers and Technology

Data Center Operations
Application Development
Systems Programming
Help Desk
Telephones
Data Security
Communications

7. Executive Staff – 1 hour only

> Airport Director/CEO/COO/Port Authority Chair
> Exec VP's
> Division GM's
> Strategy and Expansion, Development

Some of these core functions may be the responsibility of departments that are located off-airport, at City Hall, County Office Building, Port Authority Headquarters/Operations Center, or at a contract firm that has been hired to manage them. We requested that airport management assemble the people who could represent these groups in order for these brief sessions to be effective and productive, or that we met with them at their base location.

APPENDIX F - Software Construction and Application Architecture

Tool Components
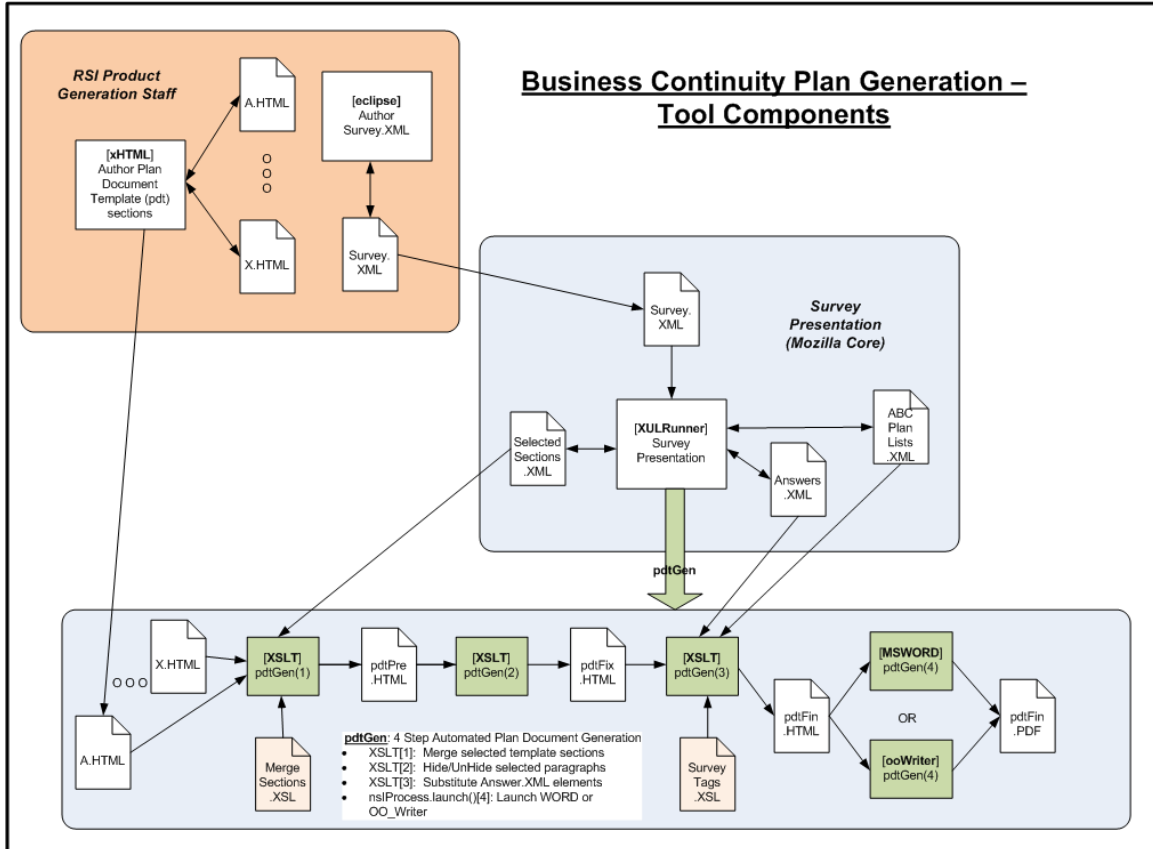
Figure 5.   *Software tool components*

Survey Architecture

svApp Component Diagram
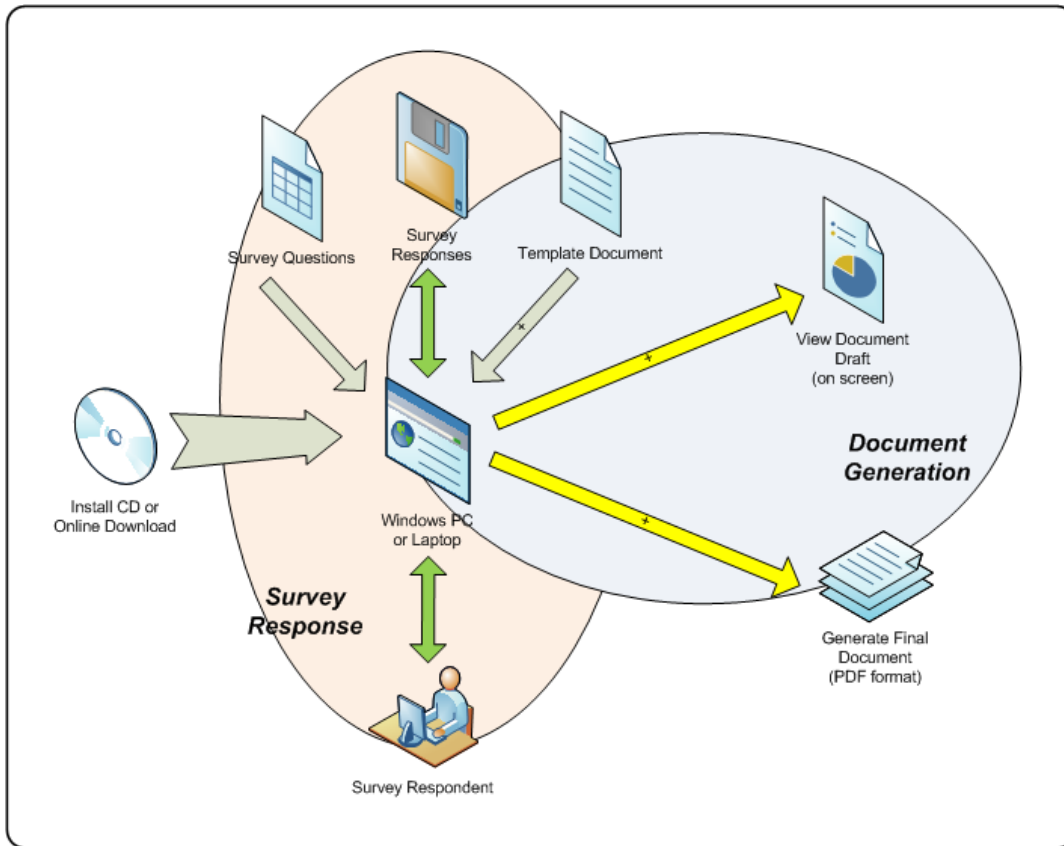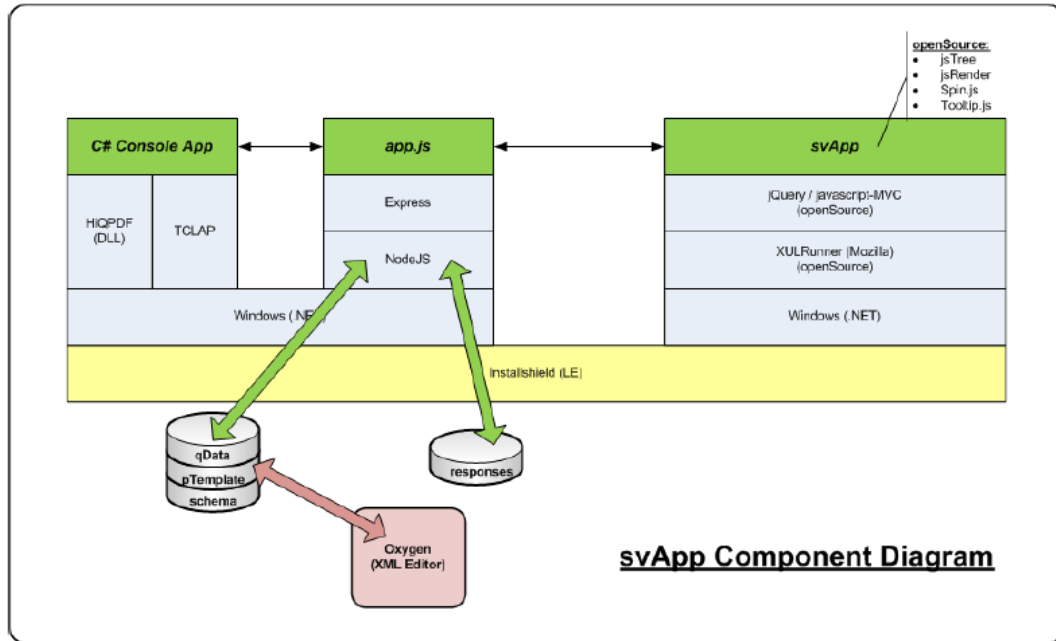
Figure 6. *Survey system architecture*

APPENDIX G - Guidebook Table of Contents

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Figure 7. *Guidebook table of contents*

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APPENDIX H - Software Tool

How the Tool Works

The software tool is an integrated questionnaire that asks airport and FBO respondents to answer a series of questions about how each essential function operates. The questions focus on the four types of resources that each business and operating department require to function at a minimally acceptable level – the unique combination of human resources, technology, plant and equipment, and processes that enable each essential function to do what it is expected to do as part of the airport's or FBO's operating model.

This information derived from the questions is fundamental to developing the airport's business continuity plan:

- It helps determine the relative importance and recovery priority for every function and sub-function in every department.
- It feeds a series of critical resources lists and helps airports define how these resources can be restored or replaced during disruptions.
- It addresses airports' dependency on numerous agencies, contractors, lessees and concessionaires that are contractually or statutorily responsible for the operation of some of the airport's essential functions.

As questions are completed, the software enables respondents to preview the developing business continuity plan in an HTML format on their screens. When all questions have been answered, the tool will create a complete, customized business continuity plan specific to the answers each airport respondent entered into the questionnaire, and will make the plan available for distribution and printing as a PDF document.

Question Types

The survey application includes several distinct types of questions, each that perform a unique function in building the business continuity plan for each airport or FBO.

Radio Buttons

Radio button questions ask a specific declarative question and provide two or more choices to the user, only one of which may be selected. Many of these are "yes/no" questions. They cause the questionnaire to navigate users to additional question based on how they answer. These questions may also trigger the software tool to include relevant content in the business continuity plan.

Figure 8. *Example of radio button questions*

Text Box

Text box questions ask respondents to enter data into one or more boxes – freeform information, addresses, contact information, etc. This information becomes inserted by the software into the business continuity plan, so that it documents specific information about recovering essential functions and resources in every department.

Figure 9. *Example of text box questions*

Check Box

Check box questions present users with the ability to select one or more than one answer from among a list of choices. These questions display many choices and there is no limit to those that can be checked or indicated. They typically generate tables of key data that become part of the business continuity plans.

Figure 10. *Example of compound check box questions*

Drop-Downs

Within check box or text box questions respondents will sometimes see drop-down boxes that present them with a limited set of defined choices from which to choose in answering the question. The resulting choice then populates the related text box, and becomes data that is inserted into tables that will appear in the resulting business continuity plan.
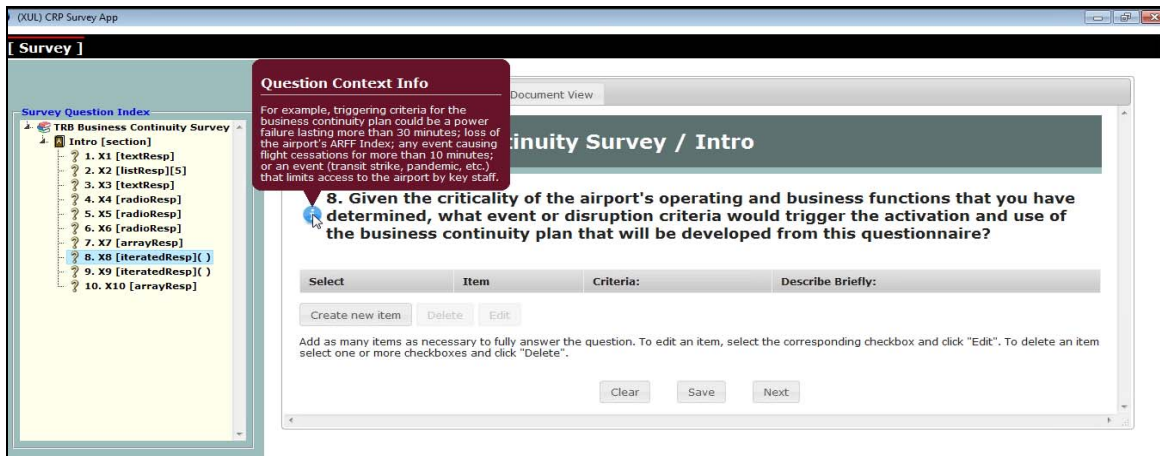
Figure 11. *Example of drop-down questions*

Getting Additional Information

Throughout the questionnaire the 🛈 symbol appears alongside every question for which there is a further or more complete explanation or example that will help respondents answer most accurately. When they "hover" their cursor over these 🛈 symbols a question-specific, or line-specific explanation will appear in a pop-up dialog box.

Figure 12. *Example of additional information pop-up dialog box*

Recovery Priority Scale

The recovery priority scale helps users to define recovery priority across multiple highly differentiated functions, relative to severity of impact on the strategic factors most important to their airport or FBO.

Score	Value	Definition	Factors	Resolution Priority
3	Critical	Loss of these functions causes immediate closure of airport.	FAA certification revocation, loss of core aviation capacity/infrastructure, terminal penalties.	Must resolve immediately.
2	Important	Loss of these functions causes significant negative impact and threatens long term airport viability.	Significant revenue loss, penalties, unsustainably higher cost structure, serious reputation damage, violation of legal covenants and service level agreements.	Must resolve within one week.
1	Convenient	Loss of these functions causes modest or tolerable level of negative impact.	Moderate but recoverable negative impact.	Should resolve when feasible.
0	Non-Existent or Non-Essential	These functions are not present at airport, or not at all essential.	N/A	N/A

Table 3. *The recovery priority scale*

How The Recovery Priority Scale Defines the Survey

The mandatory survey question shown on the following page uses the recovery priority scale to ask respondents to rank the importance and recovery of every business and operating function or groups of like functions. Assigning a "0" defines the functional area as not important (and thus low on the recovery triage list) or non-existent at the airport, eliminating the entire section from the questionnaire, so those assignments should be carefully considered. Not only will those questions not be presented in the survey, they will be excluded from the business continuity plan when it is completed.

All operating and business sections that receive a "3", "2", or "1" rating in this question remain in the respondent's survey and will be included in their business continuity plan.

6.* Using the following scale (3 = absolutely critical, 2 = important, 1 = convenient, and 0 = not present at your airport or not necessary at all), indicate how essential is each of these functions or groups of business and operational activities to the satisfactory operation of the airport. "Critical" functions are those whose loss causes immediate/imminent airport closure; the loss of the functions must be resolved immediately (those prompting FAA revocation of operating certificate or causing loss of core aviation capacity and infrastructure.) "Important" functions are those whose loss causes significant negative impact and threatens the long term viability of the airport; the loss of the functions must be resolved within one week (those that imply significant revenue loss, penalties, unsustainable costs, or material violations of legal covenants or service level agreements.) "Convenient" functions are those whose loss causes a modest or tolerable negative impact; the loss of the functions will be resolved when feasible. If a function is not present at the airport or non-essential, a "0" mark will eliminate it from your survey.

	Absolutely Critical 3	Important 2	Convenient 1	Non-essential/ Non-existent 0
Co-Located Military ⓘ	○	○	○	◉
Aircraft Rescue and Firefighting ⓘ	○	○	○	◉
Back-Up Power Sources ⓘ	○	○	○	◉
Commercial and Aviation Lessees ⓘ	○	○	○	◉
Environmental Operations ⓘ	○	○	○	◉
Finance and Accounting ⓘ	○	○	○	◉
General Aviation ⓘ	○	○	○	◉
Government Security and Controls ⓘ	○	○	○	◉
Government Relations ⓘ	○	○	○	◉
Grants and Projects ⓘ	○	○	○	◉
Human Resources ⓘ	○	○	○	◉
Infrastructure and Utilities ⓘ	○	○	○	◉
Legal and Contracts ⓘ	○	○	○	◉
Other Property Management ⓘ	○	○	○	◉
Passenger Management ⓘ	○	○	○	◉
Payroll and Benefits ⓘ	○	○	○	◉
Public Parking Operations ⓘ	○	○	○	◉
PR and Marketing Communications ⓘ	○	○	○	◉
Public Safety ⓘ	○	○	○	◉
Retail Concessions ⓘ	○	○	○	◉
Winter Operations ⓘ	○	○	○	◉
On-Site Fuel Supply ⓘ	○	○	○	◉
Aeronautical Operations Support ⓘ	○	○	○	◉
Ramp and Hangar Operations ⓘ	○	○	○	◉
Airport Maintenance and Repair ⓘ	○	○	○	◉
Purchasing, Receiving and Supplies ⓘ	○	○	○	◉
Groundside Transportation ⓘ	○	○	○	◉
Air Traffic Control Operations ⓘ	○	○	○	◉
Shared Infrastructure ⓘ	○	○	○	◉
Cargo Operations ⓘ	○	○	○	◉
Terminal Buildings ⓘ	○	○	○	◉
Information Technology ⓘ	○	○	○	◉
Financial Reporting ⓘ	○	○	○	◉

Figure 13. *Question that ranks recovery priorities for every airport function*

Common Questions in the Survey Application

Eliminating Sections and Questions

Respondents will answer a set of approximately 50-75 substantive questions in each of the 34 business and operating sections that they rank *(in the Question shown on the previous page)* as "critical", "important" or "convenient" in recovery priority to the airport. Those sections that receive a "Not Essential" or "Not Present" ranking will be eliminated from the respondent's questionnaire completely by the software tool. Based on the specific operational circumstances at the airport or FBO, therefore, respondents will be presented with all or some subset of these 34 question sections.

Similarly, the answers provided to some questions will effectively nullify certain follow-on questions, leaving some airports or FBOs with fewer relevant questions in each section. For example, if a question asks if an essential function is provided by a contractor, an affirmative answer will launch several questions about the identity of the contractor(s), while a negative answer will skip those follow-on questions entirely.

Explanation of Each Type of Question

Each section of survey questions asks the same kinds of questions of each function or department. Those core question types are described and illustrated in full in the guidebook. These descriptions provide a more detailed explanation and richer context for users than the software tool can provide in the information drop-down dialog boxes.

Many survey sections include several function-specific questions in addition to these base questions. *These function-specific questions are identified and described in the section of the guidebook titled "Questionnaire Sections in Detail".*

Using the Resulting Business Continuity Plan

The Plan is Complete – Now What?

The business continuity plan that will be generated by the software tool will be formatted "on the fly" by the tool and converted from native HTML into a PDF file document for printing and electronic distribution. Because every airport and FBO that completes the survey operates with a unique business model based on their location, environment, ownership, strategy and culture, every plan generated by this tool will be site-specific, based on how each question has been answered.

Each plan will consist of the first three sections shown in the sample below. Recovery plans for each function that is present the airport – and that has been completed in the questionnaire - will be documented in Section 4 of the resulting plan.

Figure 14.   *Sample BCP table of contents*

Every airport's business continuity plan generated by the software tool will also include Sections 5 and 6, shown below, as well as several appendices that address other important elements of business continuity, such as plan testing, review and maintenance.

Figure 15.   *Sample of Plan Testing, Review, and Maintenance Section*

APPENDIX I - Why BCP is Important at Airports

Critical National Infrastructure

The airport industry is a key part of the critical national infrastructure in the US Airports efficiently move people and cargo, support commercial activity and economic development, and enable us to respond to emergencies and crises in a timely way and protect the country. They provide the vital commercial and general aviation backbone that connects communities and people across the nation's span of urban, rural and remote localities.

It is in the national interest that this critical transportation sector develops a sustainable internal capacity for operational resiliency. Assuring the continuity of airport operations is important – not just at large and medium hubs and cargo airports, but also at non-hub, reliever, commercial service and general aviation airports, and for the companies that are fixed base operators (FBOs) and specialized aviation services operators (SASOs) at these airports.

Because each of the thousands of these public and private aviation entities serves as a vital element in the lives and livelihoods of Americans everywhere, the extended or prolonged loss or disruption of function and capacity at any of their facilities poses a significant community, regional or national threat. The US economy and way of life depends on a vital and uninterrupted aviation sector.

Findings from Airport BCP Research

The research that preceded the development of this business continuity guidebook and software tool amplified the original premise behind ACRP 03-18 that American airports of all sizes need a better understanding of business continuity planning and a basic roadmap to implementing it. The research confirmed that some airports have some level of BCP established, but that a majority of them have not made BCP a critical priority. It concluded that airports need a process and supporting information that will enable them to address business continuity with the same rigor and expertise that they do emergency management.

The key findings of the research are summarized on the following pages:

Awareness of Business Continuity is Minimal and Operational Understanding is Inconsistent

The US airport industry is largely unaware of business continuity planning and the discipline is widely misunderstood. There is an absence of reliable sources of information in the industry about BCP, and no dedicated provider of training or best practices on the topic. The top aviation schools do not address BCP in their textbooks, curricula or classrooms, so young airport executives arrive at their first jobs with no grounding in the process. Until ACRP 03-18, BCP has not been a topic, track or item presented from the podium at industry conferences or workshops, and it is rarely addressed in their publications or resource lists.

BCP is not widely practiced at airports, so airport employees do not get exposure to the topic on the job. And there is virtually nothing in the available press or online that addresses business continuity in an airport context. Because the airport is a neophyte industry with regard to implementing BCP, even a small step forward will represent significant progress.

Airports Excel at Emergency Management, but Not at Business Continuity Planning

One core reason for this lack of understanding is airports' confusion between emergency management and business continuity. Airports are very good at emergency management, because they are "genetically" focused on emergencies, accidents and safety and are extremely resourceful and competent at preventing, preparing for, mitigating and recovering from emergencies. Airports are also good at emergency response because they have sufficient management, staffing, training, funding, regulatory impetus, emergency supplies and equipment, federal assistance, and memoranda of understanding (MOUs) for regional collaboration through local emergency services and disaster operating groups (DOGs).

Until ACRP 03-18, airports have benefitted from no such regulatory basis, funding, and support for business continuity activities. It is therefore the intent of this guidebook and accompanying software tool to help airport management better understand and initiate them into the mindset and process of business continuity planning.

The Uniquely Complex Operating Environment at Airports Makes Business Continuity Both More Important and More Challenging

Airports are unique mix of critical and supporting roles and responsibilities that are spread across multiple entities at fixed locations. Key functions are managed by airport staff, commercial contractors, retail concessionaires, FBOs and SASOs, or municipal, county or port authority personnel. Creating a business continuity plan that takes into account that broad mix of independent or quasi-independent public, private or

government entities makes the BCP process more challenging, than if all airport functions were controlled centrally.

As operating-centric entities with staffing and resource constraints, institutional knowledge at many airports often remains in the hands (and heads) of a single manager, small group of executives, or highly specialized personnel. Because this knowledge may be undocumented, when there is a "succession situation" - such as dismissal, relocation, death, retirement, or sickness - single points of failure may exist at many airports, increasing risk of failure during prolonged disruptions. While essential functions at some airports may be supported by recovery strategies that are well understood, documented and exercised by their staffs, many airports have no written or rehearsed plan. Responsibility for business continuity management, like other airport functions, also may reside with the municipality, county or port authority – adding complexity to the challenge.

Business Partners Have Vested Interest in Airport Business Continuity Plans

Airports are co-dependent with a number of stakeholders with which they maintain symbiotic relationships. Airlines, as the single most important operating tenants at airports, maintain corporate business continuity plans. They need to understand what they can expect from the host airport when it activates its recovery plan, so they can align their expectations and actions as carriers that depend on efficient airport recovery.

Similarly, all other commercial lessees, FBOs and retail concessionaires need to both develop and maintain their own business continuity plans and align them with the airport's recovery plan. The general aviation community is enthusiastic about airports having a commitment to operational recovery because private and business aviators fundamentally depend on continuity of available services, assets, and facilities.

Airport BCP activity ideally should involve these partners appropriately in planning and exercises. Some of these dependent interests have choice and mobility and can relocate their activities to alternative airports that do have plans for operational resiliency.

No Specific Government Entity Mandates Airport Business Continuity

Business continuity planning should be a core strength at airports of all categories and sizes because they are one of the most important components of our national critical infrastructure. Notwithstanding the standards and federal guidance around BCP summarized in an appendix to this guidebook, one of the reasons that BCP is not a core strength is that no federal mandate specifically requires airports to develop a business continuity plan. No grant specifically funds airport BCP. Having a business continuity plan is neither an official obligation in consideration of grant assurances, nor funded by any aviation program at the federal level. The absence of a mandate should be no reason

for any airport to delay the adoption of a business continuity process and to develop a plan.

Few Airports have Made BCP a Strategic Priority or Assigned Formal Responsibility

A minority of airports have included comprehensive business continuity planning in their strategic plan, or support business continuity planning from the top by establishing a steering committee to oversee it. Few have formally named someone who is qualified to lead a business continuity effort. Those that have made some progress in business continuity planning may have located the process far down in their organizations at a non-strategic level. For some, responsibility for BCP may reside in city hall, the county office building or the airport authority. Until someone of rank and authority openly makes business continuity a priority, it is unlikely to become one, or to compete effectively for scarce airport resources.

Airports are Unique

While the unique operating environment at airports – and the broad mix of airport types, sizes and missions – makes the business continuity process somewhat more challenging, it also makes the results more beneficial. This is because airport operations are a complex interplay of aeronautical, non-aeronautical commercial and support activities that are the responsibility of numerous independent entities.

Those functions that are essential are often not performed by airport employees, but by contractors, commercial tenants, federal agencies, FBOs and SASOs. As a result authority and control is dissipated, and divided among a sometimes large number of contractually connected organizations. This multi-organizational structure makes business continuity planning at airports more complex because the "chain of command" is indirect, and plans must heavily rely on the operational continuity planning of each distinct entity.

Airports' reliance on departments and agencies of local government, commercial partners, FBOs and SASOs and federal agencies for so many of their essential functions creates an intricately interdependent "micro supply chain." This requires that their business continuity plans include careful and detailed collaboration and integration among a potentially large number of distinct and independent stakeholders. The "lines of demarcation" that distinguish operational responsibility among these various entities can become blurred, varying greatly from airport to airport.

This level of complexity makes the BCP process at airports challenging, because so many core functions are out of airports' control and the tools available to them may be limited to contractual provisions with commercial partners, memoranda of understanding

(MOUs) with governmental entities or simply strong administrative coordination. It requires special attention to be paid to how this disparate mix of interdependent stakeholders can optimally coordinate business and operational recovery in some predictable way.

Ownership

The ownership dynamics of US airports contributes to the business continuity challenge because – for publicly owned airports - responsibility for numerous business functions may lie with departments at city hall, the county office building, a port authority or even the state. In these cases some airport business departments may actually be an extension of the larger city or county departments – in areas like finance and accounting (F&A), human resources (HR), or payroll. If airport employees are formally considered employees of the municipality, for example, then the airport's payroll, labor relations or HR function may be actually housed and performed at city hall, not at the airport. Likewise grants, funding, government relations, bond issues and many other essential airport activities may be coordinated jurisdictionally, with the airport as the beneficiary, but with operations centrally coordinated or controlled.

The implications for BCP include extending the management commitment process, assessment, planning process, and training and exercises beyond the boundaries of the airport to each of those core functions that are managed by a governmental department or agency – wherever it may be physically located. This adds a level of complexity and demands inclusion, coordination and integration for two reasons. First, the city's or county's continuity of operations plan (COOP) needs to be considered, during the airport's business continuity planning process, to understand the extent to which it defines and documents what the airport can expect for departmental recovery priorities and resources for those externally-managed and located functions.

Second, the airport plan must take into account those externalities to which its recovery planning is exposed because many city or county (i.e. non-airport related) disruptions can partially or fully bring operations in these off-site business departments to a halt. These non-airport disruptions can still impact airport operational continuity because of its dependency on those department functions that are essentially "outsourced" to the local government.

Commercial Tenants

Just as some essential airport *business* functions may rest with local government, the same is true for many airport *operating* functions that are controlled under contract, commercial or land lease by tenants, concessionaires and lessees. Commercial flight operations are the responsibility of airlines; general aviation operations are run by the FBO; fueling services may be provided by the fueling contractor or FBO; parking may be the responsibility of a parking contractor; rental car service is the province of the national

car rental companies; and public safety may be outsourced to a private security contractor.

While airports likely maintain strong and cooperative relationships with these private operational contractors, tenants and commercial lessees, their influence on the business continuity planning practices of these companies may practically be limited to contractual leasehold provisions that require the adoption and maintenance of an internal business continuity plan.

Large, well funded national companies like commercial airlines, car rental companies, hotels and others can be expected to practice business continuity planning at the corporate level. The question for the airport is whether those plans have recovery systems and processes in place for airport-specific operations – i.e. "what is Acme Parking's plan for operational recovery at *my* airport?" Airports' essential operating functions that are contractually controlled through commercial relationships present the challenge in how to ensure an orderly recovery of functions that the airport itself does not directly control.

Those contractors that may not have any plan for recovering their operations at the airport present the airport with an even more serious problem - its business continuity plan may not be able to address critical functions that must be recovered in order for the larger airport to function smoothly.

Consequently, the airport BCP process needs to make inquiries about the local recovery capacity and plans of its essential commercial lessees and contractors, and the airport BCP team should be in close contact with its counterparts at each of those entities. Ideally, the airport's plan can be integrated with the business continuity plans of these companies so recovery goals and expectations are as cohesive as possible.

If the airport decides to add a business continuity planning provision or requirement to its commercial leases and agreements, it should apply such a contractual requirement fairly and equally across all similar types of agreements and leases in order to maintain compliance with FAA requirements.

Government Agencies Operating at Airports

Several mission critical airport functions are the responsibility of independent federal agencies that are not part of the airport organizational or management structure. The Federal Aviation Administration (FAA) is responsible for aeronautical operations, air traffic control (ATC) activities, and related inspections and certifications in areas like aircraft rescue and firefighting (ARFF) operations. The Transportation Safety Administration (TSA) screens all passengers, baggage and cargo to minimize flight safety risk and coordinates enforcement activities with the airport's public safety department. The Customs and Border Protection Agency (CBP) and the Immigration and Customs Enforcement Agency (ICE) clear inbound passengers from international flights, inspect their declarations for prohibited materials and enforce immigration laws. In some

airports the US Department of Agriculture operates to screen and isolate potentially harmful organic and agricultural substances so the US food chain and public health are protected.

The functions provided by these agencies are not controlled by the airport. Without the recovery of these operations after disruptions, however, aviation operations are impossible, departing passengers cannot board, arriving international passengers cannot legally enter the US, and harmful substances and dangerous people may not be detected and their entry interdicted. Downtime or partial or complete loss of any of these essential airport functions can massively impact the airport and its other tenants and concessionaires. The result could be a cascading crisis – thousands of stranded passengers who require food, restroom facilities, access to medical facilities, sleeping quarters, and transportation; massive flight delays and cancellations having far reaching impact on airlines' flight networks; or flight and passenger diversions to alternative international arrival airports.

While airports have no direct responsibility for the operational processes of the key federal agencies operating there, each of these agencies rely on airport-provided space, infrastructure, utilities, and access in order to accomplish their roles there. So the airport's business continuity plan must provide for the recovery of supporting services and infrastructure for these agencies, and take into consideration their airport-specific operational contingency plans.

Fixed Base Operators (FBOs) and Specialized Aviation Services Operators (SASOs)

At most airports FBOs (and sometimes SASOs) manage entire complex operations like the general aviation operations, aircraft maintenance or the fueling function. The entirety of operations and management of some smaller airports may be the handled by an FBO, managed under contract with the owning municipality or county. This places an extraordinary responsibility for key essential airport functions in the hands of private or publicly held companies.

Not only should FBOs and SASOs maintain a corporate business continuity plan for the entire scope of their company operations, they should also have and exercise a site-specific and scope-specific recovery planning process for each fixed base operation they provide to airports. Functional business and operational recovery after disruptions may "look different" at each unique airport where they operate, with widely varying priorities and considerations based on each airport's mission, strategy, resources and recovery capacity.

APPENDIX J - Abbreviations and Acronyms

AAAE	American Association of Airport Executives
AAR	After Action Report
ACI-NA	Airports Council International – North America
ACRP	Airport Cooperative Research Program
AOA	Aviation Operations Area
ARFF	Aircraft Rescue and Firefighting
ASIS	American Society for Industrial Security
ATC	Air Traffic Control
ATCT	Air Traffic Control Tower
BCI	Business Continuity Institute
BCP	Business Continuity Planning
BIA	Business Impact Analysis (or Assessment)
BSI	British Standards Institute
CAD	Computer Aided Design
CBCI	Certified – Business Continuity Institute
CBCP	Certified Business Continuity Professional
CBP	US Customs and Border Protection
CCTV	Closed Circuit Television
CD	Compact Disk
CMT	Crisis Management Team
COOP	Continuity of Operations Plan
CPA	Certified Public Accountant
DHS	US Department of Homeland Security
DOG	Disaster Operating Group
DR	Disaster Recovery
DRII	Disaster Recovery Institute International
EEOC	Equal Employment Opportunity Commission
EMT	Emergency Medical Technician
EOC	Emergency Operations Center
ERM	Enterprise Risk Management
F&A	Finance and Administration
FAA	Federal Aviation Administration
FBO	Fixed Base Operator
FBCI	Fellow – Business Continuity Institute
FEMA	Federal Emergency Management Agency
FOD	Foreign Objects and Debris
FTE	Full Time Equivalent
GA	General Aviation
GIF	Graphic Interchange Format
HAZMAT	Hazardous Materials
HR	Human Resources

HSPD	Homeland Security Presidential Directive
HTML	Hypertext Mark-up Language
HVAC	Heating, Ventilation and Air Conditioning
IBEW	International Brotherhood of Electrical Workers
ICE	US Immigration and Customs Enforcement
IROPS	Irregular Operations
ISP	Internet Service Provider
IT	Information Technology (Department)
JPEG	Joint Photographic Experts Group
LEO	Law Enforcement Officer
MAC	Macintosh (Series of Personal Computers form Apple)
MBCI	Member – Business Continuity Institute
MBCP	Master Business Continuity Professional
MOU	Memorandum of Understanding
NAVAIDS	Navigation Aids
NFPA	National Fire Protection Association
NOTAM	Notice to Airmen
NTSB	National Transportation Safety Board
P&L	Profit and Loss (Statement)
PC	Personal Computer
PDF	Portable Document Format
PR	Public Relations
PS-PREP	Private Sector Preparedness
RFP	Request for Proposals
RFID	Radio Frequency Identification
RPO	Recovery Point Objective
RTO	Recovery Time Objective
SASO	Specialized Aviation Service Operator
SBCI	Specialist – Business Continuity Institute
SCADA	Supervisory Control and Data Acquisition (Systems)
SIDA	Secure Identification Display Area
SLA	Service Level Agreement
SPS	Standby Power Supply
TRB	Transportation Research Board
TSA	Transportation Security Administration
UPS	Uninterruptable Power Supply
UV	Ultra-violet
VIP	Very Important Persons

Table 4. *Abbreviations and acronyms*