



Analysis and Recommendations for Developing Integrated Airport Information Systems

DETAILS

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AUTHORS

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AUTHOR ACKNOWLEDGMENTS

Aero Tech Consulting, Inc., (ATCI) performed the research reported herein under ACRP 01-03. ATCI is the contractor for this study. Christine Stocking is the Principal Investigator, Steve Loper of Amadeus Consulting Inc., is the Co-Principal Investigator for Integration, and James DeLong is the Co-Investigator for Airports. Thomas Healy serves as the Administrator. Vicki Braunagel is the Investigator on Airport Financial and Business issues.

ABSTRACT

This summary report documents the efforts of the Aero Tech Consulting, Inc. (ATCI) team in response to a Request for Proposal (RFP) issued by the Airport Cooperative Research Program (ACRP). This RFP detailed the challenges facing airport managers when attempting to integrate many disparate systems, software applications, financial and operational activities at airports today. The ATCI team sought to illustrate the “big picture” through extensive research, interviews with airline executives and Information Technology professionals, and analysis of several aviation systems. The team has developed a list of best practices and validated all of its findings through a systematic series of phased interviews. When necessary, the team has leveraged its own understanding of the industry, developed over many decades of experience as airline, airport and Information Technology executives. This study resulted in the description of a typical airport organization, the completion of a comprehensive handbook for the integration of existing systems, as well as several recommendations for an approach to the future.

EXECUTIVE SUMMARY

The aviation industry is complicated with many factors that need to be considered. Airport managers at every level are tasked with organizing information, making pivotal decisions, increasing efficiency, and coordinating operational and financial activities. Airport managers rely on various systems, some of which are decades old, and there is little communication between these systems. Making sense of these disparate systems and volumes of information is a key challenge facing the aviation industry today. The Aero Tech Consulting Inc., (ATCI) team (the team) was contracted to develop a Handbook that builds the foundation for airports to meet these challenges.

Developing this understanding requires a disciplined approach to research, analysis, communication, collaboration, and problem-solving. For more than a year, the team has collaborated with the ACRP panel, facilitating key meetings, and proactively seeking review for certain portions of the research. The team has developed several pivotal metrics, identified the business-critical information, and the associated key data elements. In order to fully understand the big picture, and validate all of its findings, the team has conducted dozens of interviews with airport managers, IT professionals, and software providers. Combined with the wealth of experience of the team members themselves, the collaborative interviews generate a comprehensive knowledge base of the various elements involved. Furthermore, the team has reviewed hundreds of existing systems, software applications and technical papers, looking for business critical information and the techniques and tools used to integrate this information. More than 200 studies have been analyzed and 70 software solutions reviewed.

Throughout the research effort, the team has defined and refined a list of best practices for the efficient operation and integration of existing airport systems. The team also describes a “manager’s dashboard” that is designed to organize and optimize disparate systems on an airport manager’s desktop, giving them immediate access to the information they need. There are also many elements of infrastructure that should be considered

including a central web site, several software packages, and additional practices designed to improve efficiency in operation. This summary report details the team's collaborative approach to the research.

SECTION 1

BACKGROUND

The Industry Need

Most airport information technology (IT) systems are nearly 20 years old and, in many cases, are not adequate to handle the complexities of current transactions. The lack of integration between systems requires staff to enter data multiple times, consuming staff time and compromising accuracy. Some of these older systems are extremely limited and inflexible and rely heavily on manual processing. Moreover, these systems often may not quickly and accurately provide the right information to management.

Many airport systems operate independently, which limits their value. Information needed in one airport functional area often exists in another but, if the systems are independent and do not share information, it may not be readily available or may have to be entered manually.

Today's aviation industry is faced with fast changing requirements and regulations, increasing passenger volumes, and unstable financial conditions. In this environment, airport management needs to have real-time information to identify and solve problems quickly. Information technology can improve a manager's ability to take these actions but the systems need to be orchestrated so they can work together.

The Airport Cooperative Research Program (ACRP) addressed this industry need in the Request for Proposal (RFP) for Project No. 01-03 (the project) titled "ANALYSIS AND RECOMMENDATIONS FOR DEVELOPING INTEGRATED AIRPORT INFORMATION SYSTEMS". The project panel (the panel) defined this need as follows:

"Accurate, properly formatted and timely reporting of airport activity and financial data is critical to effectively managing today's airports. These data and the resultant business-critical information are necessary (and often legally required) to effectively meet operational needs, make informed business decisions, and forecast operational and financial trends. Integrating these data within existing and future electronic systems is also necessary to improve accuracy and productivity.

"Currently, industry practices for identifying, gathering, processing data, and reporting this business-critical information vary significantly across airport categories or even among airports within the same category. A lack of consistent, accurate, and timely information results from a lack of applied technology and overall standardized industry practices to define and gather information. Fully integrating these data into other systems can result in increased productivity. In addition, although large, complex airports have a need for more sophisticated data, airports of all sizes have a demonstrated need for certain minimum data to manage their facilities effectively. Issues related to identifying, gathering, processing, and reporting data keep airports from achieving the full benefit of completely integrated information."

The Project Objectives

In line with these needs, the panel described the objectives of the project in the RFP as follows:

"The four objectives of this research are to (1) assess the current state of the industry related to managing appropriate data from business-related financial and operational activity, (2) develop guidelines and current best practices to fully integrate these data and the business-critical information that they indicate, (3) develop functional specifications for procuring open-architecture systems for integrating these data, and (4) describe a vision of an airport with fully integrated business, operational,

and financial information systems.

“These objectives shall be incorporated into a handbook that provides useful information and resources for airports as they implement systems necessary to effectively meet operational needs, make informed business decisions, and forecast operational and financial trends.”

The Target Audience

As the project progressed, the primary target audience for the Handbook was defined as second, third and fourth level airport management. The Executive Summary of the Handbook is designed to quickly inform and capture the attention of top level airport management.

The ATCI Team

The Aero Tech Consulting, Inc. (ATCI) team (the team) was formed to address this specific industry need. Several team members have experienced the need for sound, timely management information as they faced major decisions during airport management careers. This motivated team members to build a resource that would help the industry. The team members are:

Christine Stocking. Principal Investigator

James DeLong. Co-Principal Investigator Airports

Steve Loper of Amadeus Consulting, Inc. Co-Principal Investigator Integration

Vicki Braunagel. Airport Financial and Business

Tom Healy. Administrator

SECTION 2

RESEARCH APPROACH

Working with the ACRP Staff and the Panel

The panel and the ACRP Senior Program Officer, Mike Salamone, offered the team valuable experience and an objective sounding board for this project. Plans and work product were shared with the panel several times throughout the project and the resulting feedback and direction were invaluable.

The panel offered a rich blend of airport operation and Information Technology experience. The panel members were:

Scott Brockman. Panel Chair, AAE, CFO, Memphis Selby.

Bradford S. Bowman. President, Bowman Group.

Phillip D. Brodt. VP, GCR Associates.

John K. Duval. AAE, Safety and Security Coordinator, Beverly Municipal Airport

Anita Eldridge. Finance and HR, Sarasota Manatee Airport

Kimberly Jones. Finance and Administration, Dane County Regional Airport

Don Snider. IT/IS Manager, Wichita Airport Authority

The team began by addressing the feedback that was received as a part of the Proposal Review Summary from the panel. This feedback addressed the initial Work Plan that was submitted as a part of the response to the RFP. An Amplified Work Plan that provided details for Phase 1 (Tasks 1 through 3) was built and submitted on August 15th, 2007. Time requirements, a detailed budget for Tasks 1, 2 and 3 and a project schedule were included. The budget and project schedule called for a meeting with the panel early in the project.

A face-to-face “kick-off” meeting was held with the ACRP Senior Program Officer to review process and procedures. The panel participated in part of this meeting via a conference call. This personal visit by the Senior Program Officer was helpful in building a working relationship. Monthly and quarterly reports were submitted throughout the project to keep the Senior Program Officer informed of progress and any concerns that arose.

Two team members met with the panel and the Senior Program Officer in Washington DC in September, 2007 to review the Amplified Work Plan. In order to maintain funds for other tasks in the project, the other members of the team participated via conference call. Approval to complete Tasks 1 and 2 was then received.

Once the research involved in Tasks 1 and 2 was completed, a Detailed Plan was completed to address the processes needed to complete Tasks 3 and 4.

A Detailed Plan summarizing the results of Tasks 1 and 2 was submitted to the panel and the Senior Program Officer in November, 2007. It included:

- A summary of the methods, information processes and systems for each of the six functional areas identified in the project;
- Generic descriptions of the systems used in each functional area;
- A recap of aviation data sources;
- The strategy for validation of the initial analysis, relying on the experience of the members and their many contacts throughout the industry;

- A list of interview candidates and the questions the team proposed to ask each candidate in order to validate the team’s research findings, which would eventually shape the Handbook;
- A summary of the research conducted thus far;
- Detailed spreadsheets of business-critical information and key data elements by functional area; and
- Citations for some of the research material collected.

In December 2007, the team discussed the systems aspect of the research with the Panel on a conference call. Since the project’s objectives centered on Integration and since the Handbook could not include anything that might be considered proprietary, an endorsement or lack of an endorsement, it was agreed that the Handbook would not include lists of the hundreds of IT systems that are available to airports.

The validation steps in Tasks 3 and 4 were completed by interviewing aviation organization executives, managers at airports of various sizes and IT company leaders. An Interim Report was prepared and submitted to the panel. This Report included a sample of an airport “manager’s dashboard” and an annotated outline for the Handbook including a draft of some Handbook content. The panel provided helpful guidance concerning the Handbook draft’s style, format and language and a revised draft based on this feedback was submitted.

Four team members attended a two-day meeting with seven panel members and the Senior Program Officer in California in mid-May, 2008. Over the course of two days, the panel provided feedback and guidance on significant issues such as the vision underlying the project, the audience for the handbook, an approach for the executive summary, use of a case study to provide context, and the desire for several additional “dashboards”.

Building the Foundation of the Handbook

The project began with the building of a comprehensive list of the business-critical information that team members relied on most heavily during their many years of experience running major airports. Since this data was valuable to the experienced members of the team, it was expected that it would be the information that other airport senior managers would find most useful. The team’s systems research identified data elements that the systems deliver and these elements were matched with the team’s in-house list.

Next, key data elements that comprise this business-critical information were listed. Published lists of business-critical information or key data elements were not found during extensive research of industry papers, studies and presentations. Since these types of reference materials were not available, the team members’ knowledge and experience was relied upon to create these foundational lists. The lists were validated as a part of in-depth interviews with respected industry executives.

There had been an expectation that the project would compile different lists of key data elements and business-critical information based on airport size. However, the research determined that, while airport operators often had similar needs for “core” sets of information, the size of the airport did not play a major role in establishing information needs. Rather, information needs were driven by the airport’s business issues and priorities.

The final list includes 102 items of business-critical information and 376 key data elements that comprise the business-critical information. Then the following details were added for each of the items of business-critical information that were listed: functional area, division, metrics, data source, capture method, notification threshold, capture frequency, data uses, and regulatory requirements.

Airport Functional Areas

The business-critical information and key data elements were categorized by functional areas of an airport. It was recognized early in the project that judgments must be made about how airports are organized. Airports are organized to meet business needs and, since those needs differ from airport to airport, each airport organization is different. The subject of the “right way” to organize an airport is always sensitive so choosing

one organization was somewhat risky. However, the team believed that the development of the Handbook would be best served by setting one organization that would be used consistently throughout the Handbook

After some discussion, an organization was defined that consisted of six functional areas with sixteen divisions. This organization encompasses all the responsibilities at an airport of any size. Team members' broad and deep knowledge of airport operations was critical to defining this organization.

The functional areas and divisions that are used throughout the Handbook are as follows:

Finance/Administration. Finance, Human Resources, Information Technology and Telecommunications, Properties.

Operations. Airfield Operations, Ground Transportation, Parking, Terminal Landside.

Maintenance. Facility Maintenance, Fleet Maintenance, Maintenance Control, Materials Management.

Engineering. Design and Construction, Environmental, Planning.

Security.

Public Relations.

Assessing the Current State of the Industry

Two major research tasks began early in the project and proceeded in parallel to gather the information needed to assess the current state of the industry:

- Software systems that address an airport manager's information needs were researched through a wide variety of sources.
- Technical papers, studies and presentations that were in any way relevant to data integration in aviation and other industries were examined. Tentative conclusions were reached that would be relevant to airport operations and finance.

The process for and the results of each of these research tasks are detailed below.

Data Integration Documents

The team worked on this phase of the project in a highly collaborative manner. This phase began with team discussions about the master plan for the research and individual research assignments were made. Initial results were discussed and categorized. The team conducted additional searches, revised the method of organizing the results, copied and stored some information on the ATCI network and added hyperlinks to the tables so that the information could be easily accessed.

Software Systems

The current state was established by identifying the systems that are available and commonly used at airports through research into software systems, web sites, technical papers, studies, reports, seminars, and other literature. These items were researched and organized by their main functions and key data elements.

Other Literature

Early in the research, a search was made to find documents that address system integration at airports. More than 200 documents on aviation information were found, read and organized.

In spite of this exhaustive search, there was limited success in identifying documents that would help the project in any of the following three key areas:

- Best practice studies on airport IT systems integration

- Vital metrics
- Key data elements that in turn comprise business-critical information

While benchmarking and best practices studies were secured in other areas of airport performance, it became apparent that airport information processes have not been extensively studied or presented.

Descriptions of business models were found during this research. However, they were limited to one or two areas of an airport and focused around particular software that the airport was implementing.

These studies helped the team understand the progress that some airports have made and were discussed in interviews with airport executives. Some of these studies were validated during several in-depth interviews with respected industry executives.

Interview Strategy

Throughout the research effort, interviews were conducted with experts in various fields. The interviews had two purposes:

- To validate the findings and tentative conclusions reached during the project.
- To learn about other developments in IT from the working knowledge of respected industry executives.

The interviews were focused on three groups of industry experts. The individuals were chosen based on industry reputation, personal relationships and information discovered during the research. The groups interviewed and the general objectives for the interviews were as follows:

- **National Aviation Organization Executives** - This was a “big picture” overview to ensure that research results and the subsequent Handbook would be relevant to the industry.
- **Airport Executives** – These interviews provided a managerial overview from executives at airports of different sizes and were particularly helpful to the project. These senior managers had stories of their successes and failures and their most important lessons in the field of systems integration.
- **Information Technology Industry Executives** – Software vendor interviews were intended to obtain specifications on collecting data elements used to create business-critical information and to confirm the lists of business-critical information, key data elements and best practices.

While not everyone returned calls when contacted, 90 percent agreed to be interviewed. The external validation interviews were concentrated on the what, the how and the why of IT integration, specifically:

- Information flows through current systems within airports of various sizes;
- Integration methods, processes, and potential pitfalls;
- Assessing the current state of the industry’s integration efforts; and
- The best practices used to integrate these types of disparate systems and data.

Most of the interviews were conducted via conference calls. However, face-to-face meetings were held with the IT manager and division chiefs at one airport and with the Airport Director at another airport.

The interviews began with a list of basic questions. The responses often opened doors to other subjects and prompted other questions. This flexibility enabled the interviewer to gather information that addressed basic concerns but also resulted in information that was unexpected and led to several important conclusions.

Early in the interview process, the interviews sought different perspectives and understandings of why and how airport integration projects were undertaken. This was achieved by selecting individuals whose responsibilities ranged from the CEO level to IT Manager level. The visions, perceptions and lessons learned varied considerably depending on the individual’s duties and this added a rich mixture of insight for the Handbook.

The interviews were conducted in stages so that the results could be collated, processed and analyzed at each stage. Executives with general duties within the aviation industry were interviewed first, followed by

individuals with more specific experience. Generally, this meant that industry organization executives were interviewed first followed by airport operators and IT company executives.

Whenever possible, interviews with airport operators were conducted with individuals that have led or served on airport industry organizations. It was expected that these individuals would provide an overall view of the industry and also identify experts at other airports that should be interviewed. This approach worked well.

To encourage participation, individuals were asked to participate in the interviews with letters from the National Academies. The letters were individualized and included the subjects that would be discussed in the interviews. In addition, calls to former associates were made on several occasions. Graphics and text that had been developed were sent in advance to show lists of business-critical information, key data, data sets and information processes. If appropriate to the interviewee, information on software was included.

The airport executive interviews confirmed initial understandings of the current state of the industry. The key data, business-critical information and best practices lists were refined and expanded. Software solutions were identified and prioritized. This functional information resulted in several detailed questions and insights for software company interviews.

The interviews with software companies were designed to validate architecture, compile lessons learned, and refine understandings of legacy systems and the methods of extracting information out of proprietary and legacy software. The interviewees' experience in implementing airport system projects provided a view from the "outside" that was extremely beneficial.

Appointments were made to conduct the interviews in all cases. The interviews often began with an eight slide PowerPoint presentation that introduced the project and its objectives, explained the purpose of the interviews, assured the interviewees of confidentiality and outlined how their comments would be used. GoToMeeting was used for conference call services.

Basic confidentiality was promised to the interviewees, who were assured that names would be published to thank the participants but information given or quotes made would not be attributed to individuals. Thus, the Handbook takes the form of "one major airport IT director said x, y, and z" or "a major hub airport reported a, b, and c." Being "off the record" allowed the interviewees to be candid and forthcoming about lessons learned, difficulties seen, and mistakes made. Further, this approach resulted in a higher level of synthesis for the research findings, combining insights from various interviewees much more smoothly.

Reality Checks

The interviews tended to include a high level of detail, which required stepping back from those details to maintain a larger perspective. To do this, responses were analyzed and the validation strategy or individual questions or both were sometimes revised. All results were sorted and reviewed to determine what was useful.

The team's Principal Investigator reviewed the results from interviews with aviation industry and airport executives in order to refine the software company questions and interview strategy.

Software companies were interviewed in much the same manner as airport executives and the Principal Investigator reviewed these responses from an integration perspective. This accomplished a reality check on the technical side to determine whether the interviews captured the right information and whether the project's larger objectives were still in focus.

The Handbook is intended to be readable and user-friendly. It underwent several editing iterations so that it would be presented in a usable format and become an asset for airport operators.

This phase of the effort is where much of the collaboration took place. Once studies had been collected and reviewed, interviews had been conducted, and information had been analyzed, the goal was to achieve a high-level view of the issues.

Best Practice Steps

A list of best practices was started early in the project and was continually revised and expanded throughout the research and interview stages. Team member collaboration was at a premium while building this list. The experience and knowledge of the team members was used throughout these stages and successful

methods and practices were solicited from many of the industry executives that were interviewed. The best practices list comprises a large portion of the Handbook and is a testament to collaboration and interviewing skills.

SECTION 3

CONCLUSIONS AND RECOMMENDATIONS

How Conclusions Were Reached

The following conclusions are based on two primary sources - hundreds of hours of research and interviews, and the ATCI team members' combined 140 years of aviation and Information Technology experience. Some of the conclusions were reached quickly while others required hours of discussion and collaboration.

Conclusions

The Conclusions from the project include the following:

- Integration is primarily about information with technology being secondary.
- Data can come from many sources, and it is critical to identify the rules of that data to determine what data should be used and when, where, and how.
- Integration efforts should also evaluate information processes and identify systems that can share data freely.
- Managers need self-configurable dashboards, as they require a wide variety of information. One size will not fit all.
- Airports could realize substantial cost savings and operational efficiency by integrating financial management systems with operations.
- The aviation industry is beginning to work on some integration standards and should continue this effort.

The Findings and Applications of the Research are found in the associated Handbook.

The Manager's Dashboard

Although every airport manager needs the same "core" key data, their priorities are different, which drives different information needs. Managers need the flexibility to choose the right information and have it readily available. This need for flexibility created a vision of a fully integrated airport that would become the manager's dashboard.

It is important to understand what the manager's dashboard is and is not. The manager's dashboard is a vision; the capability for a manager to quickly and easily access the information that is regularly used from the desktop computer. The display of this information would be configured to the manager's needs, showing the data that reflects individual priorities. To bring the information to the display, automated processes would gather the data needed from many different airport systems and then calculate or develop the metrics which that manager has identified and display them in the desired format on the manager's computer. Coupled with that display will be an ability to "drill down" to the levels of detail required for analysis.

However, a manager's dashboard that displays all the needed information from a fully integrated airport does not exist. At the time the research was conducted in early 2008, no airport had a working manager's dashboard integrating all the business-critical information from an airport's many different systems and displaying it in a self-configurable format on the manager's desktop computer. However, the technology needed to create an airport manager's dashboard already exists and some airports have successfully completed the

systems integration. Many lessons were learned from these successes.

Recommendations

The following recommendations have industry-wide implications and are made to the leaders of industry policy-setting organizations, airport executives, the ACRP, and IT companies:

- Promote research into Capital Budget Information and Decision Procedures – Research and interviews revealed an industry-wide need for a system to aid airport operators in managing the Capital Improvement Program (CIP). Currently there are no standards, thresholds, procedures or best practices to make effective, timely and informed capital improvement decisions about changes at an airport. Airport Operators need management information systems to allocate financial resources, approve or deny changes and generally keep capital projects on track and on budget. This system would require the integration of many airport systems that currently operate independently. The results of this research could be developed into a volume that would supplement this Handbook.
- Support the development of industry-wide integration standards.
- Encourage the FAA to allow tail numbers to be included in the data feeds to an airport. This would save millions of dollars in unnecessary software purchases and allow airports to collect data real time rather than waiting 90 days after the flight, which is the current practice.
- Foster research in the financial arena to develop algorithms and detailed procedures for back office integration.
- Suggest research to delineate the integration differences between common-use airports and non-common use airports. This research should evaluate methods that common-use airports use to successfully integrate their systems and evaluate these methods to apply that knowledge to airports that are not common-use.
- Consider use of a website devoted to airport systems integration. This site would continually update information in a central location and increase interaction among IT professionals.

Appendix A

AVIATION DATA SOURCES

Federal Aviation Administration (FAA)

The FAA website is one of the most comprehensive data sources for an airport. This section highlights what is offered on the FAA website.

Legal and Regulatory

Data sources include applicable Federal Aviation Regulations, advisory circulars, technical bulletins, and guidance applicable to airports. URLs include:

Title 14 CFR Part 139 Airport Certification. Includes certification standards, rules and guidelines and regional guidelines. <http://www.faa.gov/airports_airtraffic/airports/airport_safety/part139_cert>. Last accessed November 1, 2007.

Airport Advisory Circulars. Current FAA Advisory Circulars required for use in Airport Improvement Program (AIP) funded and Passenger Facility Charge (PFC) approved projects. http://www.faa.gov/airports_airtraffic/airports/resources/advisory_circulars/ >. Last accessed November 1, 2007.

Title 14 CFR Part 50 Airport Noise Compatibility Planning.
<http://www.risingup.com/fars/info/150-index.shtml>

Airport Grant Assurances. http://www.faa.gov/airports_airtraffic/airports/aip/grant_assurances/

Passenger Facility Charge Record of Decisions. http://www.faa.gov/airports_airtraffic/airports/pfc/

Airman's Information Manual. <http://www.rockwellcollinsclubs.com/aardvark/Documents/AIM.pdf>

Title 40 CFR Part 260. U.S. Environmental Protection Agency (EPA). Hazardous Remediation Waste Requirements. <http://www.epa.gov/EPA-WASTE/1998/November/Day-30/f30269.htm>.

U.S. Army Corps of Engineers Remedial Investigation/Feasibility Study (RI/FS). Chap 3. EM 1110-1-4014. <http://www.usace.army.mil/publications/eng-manuals/em1110-1-4014/c-3.pdf>.

Department of Homeland Security Regulations and Directives. <http://www.cbpunion.org/DHS.aspx>

Transportation Security Administration Regulations and Directives.
http://www.tsa.gov/join/benefits/editorial_1429.shtm

Institute of Electrical and Electronic Engineers Inc. <http://www.ieee.org/portal/site>

U.S. Department of Transportation Competition Plan. (Required for large airports)
http://www.faa.gov/airports_airtraffic/airports/aip/guidance_letters/media/pgl_04_08a_competition_plans_06_07.pdf

49 CFR Part 1542 Airport Security.
http://www.tsa.gov/research/laws/regs/editorial_multi_image_with_table_0203.shtm

Appendix A

Occupational Safety and Health Administration. www.osha.gov

Title 49 CFR Part 23. Participation by Disadvantaged Business Enterprises (DBE) in Airport Concessions Federal Aviation Administration – Airport Obstructions Standards Committee (AOSC) Decision Document04http://www.faa.gov/about/office_org/headquarters_offices/arc/programs/aosc/media/AOSC_DecisionDocument_04_Signed.pdf

Funding and Development

Airports Financial Assistance. < http://www.faa.gov/about/office_org/headquarters_offices/arp/offices/app/app500/> Last accessed November 1, 2007.

Airport & Airway Trust Fund. Provides funding for the “federal commitment to the nation’s aviation system” through aviation-related excise taxes (e.g., passenger tickets, passenger flight segments, international arrivals/departures, cargo waybills, aviation fuels, and frequent flyer mile awards from non-airline sources like credit cards). <http://www.faa.gov/airports_airtraffic/trust_fund/> Last accessed November 1, 2007.

Airport Improvement Program. Provides grants for planning and developing public-use airports. Data includes funding; data, tools, and resources (such as <http://asrs.arc.nasa.gov/search/database.html> grant apportionment data); publications and forms, and guidance. <http://www.faa.gov/airports_airtraffic/airports/aip/> Last accessed November 1, 2007.

Engineering/Construction. Provides guidance for design, engineering, and construction projects including data for airport diagrams, airport surveying, and operations and performance data. <http://www.faa.gov/airports_airtraffic/airports/construction/>. Last accessed November 1, 2007.

National Plan of Integrated Airport Systems. Identifies more than 3,300 airports eligible to receive Federal grants under the AIP. Data includes estimates of the amount of AIP money needed to fund infrastructure development projects to bring these airports up to current design standards and add capacity to congested airports. <http://www.faa.gov/airports_airtraffic/airports/planning_capacity/npias/>. Last accessed November 1, 2007.

Passenger Facility Charge. Includes monthly reports and data charts, historical data, and regional guidance. <http://www.faa.gov/airports_airtraffic/airports/pfc/>. Last accessed November 1, 2007.

FAA Flight Data Feeds

National Flight Data Center Documentation. Use a special log in to get current flight information through FAA <<http://nfdc.faa.gov/index.jsp>>. Last accessed November 1, 2007.

Flight Delay Information - Air Traffic Control System Command Center. Map showing general delays at major airports. <<http://www.fly.faa.gov/flyfaa/usmap.jsp>>. Last accessed November 1, 2007.

Forms

FAA Forms. Available at <http://www.faa.gov/airports_airtraffic/airports/resources/forms/>. Last accessed November 1, 2007. Forms on the website include:

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Airport Master Record (FAA/DOT) -5010 Forms. All airports are required to submit this form to FAA. The form provides detail to the FAA which includes counts of based aircraft and (for non-towered airports) annual aircraft operations to help forecast airport use for planning. <<http://forms.faa.gov/forms/faa5010-5.pdf>>. Last accessed November 6, 2007. These data are available at <http://www.faa.gov/airports_airtraffic/airports/airport_safety/airportdata_5010/>. Last accessed November 6, 2007.

Airport Financial Reports. 5100-126 Forms- Financial Government Payment Report Forms 5100-127 Operating and Financial Summary, etc.

Airport Improvement Program. Form SF 424 – Application for Federal Assistance, Forms 5100-100 Application for Development Projects, etc.

Other FAA

Future Airport Capacity Task. An Analysis of Airports and Metropolitan Area Demand and Operational Capacity in the Future. <http://www.faa.gov/airports_airtraffic/airports/resources/publications/reports/media/fact_2.pdf> Last accessed November 6, 2007.

Aeronautical Information Manual Official Guide to Basic Flight Information and Air Traffic Control (ATC) Procedures. <http://www.faa.gov/airports_airtraffic/air_traffic/publications/atpubs/aim/>. Last accessed November 1, 2007.

United States Government Accountability Office

Federal User Fees. Airports use some of these fees to fund FAA-approved projects. The purpose is to enhance safety, security, or capacity; reduce noise, or increase air carrier competition. GAO-07-113. <<http://www.gao.gov/new.items/d071131.pdf>>. Last accessed November 6, 2007.

Airport Finance. Information on changes to the Airport Improvement Plan (AIP) (Observations on Planned Airport Development Costs and Funding Levels and the Administration's Proposed Changes in the Airport Improvement Program GAO-07-885 June 29, 2007) <<http://www.gao.gov/new.items/d071131.pdf>>. Last accessed November 6, 2007.

Department of Homeland Security

Data sources include all DHS regulations and supporting documents. <<http://www.dhs.gov/xinfo/share/laws/>>. Last accessed November 6, 2007. Other information includes:

Constellation/Automated Critical Asset Management System (C/ACAMS). Lets state and local government users collect and use asset data and protection information to develop incident response and recovery plans to protect infrastructure assets. C/ACAMS helps law enforcement, public safety and emergency response personnel develop and implement critical infrastructure/key resource (CI/KR) protection programs. C/ACAMS also helps users identify and assess critical infrastructure, develop incident response and recovery protection plans and build public/private partnerships. <<http://www.dhs.gov/xinfo/share/>>

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programs/gc_1190729724456.shtm>. Last accessed November 6, 2007.

The Homeland Security Information Network is a computer-based counterterrorism communications system that allows all states and major urban areas to collect and disseminate information between federal, state, and local agencies involved in combating terrorism. <http://www.dhs.gov/xinfo/share/programs/gc_1156888108137.shtm>. Last accessed November 6, 2007.

National Infrastructure Protection Plan (NIPP) and supporting Sector-Specific Plans (SSPs) sets national priorities, goals, and requirements for effective distribution of funding and resources which will help ensure that our government, economy, and public services continue in the event of a terrorist attack or other disaster.<http://www.dhs.gov/xprevprot/programs/editorial_0827.shtm>. Last accessed November 6, 2007.

Transportation Security Administration

Historical check point wait times. <<http://waittime.tsa.dhs.gov/index.html>>. Last accessed November 6, 2007.

Transportation Security Laws. <http://www.tsa.gov/research/laws/law_regulation_rule_0010.shtm>. Last accessed November 6, 2007.

Transportation Security Regulations. <http://www.tsa.gov/research/laws/regs/editorial_multi_image_with_table_0205.shtm>. Last accessed November 6, 2007.

Security fees. <<http://www.tsa.gov/research/fees/index.shtm>>. Last accessed November 6, 2007.

Department of Transportation

The Bureau of Transportation Statistics' (BTS) Air Traffic Statistics and Airline Financial Statistics include domestic airline indicators for both traffic and finance: <<http://ntl.bts.gov/faq/financstats.html>>. Last accessed November 6, 2007.

The Office of Aviation Analysis provides financial reports on airlines. <http://ostpxweb.dot.gov/aviation/X50%20Role_files/airlinefinancialreview.htm>. Last accessed November 6, 2007.

Economic and Population Data

Local Chamber of Commerce and Local Economic Development Council provide projections for company growth, employment, trends in growth of different industry sectors.

Bureau of Statistics Census Data provide demographic information, population, median income.

Banks provide economic forecasts.

Universities provide demographic information, population, median income.

Appendix A

Safety Data

Aviation Safety Reporting System (ASRS) captures confidential reports, analyzes the resulting aviation safety data, and disseminates vital information to the aviation community. <<http://asrs.arc.nasa.gov/>> Last accessed November 6, 2007.

National Transportation Safety Board (NTSB) Accident and Incident Database <<http://www.nts.gov/nts/query.asp>>. Last accessed November 6, 2007. The NASDAC review of NTSB weather-related accidents studied this database to find relationships between the type of weather involved and the various factors such as operating rules of Federal Aviation Regulations (FAR), type of operation, light condition, and phase of flight <http://www.asias.faa.gov/aviation_studies/weather_study/studyindex.html>. Last accessed November 6, 2007.

U.S. Department of Labor Occupational Safety & Health Administration (OSHA) <<http://www.osha.gov/>> provides regulations and standards for employees. They also provide training modules, for example a baggage handling module <<http://www.osha.gov/SLTC/etools/baggagehandling/index.html>>

Others

American Association of Airport Executives <<http://www.aaae.org/>> Last accessed November 6, 2007.

American Council of Engineering Companies <<http://www.acec.org/>> Last accessed November 6, 2007.

American Society of Civil Engineers (Transportation & Development Institute) <<http://content.tanddi.org/>>. Last accessed November 6, 2007.

DOD Policy Board on Federal Aviation. Established by DoD Directive 5030.19, "DoD Responsibilities on Federal Aviation and National Airspace System Matters", June 15, 1997 <<http://www.dtic.mil/whs/directives/corres/html/503019.htm>>. Last accessed November 6, 2007.

National Association of State Aviation Officials. <<http://www.nasao.org/>>. Last accessed November 6, 2007.

National Business Aviation Association. <<http://www.nbaa.org/>>. Last accessed November 6, 2007

The Official Airline Guide. <<http://www.oag.com/oag/website/com/en/Home/>>. Last accessed November 6, 2007

Standard Schedules Information Manual. <<http://www.iata.org/ps/publications/SSIM.htm>>

Common-Use Passenger Processing Systems.

- International Air Transport Association Recommended Practice 1797
- Air Transport Association Recommended Practice 30.201
- Airports Council International Recommended Practice 500A07

Appendix A

Standard Developing Organizations

The **IEEE** name was originally an acronym for the Institute of Electrical and Electronics Engineers, Inc. <http://www.ieee.org/portal/site>.

UN/CEFACT (United Nations Center for Trade Facilitation and Electronic Business). A United Nations Center whose mission it is to provide an open, XML-based infrastructure that enables the global use of electronic business information in an interoperable, secure and consistent matter by trading all partners. < <http://unece.org/cefact/>>

OASIS (Organization for the Advancement of Structured Information Standards). A not-for-profit consortium that drives the development, convergence and adoption of open standards for the global information society. The consortium produces web services standards and standards for security, e-business and standardization efforts in the public sector and for application-specific markets. Oasis has over 5,000 participants representing over 600 organizations and individual members in 100 countries. Members set the OASIS technical Agenda. Completed work is ratified by open ballot. The consortium hosts two of the most widely respected information portals of XML and Web service standards, Cover Pages and XML.Org. OASIS member sections include Computer Graphics Metafile (CGM) Open IDtrust, Legal XML and Open CSA. <http://www.oasis-open.org/home/index.php>.

OTA (The Open Travel Alliance). A not-for-profit trade association founded in 1999 by travel companies to create electronic message structures to facilitate communication between the disparate systems in the global travel industries. OTA is comprised of companies representing airlines, car rental firms, hotels, cruise lines, railways, leisure suppliers, service providers, tour operators, travel agencies, solution providers, technology companies and distributors. OTA's mission is to engineer specifications that make data transmission flow smoothly throughout travel, tourism and hospitality industries. OTA creates, expands and drives adoption of open universal data specifications, including but not limited to the use of XML, for the electronic exchange of business information of all sectors of the travel industry. <http://www.opentravel.org/>.

IATA (International Air Transport Association). The global trade organization of air transport. For over 60 years IATA has developed the commercial standards that built a global industry. Its members comprise of over 240 airlines, the world leading passenger cargo among them—representing 94% of the world's scheduled international air traffic. <http://www.iata.org/index.htm>.

ISO (International Organization for Standards). Is a network of the national standards institute of 157 countries that coordinate the system. Each country has one member with a Central Secretariat in Geneva, Switzerland. ISO is a non-governmental organization: Its members are not as is the case in the United Nations system, delegations of national governments. Nevertheless, ISO occupies a special position between the public and private sectors. This is because, on one hand, many of its member institutes are part of the governmental structure of their countries, or are mandated by their government. On the other hand, other members have their roots uniquely in the private sector, having been set up by the national partnership of industry associations. Therefore, ISO is able to act as a bridging organization in which a consensus can be reached on solutions that

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meet both requirements of business and the broader needs of society, such as the needs of stakeholder groups like consumers and users. While ISO defines its self as a non-governmental organization (NGOs). Its practice ISO acts as a consortium with strong links to governments. Standards set by ISO include Technical Reports, Technical Specifications, ISO/ International Electro Technical Commission (IEC) Joint Technical Committee. <http://www.iso.org/error/sitedown.html>.

ANSI (American National Standards Institute). Empowers its members and constituents to strengthen the U.S. marketplace position in the global economy while helping to assure the safety and health of consumers and the protection of the environment. The Institute oversees the creation, promulgation and use of thousands of norms and guidelines that directly impact businesses in nearly every sector: from acoustical devices to construction equipment, from dairy and livestock production to energy distribution, and many more. ANSI is also actively engaged in accrediting programs that assess conformance to standards – including globally-recognized cross-sector programs such as the ISO 9000 (quality) and ISO 14000 (environmental) management systems.

NISS (National Institute of Statistical Sciences). Was established in 1991 by the national statistics societies and the Research Triangle universities and organizations, with the mission to identify, catalyze and foster high-impact, cross-disciplinary research involving the statistical sciences. Our strategic vision, adopted in 2004, calls for a NISS that is a truly national institute, serving the statistical sciences community by:

Performing and stimulating high-impact research at critical interfaces between statistics and disciplinary science, as well as between industry/government and academia.

Supporting career development at all levels, with special emphasis on postdoctorals.

Engaging the national community in a variety of activities, especially but not exclusively by means of the affiliates programs and SAMSI.

FUNCTIONAL AREA FINANCE AND ADMINISTRATION

DIVISION IT/TELECOM

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Analysis and Recommendations for Developing Integrated Airport Information Systems

Business-critical information	Key data elements	Metrics	Data source	Capture method	Notification threshold	Capture frequency	Data uses	Regulatory and reporting requirements
Systems reliability information and security statistics	(1) Reliability statistics: IT equipment downtime hours by system; help desk calls per system (2) Security information: number of unauthorized attempts to access IT systems (successful and unsuccessful)	Return on investment of various systems; systems security trends; systems reliability trends	IT records	Systems tracking and reporting functions	As requested by management	Regularly as needed	Monitor necessary IT systems for usage, outages, customer service issues, security risks; develop information security plan and integrate with physical security functions (best practice)	
IT performance and maintenance	(1) IT maintenance: number of information system ports maintained; number of FIDS screens, jetways, visual paging displays, baggage carousels, and flight departure displays maintained; personal computers maintained per staff; network servers maintained per staff (2) IT performance: percentage of time network is available; number of personal computer problems resolved	Efficiency metrics, such as percentage of systems downtime; cost and time for system recovery in event of disaster	IT records	IT staff; systems tracking and reporting functions	As requested by management	Regularly as needed	Monitor use of resources and efficiency; disaster recovery planning	
Amount of unauthorized or personal use of computers	Number of instances of inappropriate email content or internet use; percentage of network capacity devoted to personal use	Percentage of systems capacity available at peak periods; percentage of employees engaged in inappropriate internet use	IT records	IT systems or network usage monitoring and tracking software	As requested by management	Regularly as needed	Ensure appropriate use of equipment and systems and availability of network capacity when required	

FUNCTIONAL AREA FINANCE AND ADMINISTRATION

DIVISION PROPERTIES

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Business-critical information	Key data elements	Metrics	Data source	Capture method	Notification threshold	Capture frequency	Data uses	Regulatory and reporting requirements
Tenant lease data	<p>(1) Leased space: amount and location of square footage of space leased by tenant by type (exclusive, non-exclusive, common use, etc.)</p> <p>(2) Lease rentals: annual space rentals by tenant; other annual lease payment obligations by tenant</p> <p>(3) Lease terms: term (length) of lease by tenant; usage requirements</p>	Public space square footage per PAX; return on investment calculations; vacant-to-total space ratio; airline revenue as a percentage of total revenue	Lease summaries with contract terms from Properties division, CAD	Manually, CAD and property management software systems	Upon contract execution, when trigger events are upcoming (e.g., end of or options to extend term)	Once upon contract execution, updated as needed for changes	Provides information as needed for negotiations, disputes, and facilities planning	
Concessions data	<p>(1) Leased space: leased square footage by concession type (food and beverage, news and gift, duty free, advertising, hotels, services, etc.)</p> <p>(2) Concession revenues: gross concession revenues by concession type; net concession revenues by type; minimum annual guarantee by concession location or lessee</p> <p>(3) Other: number and type of concessions; concession locations that will be available for lease by month; number of customer complaints by concession location</p>	Concession space per PAX, per EP, per O&D PAX; concession revenue (total, food and beverage, news and gift, advertising, services, other) per PAX, per EP, per O&D, per square foot of terminal space; non-airline revenue as a percentage of total revenue	Tenant self-reporting, lease summaries, point-of-sale systems; accounts receivable records	Manually, property management software systems or, occasionally, point-of-sale software systems	Monthly or specified events or levels reached	Daily when possible, otherwise monthly	Monitoring financial health, planning facilities issues, business development planning	FAA grant assurances under 49 CFR 47107, including restrictions on use of airport revenues and requirement for airport to set rates and lease charges to enhance airport's self-sufficiency

FUNCTIONAL AREA OPERATIONS

DIVISION AIRSIDE

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Business-critical information	Key data elements	Metrics	Data source	Capture method	Notification threshold	Capture frequency	Data uses	Regulatory and reporting requirements
Shift log	Summary of events over shift period, results of airfield inspections, Operations officer name, date, location, who notified, etc.	NA	Running narrative done by Operations officer	Manually and via software		By shift	Part of a mosaic of information that, when coupled with maintenance, police, fire, etc., provides whole picture of occurrences on airport	Required under Federal Aviation Regulations (FAR) Part 139 when included in operations handbook
Runway availability	Hours of availability for runways, jetways	Percentage of time runways are available for aircraft, percentage of jetways available for airline use, etc.	Staff notations	Manually		At least once each 8 hours	Monitor airfield efficiency and causes of delay, input for maintenance division action, information for senior management	
Equipment availability	Equipment designation (e.g., aircraft rescue and fire fighting truck 1, emergency generator 7, etc.)	In commission, out of commission	Fleet maintenance, FAA, direct observation	Manually and automated		Real time	Based on condition of equipment, redeployment of resources, lowering of airport class, issuing of NOTAM	
Weather data	Current and forecast weather conditions; wind velocity, snow and rain amounts, ice accumulation, temperatures, etc.	Ceiling and visibility that falls below prescribed minimums; weather conditions that trigger response plans; runway temperature sensors that indicate freezing conditions	U.S. Weather Service, flight service station, airline meteorological department, contract weather services, runway visual range, wind indicators, etc.	Tap into agencies' databases, visual observations, runway sensors	Prearranged criteria	Real time	Open/close airport, allocate resources, initiate pyramid alert system, deploy maintenance, etc.	
Airline schedules (arrival, departure)	Gate, airline, flight number, tail number, arrival and departure times	Ratio of scheduled arrivals and departures to actual (on-time arrival and departure)	FIDS, direct tie into airline databases, paper records, gate operations application software, OAG, FAA secondary radar	Varies by airport	Accessible by senior management	Real time	Planning for revenue from airline operations; staffing, facility maintenance, and many other items that are driven by the number of aircraft operations and O&D passengers	
Contractor performance	Contractor's name, contact information, on-site supervisor, contract terms regarding operations on the AOA, location of work to be performed	NA	Contact, CCTV, direct observation	Manually	Unsafe practices noted	When work is in progress	Contractor must comply with all rules and regulations pertaining to operation on the aircraft movement area. Fines and/or additional staffing added when necessary	Required by new FAA mandates for contractor compliance
Current airfield, terminal, and roadway conditions	Weather (wind, temperatures, rain, snow, ice), runway braking action, safety alerts; pavement temperatures, chill factor, etc.	Critical operating information	Actual observations; systems embedded in pavement that report temperature, ice accumulation, etc.	Direct observation	Accessible by senior management; unsafe condition immediate	Real time	Open or close airport, allocate additional resources, coordinate with public relations, etc.	

FUNCTIONAL AREA OPERATIONS

DIVISION LANDSIDE

Business-critical information	Key data elements	Metrics	Data source	Capture method	Notification threshold	Capture frequency	Data uses	Regulatory and reporting requirements
Information of import with a shift log that has been recorded by the operations officer over a shift period	Incidents listed	NA	Running narrative done by shift supervisor or operations officer	Manually or automated	Predefined events of import automatically or telephonically passed to senior management	By shift	Creates part of mosaic of information that, when coupled with similar records from maintenance, police, fire, etc., provides an accurate picture of occurrences on airport	May be regulatory (FAR Part 139) if included within the operations manual
Delays that occur at cashier booths, ticket counters, commercial vehicle lanes, and departure levels; occupancy levels of parking lots; TSA lines, FIS areas, etc.	Queuing times at parking entrance and exit lanes, ticket counters, concession areas, security check points, baggage claims, FIS area, etc.; parking lot name, lot capacity, current car count	Number of cars, passengers, customers, etc., multiplied by minutes of dwell time provides metric of delay time per minute, hour, or other unit	Parking facility count systems, roadway sensors, direct observation, CCTV, etc.	Manually or automated	Based on previously agreed-to criteria or the judgment of the operations officer	Real time	Allocation of resources, no-charge release of vehicles queuing at exit lanes when lines are too long; notification of applicable agency (TSA, customs, immigration, police, concession, etc.); coordination with PR; notification of higher authority (board chairperson, mayor, etc.)	
Public complaints, how or if conflict is resolved	Written and/or verbal complaints, severity of complaint, outcome, action taken	Number of complaints per shift, day, or other time period; degree of severity of complaint by time period; time in which to respond to complainant	Information counter, suggestion boxes, police reports, operations logs, citizens' direct contact with representative of the airport	Manually, sometimes via e-mail or automated	Prearranged criteria	Daily	Trend analysis; effectiveness of concession program, TSA, parking, etc.	
Current airfield, terminal, and roadway conditions	Snow accumulation, temperature, wind speed and direction, etc.	NA	Actual observations; systems embedded in pavement that report temperature, ice accumulation; airlines, FAA, U.S. Weather Service, etc.	Manually (direct observation) or automated	When deemed a condition that could affect airport operation	Real time	Open/dose airport, allocate additional resources, coordinate with PR, etc.	
Unauthorized entry onto the air operations area	Door or gate location, time of penetration, company and individual's name and authorization level, time to respond to violation, etc.	Number of violations per period, duration of penetration	CCTV, FIDS, controlled-access computerized systems and associated databases, direct observations, etc.	Visually or via computer sensors	Predefined events of import automatically or telephonically passed to senior management	Real time	TSA requires airports to control all access onto movement areas of an airport not exclusively leased to FAR Part 121 commercial carriers having a plan on file with the TSA. Failure to do so will result in fines and/or other legal penalties	CFR 49 Part 1542
Gate, apron, support equipment, and counter availability; particularly important in international arrivals facility or at airports that have common-use gates	Gate designation, gate capacity, apron configuration, gate schedules, airline arrival/departure information	Dwell times at gate, counters, etc.	CCTV, FIDS, direct observations, preexisting schedules, FAA secondary radar, telephone, direct contact with airline user, etc.	Manually or automated	Prearranged criteria	Ranges from 30 days to real time	Allocation of additional resources, coordination with other airlines to reallocate resources	
Utilization of facilities (gates, apron, 400 Hz, pre-conditioned air, ticket counters, FIS, etc.)	Duration of use, number of passengers, weight and type of aircraft, company name, domestic or international, signatory vs. non-signatory user, rate per use, etc.	Revenue and cost per passenger, per system, and per unit or location	CCTV, FIDS, direct observations, preexisting schedules, FAA secondary radar, telephone, direct contact with airline user, etc.	Manually or automated	When user fails to honor charges	Real time	Billing information; revenues generated from use of facilities used to retire debt, cover operating expenses, and meet debt coverage requirements. Finance uses data collected from terminal operations and compares it to costs associated with providing system or service	
Contractor's performance in non-aircraft-movement areas	Number of incidents	NA	Direct observation, engineering division	Manually	Predefined events of import automatically or telephonically passed to senior management	As noted	Contractors have the ability to block traffic, cut critical communications cables, or interrupt power at inopportune times. Close coordination with landside operations as well as engineering is essential	
Commercial vehicle movement through the terminal complex	Company name, date, vehicle number, time, per-trip charge, vehicle condition, insurance company name and amount of coverage, etc.	Cost per trip multiplied by number of trips per unit of time	AVI systems, ticket dispensers, cab starters, self reporting by companies under contract with airport, direct observation relating to condition, etc.	Manually, AVI, or via software (controlled-access card readers)	Company's failure to pay after a prescribed period of time; company attempts to serve airport without contractual or Public Utility Commission authorization	As vehicles arrive at the airport	For billing purposes, to ensure vehicles are safe and clean; for regulatory monitoring	Governmental agencies have the responsibility to license certain commercial vehicles for passenger transport, city, county, or state regulations

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FUNCTIONAL AREA OPERATIONS

DIVISION GROUND TRANSPORTATION

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Analysis and Recommendations for Developing Integrated Airport Information Systems

Business-critical information	Key data elements	Metrics	Data source	Capture method	Notification threshold	Capture frequency	Data uses	Regulatory and reporting requirements
Availability of ground transportation	(1) Traffic flow: taxi-cab, hotel shuttles, rental car shuttles, remote parking shuttles, limos (2) Availability: taxi-cab, hotel shuttles, rental car shuttles, remote parking shuttles, limos (3) Staffing and queuing of ground transportation (4) Weather: snow removal, closures, ice, etc.	Commercial vehicles available per period of time; wait times for taxis, shuttles, etc.	Direct observation, CCTV, AVI	Manually or automated	Prearranged criteria	Real time	Allocation of resources; documentation that requires providers to increase availability of units; answers to complaints regarding airport taxi service	State public utility commissions regulate quality and routing of commercial vehicles intrastate; the Interstate Commerce Commission (ICC) does the same for interstate activity
Employee bus frequency	Time between departures for employee bus transportation, employee parking, employee vehicles	Number of vehicles passing a point per period of time (headway)	Direct observation, CCTV, AVI	Manually or automated	Prearranged criteria	Real time	Data supplied to airlines to support additional resources in the form of rolling stock, vehicle capacity, head-way adjustment, etc.	
Congestion in commercial vehicle lanes	Commercial vehicle throughput number of vehicles in commercial holding lot	NA	Direct observation, CCTV, police reports, operations logs, AVI, controlled access systems, etc.	Manually or automated	Grid-lock condition	Real time	Planning, budgeting, negotiation with commercial vehicle operators	

FUNCTIONAL AREA OPERATIONS

DIVISION PARKING

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Business-critical information	Key data elements	Metrics	Data source	Capture method	Notification threshold	Capture frequency	Data uses	Regulatory and reporting requirements
Inventory	Number of spaces, number of cars, license plate, origin of car, location, car (date and time first noted)	Activity per parking lot, facility count system	Facility count systems, manual tabulation, CCTV, induction loop counters, video detection, ultrasonic counting devices, RF transmitters, space occupancy detectors	Manually or automated	Prearranged criteria		Decisions regarding alternate use of facilities, parking lot fill rates; press releases or airport radio station broadcasts	Security directives (Homeland Security)
Number of parking transactions processed	Transaction time, cashier inventory, and cash receipts	Revenue	Parking revenue control system, kiosks				Performance measure	
Time incidents	Queuing time, exit wait time, cashier wait time, roadway congestion, accidents causing wait times on and off airport, road conditions and closures, snow removal progress reports	Wait time for exit	Cashier reports, CCTV, roadway congestion	Cashier reports can be delayed until the end of shift and may not be real time; CCTV may provide real time; roadway congestion may be from other causes that require identification	Prearranged criteria	Real time	Decisions regarding increased staffing, redirection of public to alternative lots, press releases, airport AM broadcasting system programming, no charge lane openings	
Source of traffic delays		Wait times, expense	CCTV, roadway congestion, incident reports					
Passenger wait times for terminal bus, rental car		Wait time						
Transactions	Ticket transactions, transaction journals, audit trails, register's transaction log, number of cars (loop detector sensor), cash receipts, cash inventory	Revenue	Automated parking revenue control systems installed in each booth	Manually or automated	Prearranged criteria	By shift, or when automated real time	Parking revenues are largest single source of revenue other than airline charges; constant audit of cashier's activities is essential	
Sum of incidents by date, shift, and time		Problems per shift	Shift supervisor	Manual	Accessible by senior management	By shift	Creates part of mosaic of information that, when coupled with maintenance, police, fire, etc, provides accurate picture of occurrences on airport	

FUNCTIONAL AREA MAINTENANCE DIVISION FACILITY MAINTENANCE

Analysis and Recommendations for Developing Integrated Airport Information Systems

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Business-critical information	Key data elements	Metrics	Data source	Capture method	Notification threshold	Capture frequency	Data uses	Regulatory and reporting requirements
Work reported on shift logs that represents information of importance to senior management (e.g., major water leak)	Conditional variations from normal deemed significant	NA	Building maintenance, equipment sensors	Manually or via equipment sensors; if airport has centralized maintenance control that is manned 24/7, logs may originate from there	Accessible at all times or with prearranged criteria	By shift	Information that might impact airport operation, thus requiring additional resources	FAR Part 139 relating to airfield safety
Budget	Divisional expenditures by object code	Percentage above or below budget, cost to maintain per passenger per square foot of leasable space, cost per square foot	Budget documents, general ledger	Manually or automated	Prearranged criteria	Periodic	Measures efficiency of staff, alerts management that adjustments in expenditures may be necessary, etc.	
	Budget to actual (personnel)	Ratio of budget-to-actual expenditures (e.g., after 6 months, 44% of approved budget expended)	Budget documents, general ledger	Manually or automated	When threshold is exceeded	Periodic	Control costs, reallocate resources, etc.	
	Budget to actual (parts and material)	Ratio of budget-to-actual expenditures	Budget documents, general ledger	Manually or automated	When threshold is exceeded	Periodic	Same	
	Budget to actual (contract services)	Ratio of budget to actual expenditures	Budget documents, general ledger	Manually or automated	When threshold is exceeded	Periodic	Same	
	Budget to actual (capital, etc.)	Ratio of budget to actual expenditures	Budget documents, general ledger	Manually or automated	When threshold is exceeded	Periodic	Same	
Accident history	Number of accidents, severity of injury, cost per incident, OSHA violations	The number of accidents as a ratio of the number of employees engaged in a craft, workers' compensation claims compared to national standards; OSHA violations compared to other airports	HR databases; facility maintenance internal records; OSHA	Manually or automated	Prearranged criteria	When accident occurs	Implementation of training, changing of procedures, corrective action	OSHA
Personnel statistics	Number of positions filled, budgeted, approved	Percentage of positions filled	HR	Manually or automated	NA	By period	Used for budgeting and to determine when and if it is permissible to fill positions, etc.	
Training requirements and records of completion	Hours of training required by employee per period per skill level	Percentage complete	Training specialist within division, HR	Manually or automated	When federally mandated training has not been accomplished in the required time frame	As training is performed	Tracking progress of required training	
Preventive maintenance program	Number of items requiring inspection, frequency of inspection, name of agency qualified to perform inspections (e.g., perform inspections of such equipment as fire extinguishers, elevators, escalators, boilers, chillers, transformers, etc.)	Date inspection due compared to actual date, percentage complete, etc.	Databases maintained by maintenance	Manually via manufacturers' and craftsmen's recommendations; software programs that capture requirements and log completion	When maintenance is due	As work is completed	To ensure facility is maintained in a professional manner	
Utility usage	Period of use; unit of measurement (gallons, kilowatt hours, cubic feet, etc.)	Electricity, water, gas used per square foot, power factor, etc.	Meter readings, telemetry, etc.	Manually or automated	NA	Periodic	Used for billing purposes, used to track energy conservation measures, etc.	State regulations may require energy conservation programs with reporting requirements
Pending work orders	Total work orders, estimated time to complete, work requests, material on order	Ratio of work requests to pending work orders; ratio of work orders completed in current period compared to similar period one year prior; ratio of work order by craft compared to number of employees in particular section	Maintenance control, HR, industrial standards and manufacturers' recommendations delineating times required to complete specific tasks					
Status of critical equipment	Equipment designation, location, criticality classification, status (on/off), etc.	Percentage on line	Incident reports from maintenance staff	Manually or electronically monitored	When criteria are met	Real time if electronically controlled	Reallocate resources to correct malfunction	Specific equipment must be operational in accordance with FAA requirements. (e.g., emergency power for runways)

FUNCTIONAL AREA MAINTENANCE

DIVISION FLEET

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Business-critical information	Key data elements	Metrics	Data source	Capture method	Notification threshold	Capture frequency	Data uses	Regulatory and reporting requirements
In-commission rates by type of vehicle	Total number of vehicles, number out of commission, vehicle classification	Ratio of in-commission to total	Superintendent (fleet maintenance or designee)	Manually or automated	Agreed-to percentage out-of commission	Monthly	Effectiveness of maintenance program, staffing decisions	
Critical equipment status	Total number of vehicles defined as critical, number out of commission	NA	Superintendent (fleet maintenance or designee)	Manually or automated	Immediately if there is a problem	Daily	Add resources, affect operational status of airport (e.g., fire trucks affect type of aircraft that can use airport)	FAA requires that they and users of the airport be notified when critical equipment (airfield related) is not operational
Budget (budget-to-actual) parts, materials, capital, etc.	Dollars expended, date, dollars budgeted, etc.	Ratio of budgeted to actual	Various sources: time clocks, paper records, all flowing through either Finance or HR	Manually or automated	Prearranged criteria when parameters are exceeded	Daily	Monitor effectiveness of divisions	
Personnel statistics	Hours worked, labor rate, Federal Insurance Contributions Act (FICA), retirement contribution, positions approved, positions filled, etc.	Percent vacancy	HR database. Many airports have centralized time clocks which record and calculate data	Manually or automated		Daily	Labor represents close to 50% of an airport's operational budget. Senior management must be aware of trends regarding this cost center	
Contractual services: cost of services, expiration date, year-to-date expenditures, etc.	Company name, contract value, contract term, work description, etc.	Budget to actual	Finance	Manually or automated		Daily	Budget tracking	
Capital expenditures (rolling stock)	Budgeted amount, expenditures to date, etc.	Budget to actual	Finance	Manually or automated		Daily	Budget tracking	
Parts and material expenditures	Budgeted amount, expenditures to date, etc.	Budget to actual	Finance	Manually or automated		Daily	Budget tracking	
Positions filled, budgeted positions	Approved budgeted amount, positions filled	Percentage filled	Operations and maintenance budget	Approved forms maintained by HR	When request is made through HR for release of additional positions	Daily		
Approved vacancies for hire	Senior management's approved positions (may be different than approved budget)	NA	HR database, normally generated from senior management, sometimes external limits (e.g., agency-wide hiring freeze)	Approved forms maintained by HR	If limits exceeded, or if critical need arises for positions not approved	Daily	Senior management can control expenditures by opening/closing budgeted positions. Staff requires access to who they can/can't hire by position and number	
Unplanned downtime	Unforeseen mechanical problems		Incident reports, work requests, tenants, public, etc.	Manually	When operation of airport is adversely impacted	Daily	Allocation of additional resources	
Underutilized vehicles	Hours or miles driven	Utilization compared to industry standards	Fleet records	Manually	Analysis completed during budget cycle	Daily	Reduction in fleet size when utilization is below industry standards unless unique requirements exist	

FUNCTIONAL AREA MAINTENANCE

DIVISION MATERIALS

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Business-critical information	Key data elements	Metrics	Data source	Capture method	Notification threshold	Capture frequency	Data uses	Regulatory and reporting requirements
Inventory valuation	Warehouse units, value of each type of unit, bench stock inventory, date	Number of units multiplied by value	Supply inventories	Manually or automated	Exceeds previously agreed-to maximum amount	Real time if automated; periodically following semiannual audit	An effective supply system will balance the cost of material against the cost of delaying the repair/replacement of the item in question. Too high a valuation of inventory may indicate over-zealous purchasing or maintenance organization. Careful analysis of items on hand, time to acquire (pipe line), and reorder points will result in proper stock levels	
Accuracy of inventory	Valuation prior to manual inventory by commodity vs. actual valuation confirmed by inventory process	Comparison of results of perpetual inventory to physical inventory	Periodic or perpetual inventories	Manually	When limits (percentage variation) are not met	Semiannually	Records should be consistent with results of manual inventory conducted by an independent agency. If they are not, suspect theft, lack of training, or lack of resources. Because inventory of parts and material can be valued in the millions and can prove to be a political embarrassment, senior management must be aware and reactive when necessary	
Incidents reported on shift logs	Sum of incidents by date, shift, and time		Building maintenance	Manual reports; if airport has centralized maintenance control that is manned 24/7, logs may originate from there	When unusual condition occurs	By shift	Information that might impact operation of airport	
Budget to actual: personnel, contractual services, parts and material	Vendor management and analysis can pinpoint costly off-contract buying	Ratio of budgeted to actual	Finance		Accessible at all times	See above	Same	
Personnel statistics	Number of employees	Percentage vacancy	HR	Manually	When threshold is exceeded	Daily	Same	
Personnel statistics	Approved vacancies for hire	Comparison of approved positions to budgeted positions	HR	Manually	When threshold is exceeded	Daily	Same	
Excess or obsolete inventory	Inventory transactions, carrying costs, invoice/purchase order	Time in inventory without activity	Finance and/or supply	Manually or via software	Exceeds predefined inventory levels based on maintenance schedule	Daily	If inventory is not being used after a period of time, disposal of item is appropriate	

FUNCTIONAL AREA MAINTENANCE DIVISION MAINTENANCE CONTROL

Business-critical information	Key data elements	Metrics	Data source	Capture method	Notification threshold	Capture frequency	Data uses	Regulatory and reporting requirements
Established priority policy (e.g., airfield safety, terminal public areas)		NA	Priorities usually are established by senior management and provide direction for the scheduling of resources	One-time policy statement	NA	One time, amended as needed	Policy statement used to describe priorities set by senior management	None
Number of systems maintained	Bag claim conveyors, matrix readers, parking ticket spitters, parking toll booths, etc.	NA						None
Total work orders in progress, status, time to completion, etc.	Work order, number, description of task, date initiated, estimated time to complete, work orders completed per staff	Ratio of pending work orders to those completed during a period of time, etc.	Manually and/or via automated work-order system		Should be accessible but not flagged	By shift	Measurement of effectiveness of each division of maintenance	None
Incidents from shift logs (incidents that occurred over an 8-hour period gathered from the perspectives of different divisions)		NA	Entered by supervisor on duty; may be in retrievable flat file format or in written log	By shift	Should be accessible but not flagged	By shift	Provides a mosaic of information that, when coupled with other operational logs, keeps senior management informed as to what is happening on airport	None
Safety related work orders	Work order number, description, anticipated completion date	NA			Prearranged criteria	Immediate		None
Airfield, terminal, roadway status that might impact airport operation	Runway status, roadway status, status of various parts of terminal	NA	Originates initially from division level but flows to maintenance control for scheduling and implementation		When criteria for notification are met	Immediate	Any maintenance-related activity that affects airport operation should be made known to senior management	None
Upcoming maintenance events	Preventive maintenance schedule		Manually or via software	Manually and via software				None
Service delivery	Service deadlines	NA	Manually or via software	Manually and via software				None
Expiring agreements; service over/under expected level	Service level agreements	Expiration date of contract compared to current date	Manually or via software	Manually and via software	As expiration date approaches	Daily	To ensure replacement contracts are in place, early notification is essential	None

FUNCTIONAL AREA ENGINEERING

DIVISION DESIGN/CONSTRUCTION

Business-critical information	Key data elements	Metrics	Data source	Capture method	Notification threshold	Capture frequency	Data uses	Regulatory and reporting requirements
CIP	Project numbers, description, engineer's estimates, source of funding, change orders, etc.	Percentage complete, current status to budget, status of budgeted federal funding level to current projection, engineer's estimate to actual	Engineering and Finance	Manually and via software; numerous programs are available for tracking projects	NA	Revised as new events occur (e.g., bid opening, change orders, etc.)	Provides management with a schedule of projects in progress and a snapshot of program status compared to budget; alerts management to program/project problems	Indirectly required by FAA for projects that require federal funding
Construction and design schedules	Original estimate, current projection, liquidated damage/bonus provisions	Cost per calendar day to accelerate project	Contract (contractor, architect, or engineer); specifications; field engineer's estimates; capital budget, etc.	Manually and via software	Prearranged criteria	As necessary	One project frequently works in conjunction with other parts of a capital program. A delay can have serious consequences to an overall capital program. Awareness permits necessary adjustments	
FAA grant status; state and local, if applicable	Project description, grant approval (yes/no), percentage funded, funds received to date	Ratio of federal funding to total cost of project, ratio of original plan of finance, projections for federal funding to current anticipated funding	FAA, congressional delegation, airports lobbyists, bids, and expenditures to date on federally funded projects	Manually and via software	Notification is not always triggered by an event instead, senior management can access data as necessary	As changes occur	Senior management must reallocate resources, reset airport priorities, consider additional sources of funding or expand scope of project, and initiate negotiations with tenants as federal or state funding availability ebbs and flows	
Change orders (approved, pending, disapproved)	Project number, change order number, price of change, status (approved, disapproved, pending), original requestor, scale of importance	Ratio (percentage) of the sum of all change orders in project-to-base contract price	Originated from one of several sources: tenant, engineering group, field engineer, FAA (regulatory change), etc.	Manually	When total value of change orders for a project exceeds an established value, senior management is notified	As proposed	Funding of change orders must be determined and budgets adjusted accordingly	Change orders sometimes generated by new local, state, or federal requirements. Changes sometimes eligible for federal funding
Construction and design contracts, grant requests, and other obligations of the airport that require approval from higher authority (e.g., council, board). Schedules for such submissions should be available to senior management	Name and action required for project, grant, contract, etc.		Engineering design and construction		Notification is not triggered by an event; instead, senior management can access data as necessary	As new information becomes available	All airports must seek approval from higher authority for significant expenditures or commitments for funding. Scheduling for approval on a timely bases is important	
Plans, specifications, utility depiction, legal descriptions (metes and bounds, etc.) Documents frequently written using CAD software	Digitized points, plans, alphanumeric	Infinite potential using CAD (e.g., when terminal building physical characteristics are digitized, calculation of square feet within any given boundary is easily calculated)	Existing plans and specifications, contractor's drawings, manufacturers, master plans, etc.	CAD captured through scanning process; drawings captured through drafting techniques				
Engineering-related critical items (e.g., federal, state, and local regulations mandate corrective action for discrepancies deemed unsafe or environmentally unacceptable)	Project name, description of requirement, estimated completion date, etc.		Engineering design and construction	Manually and via software	When engineering decides a project might impact the operational capability of the airport; when it is believed that established deadlines cannot be met	As new information becomes available	If corrective action is necessary: (1) Notification of public relations (2) Allocation of additional funding, if required (3) Allocation of human resources, as necessary (4) Notification of superiors, when appropriate. (e.g., mayor, chairman, etc.)	

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FUNCTIONAL AREA ENGINEERING

DIVISION ENVIRONMENTAL

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Business-critical information	Key data elements	Metrics	Data source	Capture method	Notification threshold	Capture frequency	Data uses	Regulatory and reporting requirements
Flight tracking information	Flight number, altitude, location, company name, etc.	NA	Near-real-time flight-tracking software that ties into FAA's secondary radar system	Automated	Available for access	Near real time; may be delayed by federal law	Enables senior management to respond to questions posed by higher authorities and citizens regarding flights and noise	
The number of noise violations based on FAA Part 150 criteria	Digitized noise contour maps, single-event and multiple-event decibel levels, flight number, altitude, location, company name, etc.	Number of events per quarter, per year; duration of violation over maximum allowed decibels	Devices installed on and around airports that display flight activity and single-event noise levels that occur during aircraft passage; public complaints; FAA radar	Normally captured from field sensors; can be uploaded into computerized systems that can make necessary calculations	Prearranged criteria	Real time	Depends on arrangements made with federal, state, and local governments. If the airport completed a Part 150 study, mitigation requirements mandate corrective action be taken if noise levels exceed parameters established in the Part 150 document	If the airport completed a Part 150 study, regulations require that flight tracks be followed when practical and that other mitigation steps be followed in accordance with the plan
Noise complaints	Number of public inquiries on noise issues; number of noise complaints by area	Percentage of public inquiries on noise issues responded to within 10 business days of inquiry; percentage increase/decrease in noise complaints	In-person, email, or recorded phone messages	Manually, automated, or both		As notification occurs	Information indicates if airlines and/or FAA controllers are operating within the Part 150 plan whenever practical	
Water-quality or air-quality compliance	Information is collected, sometimes with sensors or with actual measurements taken by staff	Water, air, and/or noise measurements out of tolerances established by regulation, permits, etc.; status of corrective actions	Storm sewer, potable water, air sampling devices, etc.	Manually or automated	When significant violation occurs (e.g., fuel spill, deicing chemical introduced into navigable waterway)	Real time	Notification of public relations division and senior officials; corrective actions initiated to correct violation	Environmental Protection Agency (EPA), Corps of Engineers, and some state agencies require that levels of contamination not be exceeded and that, if they are, event is reported and corrective action is taken

FUNCTIONAL AREA ENGINEERING

DIVISION PLANNING

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Business-critical information	Key data elements	Metrics	Data source	Capture method	Notification threshold	Capture frequency	Data uses	Regulatory and reporting requirements
Forecast data	Current enplanements; aircraft operations; vehicles on roadway; parking occupancy; passengers by terminal by 15-minute segment, etc.; maximum airfield practical annual capacities (PANCAP); maximum number of cars on roadway per 15-minute segment; maximum throughput per 15 minutes in terminal; peak parking occupancy possible per 15 minutes; utility capacities (water, gas, electric, sewage, storm water); forecast enplanements and aircraft operations; future parking requirements; utility requirements; terminal requirements; and roadway needs	Percentage anticipated rate of growth in enplanements, aircraft operations, passengers, vehicles, etc., over forecast period	Forecasts come from the following sources: master plan, plan of finance, capital improvement program, Part 150 study, FAA forecasts, chamber of commerce forecasts, Department of Commerce, airline forecasts, etc.	Manually and via software	NA	As required	Forecasts of enplaned passengers, aircraft operations, parking lot occupancy, roadway peak hour congestion, etc.; development of capital improvement programs, including financial requirements and program feasibility	
Development permits	Number of development permits reviewed for aviation impacts	Number and type of developments with potential airfield impact	From tenants and city/county building permit databases	Manually or via digitized media			Construction on and around an airport provides information that can impact how much land must be acquired for noise mitigation, whether new areas of the airport should be developed for airside and land access, and whether demand for facilities warrants adjustment in ground rental rates	FAA requires airport construction projects that might impact the airfield to be vetted by issuing a Notice of Proposed Construction. Provisions within an FAA-approved Part 150 study may require mitigation when and if encroachment occurs within certain noise boundaries
Current airport layout plan (ALP)	Depiction of runways, taxiway, Wind Rose, planned land uses; existing and planned physical facilities	NA	Master plan, planimetric data bases, photography, National Weather Service, FAA, etc.	Digitized or manually retrieved from plans, surveys, aerial photos, etc.	NA	As required by the FAA	The airport layout plan is a depiction of land use on an airport and usually reflects current revisions of the airport's master plan	For an airport to receive federal funds, a current ALP must be on file with the FAA

FUNCTIONAL AREA SECURITY

Business-critical information	Key data elements	Metrics	Data source	Capture method	Notification threshold	Capture frequency	Data uses	Regulatory and reporting requirements
Police/LEO								
Shift log/incident or significant law enforcement activity	Incident or significant law enforcement activity	Critical information	Shift log/incident or daily police reports	Manually	As requested or as needed	Daily	Ensure safe operation of facilities; part of the mosaic of information depicting the state of the airport	
Training records	Successful completion of required training	Total hours per employee spent in training per required subject	Personnel records	Manually or via training tracking software	When required training has not been accomplished	Daily	Training sometimes is required to qualify police officer as an LEO; management must ensure this effort is accomplished	Training is specified by state statute
Passenger bag screening/TSA issues (airport security coordinates and monitors)								
Screening wait times and delays	Length of passenger wait times by screening location by hour; number of open (manned) screening stations by hour; TSA staffing levels by hour and location	Passenger wait times	TSA, airport terminal operations, passenger services	Manually by airport personnel; TSA reporting	As requested or as needed based on established threshold	Hourly; TSA reporting daily or weekly	Facilities and operational planning; monitor and solve customer service issues; gather data for federal funding lobbying	Regulations and directives from DHS/TSA
U.S. Customs and Border Protection (CBP) or Immigration and Customs Enforcement issues (airport security coordinates and monitors)								
Processing wait times and delays for international arrivals	Length of international passenger wait times for processing per hour; number of open (manned) customs and immigration processing stations per hour	International arrivals delays	Customs and immigration, operations, passenger services	Manually	As requested or as needed based on established threshold	As needed	Facilities and operational planning; monitor and solve customer service issues; gather data for federal funding lobbying	
Homeland/Airport Security								
DHS alerts	Contacts by TSA/DHS	Critical information	TSA staff or industry alerts	Manually				
New security directives (major changes)	TSA/DHS directives; proposed changes to approved security plan	Percentage impact to budget; operational impacts	TSA staff or industry alerts	Manually	As requested or as needed based on established threshold	As needed	Maintain safety for passengers and staff; planning or operational changes to accommodate while maintaining passenger flow	Regulations and directives from DHS/TSA
Breach of access or perimeter control systems	Details of breach (who, where, when, and how)	Operational and financial impact	Access control systems, perimeter control systems, security camera analytics	Manually and via system software (smart-card-enabled badges), video, infrared	Immediate	Immediate	Maintain safety for passengers, staff, and facility; address passenger flow issues	Regulations and directives from DHS/TSA, DOT, FAA

FUNCTIONAL AREA PUBLIC RELATIONS

Business-critical information	Key data elements	Metrics	Data source	Capture method	Notification threshold	Capture frequency	Data uses	Regulatory and reporting requirements
Customer Service								
Complaints by issue	Number of customer complaints by issue	Trends, complaints per airport process	Passenger service records and complaint-tracking systems	Manually or via customer service software systems	As requested	Regularly as needed	Monitor and solve customer service and safety issues; reduce passenger frustration (primary customer service concern of airports)	
Media								
Media contacts and issues	Media phone contacts by issue	Trends	Contact log	Manually	As requested	Regularly as needed	Monitor and resolve public relations and customer issues	
Air Service Development								
Airline requests for new or expanded facilities	Letters or calls regarding new or expanded facilities by airline	Usage (turns per gate) by airline; return on investment of new facilities; airport-caused delays resulting from facilities or equipment problems	Air service development contacts	Manually or automated	As requested	Regularly as needed	Facilities planning, operational issues, CIP financing issues, operations and maintenance budgeting	DOT Competition Plan (required for large airports)
Quality of community airline service	Number of airlines, airline routes and frequencies, aircraft types and fleet mix, airline competition and airfares	Changes in airline service per period	Staff or consultants reports, operations division reports, industry newsletters and study data	Manually	As requested	Regularly as needed	Planning, operational improvement review, community reporting	DOT Competition Plan (required for large airports)
Governmental Relations								
New or pending aviation legislation or regulations	New federal legislation; new federal regulations or notices of rule-making affecting aviation	Potential impact analysis, trend analysis	Industry emails, newsletters, alerts to government affairs staff	Manually and via email	As requested or as needed	As needed	Planning, budgeting, managing industry changes	

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FUNCTIONAL AREA FINANCE AND ADMINISTRATION DIVISION ACCOUNTING

Business-critical information	Key data elements	Metrics	Data source	Capture method	Notification threshold	Capture frequency	Data uses	Regulatory and reporting requirements
Expenditures (actual to budget)	Expenditures by object code and budgets by object code (by division)	Operating expenditures and capital expenditures per passenger (PAX), enplaned passenger (EP), origin and destination (O&D) passenger, operation, employee	Accounts payable records and budget documents	Manually or via financial software	Monthly reports, established variance levels	Regularly as required (daily, monthly, etc.)	Maintain financial health (adjust rates and charges as necessary, financial planning, budgeting); airport management should monitor and document expenditures of airport revenues and request independent auditor to review compliance with FAA grant assurances	FAA grant assurances under 49 CFR 47107, including restrictions on use of airport revenues and requirement for airport to set rates and lease charges to enhance airport's self-sufficiency
Revenue (actual to budget)	All revenues by source; budget forecasts by source; sources of revenues (components) include: (1) Non-airline/other: other-interest income; federal and state grants; commercial paper and debt proceeds; security reimbursement from Transportation Security Administration (TSA), non-airline (concession revenue, parking revenue, rental car facility revenue, commercial development revenue) (2) Airline: airfield ramp and service charges, landing fees, building and ground rental revenue, terminal rent and charges, passenger facility charges (PFCs), fuel charges and taxes	Gross revenue per PAX, EP, O&D, operation, employee Concession revenue per PAX, EP, O&D, square footage of leased space Airline revenue as percentage of gross revenue Non-airline revenue as a percentage of gross revenue Parking revenue per EP, O&D, parking space Ground transportation revenue per EP, O&D, employee	Accounts receivable records and budget documents	Manually or via financial software	Monthly reports, established trigger levels	Regularly as required (daily, monthly, etc.)	Maintain financial health; determine rates and charges; authorize new expenditures	FAA grant assurances under 49 CFR 47107, including restrictions on use of airport revenues and requirement for airport to set rates and lease charges to enhance airport's self-sufficiency
Reserve fund levels	Operating, capital, bond, or debt reserves	Bond covenant requirements	Financial management system; audited financials	Manually or via financial software	Monthly reports; established trigger levels	Regularly as required (daily, monthly, etc.)	Maintain financial health; determine rates and charges; authorize new expenditures; ensure compliance with bond covenants	Bond offerings or trust indentures (United States Securities and Exchange Commission [SEC] oversight)
Accounts receivable	Amount of accounts receivable by carrier; percentage of accounts receivable 90 days past due; results of collection efforts	NA	Accounts receivable records and budget documents	Manually or via financial software	Monthly reports; established trigger levels	Regularly as required (daily, monthly, etc.)	Maintain financial health; determine rates and charges; authorize new expenditures; ensure compliance with bond covenants	
Annual budget(s)	Total operating budget; capital budget and annual debt service requirements	Expected total cost per enplanement, per PAX, expected operating revenues-to-debt service ratio (debt service coverage)	Accounting division records; financial management software	Manually or via financial software	Annually and when threshold of increase or decrease occurs		Maintain financial health; determine rates and charges; authorize new expenditures	
	Total debt; percentage of variable rate debt; bonding rating	Debt-to-capital ratio; debt per EP; debt-to-revenue ratio	Accounting division records; financial advisor reports; rating agencies	Manually	Annually and when threshold of increase or decrease occurs		Maintain financial health; determine rates and charges; authorize new expenditures; ensure compliance with bond covenants	Bond offerings or trust indentures; SEC disclosure requirements

FUNCTIONAL AREA FINANCE AND ADMINISTRATION DIVISION OF ACCOUNTING

Business-critical information	Key data elements	Metrics	Data source	Capture method	Notification threshold	Capture frequency	Data uses	Regulatory and reporting requirements
Key rates and charges	(1) Landing fee: components of the key data (assuming residual rate-making) are airfield operating and maintenance costs from budget source, annual airfield debt service, miscellaneous airfield revenues by source, number of estimated aircraft landings by certificated weight. (2) Terminal rental rate components of the key data are terminal complex square footage by category (such as airline leasable, concession, public, etc.), terminal complex operating and maintenance costs from budget sources; budget forecasted terminal complex revenues by source	All metrics using airline costs (cost per enplanement, airline revenue as a percentage of total revenue, etc.) will use these airline rates and charges as a base	Accounting division records; financial management software; planning subdivision analyses	Manually or via financial software	When developed or changed (usually annually or semiannually)		Basis of all charges to airlines	FAA grant assurances under 49 CFR 47107, including restrictions on use of airport revenues and requirement for airport to set rates and lease charges to enhance airport's self-sufficiency
Plan of finance for capital projects	(1) Anticipated project costs by project(s); estimated design/construction cost; other anticipated costs including financing costs (2) Project funding by source: anticipated federal grants and PFCs; interest earnings anticipated during construction; debt to be issued, cash, etc. (3) Feasibility: forecasted annual gross revenues during feasibility period	Debt-to-capital ratio; debt per EP; debt-to-revenue ratio; projected impact on cost per enplanement; coverage ratios	Financial and feasibility studies	Manually or via financial software	As necessary for capital improvement financing; when developed or changed		Required to issue debt; provides framework for funding decisions; allows manager to monitor financial needs; is basis of sources and uses analyses	Bond offerings or trust indentures; SEC disclosure requirements
Advance warning of a possible air carrier bankruptcy	Financial reports on airlines; overdue account receivables; substantial decrease in passenger traffic or air operations; costs per enplanement by airline; market share analyses		Airline financial reports (SEC reports); consultant reports; account receivable and cost per enplanement reports from accounting; activity reports from operations division (passenger and flight operations)	Manually from financial information on airlines	Monthly or as requested		Substantial decrease in passenger traffic or air operations can have significant financial impact on airport. Higher risk where costs per enplanement are higher or where one major carrier has dominant market share; impact on properties and facilities and on accounts receivables	Bankruptcy law
Traffic statistics	(1) PAX data: total passengers; EP; deplaned passengers; connecting passengers by airline; O&D passengers by airline (2) Operations data: aircraft landings by aircraft type; aircraft departures by aircraft type; total aircraft operations; aircraft gate usage (turns) by airline; aircraft gate usage by type of equipment, on-time arrivals/departures by aircraft; deicing time	All metrics using passenger counts (PAX, EP, O&D), aircraft operations (landings, takeoffs, total aircraft), or gate usage (operations per gate)	Airline self-reporting; operations records of aircraft landings and departures; gate management systems; financial billings	Manually from airline self-reporting; operations records of aircraft landings and departures; gate management and financial management systems	Monthly reports		Provides enplanement and aircraft operations data for monitoring and planning facilities issues (e.g., capacity, usage, financial efficiencies, etc.)	

FUNCTIONAL AREA FINANCE AND ADMINISTRATION

DIVISION ADMINISTRATION

Business-critical information	Key data elements	Metrics	Data source	Capture method	Notification threshold	Capture frequency	Data uses	Regulatory and reporting requirements
Purchasing information	(1) Requisitions by budgeted amount, actual cost, time in process (2) Contracts for major services by expiration date, budgeted amount, actual cost	Efficiency metrics, such as operating costs per employee, cost of delay in acquiring goods or services	Contract and purchase tracking records	Manually or via purchasing software systems	Monthly reports	Regularly as set by management; daily in large airports	Monitor readiness and efficiency of airport departments; operational planning and budgeting	
Competitiveness of airport	Sampling of rates/fees at similar airports, such as landing fees, terminal rent per square foot, baggage system fees, train fees, costs per enplaned passenger, operating costs per employee	Comparative metrics, cost per enplanement, landings fees, etc., to gauge strength of competition for air service	Airport industry benchmarking surveys, staff research, airline reports	Manually	As requested by management	Sporadically	Monitor strength of airport competitiveness for air service (particularly for new low-cost service, connecting/hubbing service, and international air service)	DOT Competition Plan (required for large airports)
Risk and safety information	Accident rates by division; insurance claims by number and amount; injuries by type; vehicle damage by type and amount; workers' comp claims by type and amount; trend graphs	Costs per accident; injury rates per activity; injury/accident trends	Risk and insurance records	Manually or via software that tracks accidents and injuries	Monthly reports; significant events as established by management	As needed	Monitor trends and data to ensure safe facilities and operations; budget impacts	

FUNCTIONAL AREA FINANCE AND ADMINISTRATION

DIVISION HUMAN RECOURSES

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Analysis and Recommendations for Developing Integrated Airport Information Systems

Business-critical information	Key data elements	Metrics	Data source	Capture method	Notification threshold	Capture frequency	Data uses	Regulatory and reporting requirements
Personnel statistics	Personnel budget (total and by division); budgeted full-time employee positions (total and by division); filled full-time employee positions (total and by division); contract employee positions (total and by division); actual overtime-to-budgeted	Total annual PAX per full-time employee; labor cost per full-time employee; maintenance expense per full-time employee; non-airline revenue per full-time employee; operating net revenues per full-time employee; revenue per full-time employee; total airport cost per full-time employee	HR records	Manually and via HR software systems	Monthly reports	Regularly as needed	Monitor efficiency, use of human resources, budgeting	
Training performance measures	Number of on-site employee training classes, average class evaluation rating, compliance training	Training costs per full-time employee; compliance training by employee	HR records	Manually and via HR software systems	Monthly reports	Regularly as needed	Monitor efficiency, use of human resources, budgeting	Compliance with FAA, TSA, DOT CDL requirements, Occupational Safety and Health Administration (OSHA)
Personnel actions	Grievances; turnover; personnel actions (disciplinary, drug and safety test results, etc.)	Turnover ratios; costs of turnover per new employee; trends of significant personnel actions	Finance and/or HR records	Via finance and HR software systems	Monthly reports	Regularly as needed	Monitor efficiency, use of human resources, budgeting	Federal and state labor laws, DOT CDL regulations, FAA

Appendix C

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Appendix D

PRELIMINARY INTERVIEW LIST – ACRP 01-03

Carter Morris, Senior Vice President, Transportation Security Policy, AAE and Spencer Dickerson, President, Training and Technical Services Division, AAE

Question	Rationale
Other industries have been working on standards of communication between types of systems otherwise known as Application Programming Interfaces (APIs). Are there aviation standards for communicating data between software systems at an airport.	Determine if there are any gaps in our data collection to date?
Are there any standardized naming conventions for airports similar to airlines? (e.g., airports use and call a fee for passenger getting on the airplane many different things such as a passenger fee or an enplaning fee or public use fee?) For example, IATA has a ground handling manual that sets an industry benchmark, recognized worldwide, for information processes and flows (for example to ensure equipment names are consistent and that ground handling of an airplane follows consistent procedures). MAGSA has something similar for aviation service providers (vendors). Do you know of anything similar to this for an airport, aside from what IATA has already published?	Determine if there are any gaps in our data collection to date.
Is there any document that you know of that details out what the key data elements are for the functional areas of an airport and the business critical information that a manager would want to know? If so, can you point us in that direction?	Additional validation of the key data elements and business critical information we have developed.
In your experience, based on how involved the AAE is in integration standards, what are the pros and cons of integration for small to medium airports? What are the benefits and negative aspects?	We did not find anything on integration on pros and cons to small and medium airports and this would help us validate.
During your work with airports of all sizes, have you seen significant differences in what airport consider business critical information that seem related to the size of the airport?	Validate business critical information and determine if this differs by size.
What are the most significant IT software integration issues you have encountered or that have been relayed to you by airport managers?	Determine state of the industry and lessons learned.
During the work you led on the Registered Traveler common platform, what lessons were learned that might help airports integrate their systems?	Determine lessons learned.
Recommend two airports that we should consider interviewing about their successes in integrating data or their IT innovations.	Determine gaps in our interviews.
What integration issues have been the primary concerns of airports?	Determine state of the industry.
From your work with airports, what are the things that have worked in the area of data integration? What efforts have failed, and why?	Determine lessons learned.
In the course of developing the web based training programs at AAE what difficulties did you encounter and how were they solved?	Transfer lessons learned from other fields.
Has AAE developed any studies or “white papers” that would assist an airport in IT integration? In benchmarking airport business metrics? In developing specs for procurement of IT systems?	Identifying gaps in our research.

Appendix D

Richard (Dick) Marchi – Senior Advisor, Center for Policy and Regulatory Affairs – ACI-NA

Question	Rationale
Please recommend one or two airports we should consider interviewing due to their successes in the area of integration.	To supplement our findings of model airports and ensure we have not missed one that is very progressive.
What is the SITA and AIRINC involvement in the new XML standard? Are there any other standards? What is the difference between the new XML standard and other standards published by ISO and OASIS?	Determine the rationale behind developing the XML standards and the benefits of the new standards that the taskforce is working on to the airport operator
Are there any other integration technology standards for airports that you know about, aside from XML and CUPPS?	Determine if there are integration standards that we did not find in our research.
Have airports been able to create additional layers in the digitization of the physical properties of the airport to include such things as mechanical systems and their associated preventive maintenance requirements, electrical distribution systems and plumbing systems with online status monitoring? What airports have successfully integrated the engineering department's computer aided design capability with that of the real estate (Properties) division? Have any airports extended the Engineering Department CAD system to include maintenance activities.	Determine if there is any new integration technology being explored that we have not uncovered.
As it relates to the field of civil engineering, what packages have been used with success by airports for managing a Capital Improvement Program? Are there any that come to mind which integrate the traditional Program Management function with the airports overall Financial Management System?	These areas update the Capital Improvement Program to the budget to create an actual real time working plan
We have done a lot of research worldwide regarding integration. Who do you think are the top three countries that are most advanced? Why?	Get feedback to validate our international data.
What are your thoughts on which systems generate the highest return on investment, and improve the deliver of business critical information and the efficiency for small to medium airports?	Validate scalability.
Is the XML standard being tested on the legacy systems and how successful has that been?	Determine compatibility.

Thomas Romig - Manager Airports IT – ACI World

Question	Rationale
Have you seen other airports, aside from DIA, developing their own integration standards?	Find out if we have missed any airports successfully implementing integration standards.
What other airports are “tinkering with their own little boxes” that is customizing their integration? What have been the successes and lessons learned?	Determine if there are more lessons learned we can add to our findings.
What is the progress of the CUPPS system? How widely received is it?	Determine the status of the CUPPS integration?
What are the benefits of CUPPS—particularly to small, medium, or non-common use airports?	Determine the particular benefits foreseen for CUPPS.
Other industries have been working on standards of communication between types of systems otherwise known as Application Programming Interfaces (APIs). Are there aviation standards for communicating data between software systems at an airport?	Determine if there are any gaps in our data collection to date?

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Question	Rationale
<p>Are there any standardized naming conventions for airports similar to airlines? (e.g., airports use and call a fee for passenger getting on the airplane many different things such as a passenger fee or an enplaning fee or public use fee?) For example, IATA has a ground handling manual that sets an industry benchmark, recognized worldwide, for information processes and flows (for example to ensure equipment names are consistent and that ground handling of an airplane follows consistent procedures). MAGSA has something similar for aviation service providers (vendors). Do you know of anything similar to this for an airport, aside from what IATA has already published?</p>	<p>Determine if there are any gaps in our data collection to date.</p>
<p>Is there any document that you know of that details out what the key data elements are for the functional areas of an airport and the business critical information that a manager would want to know? If so, can you point us in that direction?</p>	<p>Additional validation of the key data elements and business critical information we have developed.</p>
<p>In your experience, based on how involved the ACI is in integration standards, what are the pros and cons of integration for small to medium airports? What are the benefits and negative aspects?</p>	<p>We did not find anything on integration on pros and cons to small and medium airports and this would help us validate.</p>

John Belcher - CEO – ARINC

Question	Rationale
<p>Please describe the different products that you offer to airports.</p>	<p>This is a “warm up” question to get them comfortable talking to us.</p>
<p>ARINC is working on the Task Force for Industry XML data integration standards. Is ARINC working on other similar industry data integration technologies?</p>	<p>Learn what other industry standards may be coming.</p>
<p>What changes should airports expect as a result of the introduction of these standards?</p>	<p>Learn what other industry standards may be coming.</p>
<p>Other industries have been working on standards of communication between types of systems otherwise known as Application Programming Interfaces (APIs). Are there aviation standards for communicating data between software systems at an airport?</p>	<p>Determine if there are any gaps in our data collection to date.</p>
<p>Are there any standardized naming conventions for airports similar to airlines? (e.g., airports use and call a fee for passenger getting on the airplane many different things such as a passenger fee or an enplaning fee or public use fee?) For example, IATA has a ground handling manual that sets an industry benchmark, recognized worldwide, for information processes and flows (for example to ensure equipment names are consistent and that ground handling of an airplane follows consistent procedures). MAGSA has something similar for aviation service providers (vendors). Do you know of anything similar to this for an airport, aside from what IATA has already published?</p>	<p>Determine if there are any gaps in our data collection to date.</p>
<p>Is there any document that you know of that details out what the key data elements are for the functional areas of an airport and the business critical information that a manager would want to know? If so, can you point us in that direction?</p>	<p>Additional validation of the key data elements and business critical information we have developed.</p>

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Question	Rationale
In your experience, based on how involved the ACI is in integration standards, what are the pros and cons of integration for small to medium airports? What are the benefits and negative aspects?	We did not find anything on integration on pros and cons to small and medium airports and this would help us validate.
How would SITA and ARINC benefit from an "airport XML standard"? Throughout the typex white paper, the XML schema specifications are mentioned, would these be considered mostly for "airline legacy systems"? The quote below indicates the open protocol would immediately benefit the newer applications, why? How does this apply to an airport's architectural infrastructure? "The Air Transport Industry (ATI) will reap several specific benefits of the new technology as it is adopted over time as a future replacement for Type B messaging. Key benefits will most immediately accrue to new applications, and then eventually to legacy applications as they migrate to newer platforms. "	Determine vendor benefits to developing XML standards when they have their own standards.
What is the difference between this "new XML standard" and the other standards already published by ISO and OASIS? Why reinvent the wheel? Is this open standard better than the others or just built more on an aviation standard?	Determine the differences between industries and the standards that they set.

Robert Duncan – Director - Indianapolis International Airport

Question	Rationale
What are the areas of information that you need to make critical business decisions?	Validate the business critical information we have identified and fill in gaps.
What systems and sub-systems do you use to process data into business-critical information?	Validate systems and subsystems and how they work together.
Where are the key metrics that you use to measure how your airport is functioning: its efficiency, productivity, operations or financial health?	Validate that we have identified all the key metrics.
What are your top priorities for business-critical information?	Validate the business critical information and determine priorities of business critical information.
What deficiencies have you identified in the systems and procedures in place at your airport for collecting, processing, analyzing and reporting of your business critical information?	Validate and increase our knowledge of lessons learned.
Do you have a success story or best practice you would like to share in this regard? In the area of integration?	Validate and increase our knowledge of best practices. Determine state of the art in the industry.
Have you and/or your staff identified areas of redundant data collection or data entry or manual data collection which could be eliminated with an improvement in the integration of systems?	Validate our identification of redundant and manual data collection.
What information would you want on a desktop "dashboard" to help you make quicker, more informed business decisions?	Validate priorities of business critical information and develop our handbook to ensure its ultimate usefulness.
What has been the biggest challenge that you have faced in integrating your systems?	Validate our information and findings.
Have you created your own integration language or systems? If so what and how is this working out? Why did you create your own? What were the roles of vendors?	Find out what airports have done in integration.

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Question	Rationale
When airports purchase a system that already has the functions of another system, why purchase the other system (e.g., purchasing a gate management system which already contains a maintenance function in that gate management system, why then purchase a maintenance system)?	Determine the value of overlapping systems.
If you were to give a small to medium airport advice, what would be the top five things?	Fill in gaps for small to medium airport integration.
What do you think of information technology standards? Are you aware of any?	Validate our findings.
If there were integration technology standards, how would these benefit the airports overall?	Validate our findings.
What manual processes still exist in the airport? Where do you see redundant data collection? How would you address these areas?	Validate our findings on manual and redundant data collection.

John Newsome - Greater Orlando Aviation Authority, Chair of ACI-NA IT Committee

Question	Rationale
What has been the biggest challenge that you have faced in integrating your systems?	Validate our information and findings.
Have you created your own integration language or systems. If so what and how is this working out? Why did you create your own? What were the roles of vendors?	Find out what airports have done in integration.
When airports purchase a system that already has the functions of another system, why purchase the other system (e.g., purchasing a gate management system which already contains a maintenance function in that gate management system, why then purchase a maintenance system)?	Determine the value of overlapping systems.
If you were to give a small to medium airport advice, what would be the top five things?	Fill in gaps for small to medium airport integration.
What do you think of information technology standards? Are you aware of any?	Validate our findings.
If there were integration technology standards, how would these benefit the airports overall?	Validate our findings.
What manual process still exist in the airport? Where do you see redundant data collection? How would you address these areas?	Validate our findings on manual and redundant data collection.

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John D. Clark, III, A.A.E. Executive Director Jacksonville Aviation Authority

Question	Rationale
What are the areas of information that you need to make critical business decisions?	Validate the business critical information we have identified and fill in gaps.
What systems and sub-systems do you use to process data into business-critical information?	Validate systems and subsystems and how they work together.
Where are the key metrics that you use to measure how your airport is functioning: its efficiency, productivity, operations or financial health?	Validate that we have identified all the key metrics.
What are your top priorities for business-critical information?	Validate the business critical information and determine priorities of business critical information.
What deficiencies have you identified in the systems and procedures in place at your airport for collecting, processing, analyzing and reporting of your business critical information?	Validate and increase our knowledge of lessons learned.
Do you have a success story or best practice you would like to share in this regard? In the area of integration?	Validate and increase our knowledge of best practices. Determine state of the art in the industry.
Have you and/or your staff identified areas of redundant data collection or data entry or manual data collection which could be eliminated with an improvement in the integrability of systems?	Validate our identification of redundant and manual data collection.
What information would you want on a desktop "dashboard" to help you make quicker, more informed business decisions?	Validate priorities of business critical information and develop our handbook to ensure its ultimate usefulness.
When airports purchase a system that already has the functions of another system, why purchase the other system (e.g., purchasing a gate management system which already contains a maintenance function in that gate management system, why then purchase a maintenance system)?	Determine the value of overlapping systems?
What has been the biggest challenge that you have faced in integrating your systems?	Validate our information and findings.
Have you created your own integration language or systems. If so what and how is this working out? Why did you create your own? What were the roles of vendors?	Find out what airports have done in integration.
When airports purchase a system that already has the functions of another system, why purchase the other system (e.g., purchasing a gate management system which already contains a maintenance function in that gate management system, why then purchase a maintenance system)?	Determine the value of overlapping systems.
If you were to give a small to medium airport advice, what would be the top five things?	Fill in gaps for small to medium airport integration.
What do you think of information technology standards? Are you aware of any?	Validate our findings.
If there were integration technology standards, how would these benefit the airports overall?	Validate our findings.
What manual process still exist in the airport? Where do you see redundant data collection? How would you address these areas?	Validate our findings on manual and redundant data collection.

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Stacy Hollowell – Siemens - Airfield Solutions

Question	Rationale
You offer an IT package for small to medium-sized airports that includes a basic version of an AODB with interfaces to SITA and airlines. Airlines are known for their legacy systems. Have you successfully integrated day-of-operation flight information from major US airlines such as AA, UA, DL, CO or NW into your AODB?	Determine whether an airport can expect to integrate major airline real time operating information into Siemens' AODB.
There is a Task Force for Industry XML data integration standards underway. Have you worked with airports that have successfully used XML to extract data from your systems?	Determine whether XML will extract data from Siemens systems.
Have you successfully integrated your Surface Movement Guidance and Control System (SMGCS) with a major US airport's automated gate management system?	Determine whether SMGCS will work with a gate management system at a busy airport.
What data elements can be handed off from your Surface Movement Guidance and Control System (SMGCS) to an airport's Financial Management Systems?	Determine whether the SMGCS can track all airline arrival and departure information and hand it off for billing landing fees.

William L. Flowers - V.P. Information Technology Services Dallas – Ft. Worth International Airport, Member of ACI Information Technology Committee

Question	Rationale
You show four predominate systems in your PowerPoint presentation (Human Capital Management [HCM] diagram, financial diagram, budget and forecasting diagram, asset management diagram). Are all of them integrated within themselves and also integrated within each other? If yes, did you write your own import/export or integration technology language to move the data or solutions in and out of the systems or did they automatically integrate with each other? What standards did you use? Did you create standards yourself (as DIA has done)?	We want to find out how the systems are integrated and what technologies are used. It is beneficial to other airports to share information, especially about standardization and integration processes.
The PowerPoint refers to a Dallas Dashboard. What is this dashboard? How did you develop it?	Determine if the dashboard is what we may do in the handbook. If so, we can use this as an example. If not, we have an indication that others use the term dashboard differently than we do.
Have you been directed, as the VP of information technology services to deliver business-critical information to a manager's dashboard? If so, what would be the top five items most important to the senior management at Dallas International Airport?	Validates our priorities for the business critical information without forcing Mr. Flowers to read through the voluminous amount of materials we have gathered.
Based on your experience with these very expensive enterprise systems, what would your recommendation be for small medium airports—what advice would you give to integrate systems?	Help us learn what the benefits are through the perspective of a larger airport—and gain the benefit of his experience at a larger airport and the amount of integration Dallas has done.
You indicate that there is budget and forecasting in your document. In other studies, we noticed that Dallas is trying to accomplish real-time budgeting. What is the status of this? How are you doing this?	Real time budgeting is vital to airports. Airports currently update their budget maybe once a year, but a continuously updated budget would allow for real time adjustments. The budget then becomes a living document, reconciling to real time.
We found that there passenger fees are self reported by airlines. Have you found a way to collect this by yourselves in real time?	This is a manual process at most airports, and we are looking for best practices.

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Question	Rationale
Do you get flight schedules in advance? Do you match your budgets to these advance schedules? If so, where do you get these and how far in advance do you get this information?	We want to know which is manual data and which is automated. We are looking for solutions to self-reporting, manual processes for passenger fee <u>calculations</u> .
Do you have a direct data feed to the FAA? If so how do you use this and integrate this into your systems.	
What has been the biggest challenge that you have faced in integrating your systems?	Validate our information and findings.
Have you created your own integration language or systems. If so what and how is this working out? Why did you create your own? What were the roles of vendors?	Find out what airports have done in integration.
When airports purchase a system that already has the functions of another system, why purchase the other system (e.g., purchasing a gate management system which already contains a maintenance function in that gate management system, why then purchase a maintenance system)?	Determine the value of overlapping systems.
If you were to give a small to medium airport advice, what would be the top five things?	Fill in gaps for small to medium airport integration.
What do you think of information technology standards? Are you aware of any?	Validate our findings.
If there were integration technology standards, how would these benefit the airports overall?	Validate our findings.
What manual process still exist in the airport? Where do you see redundant data collection? How would you address these areas?	Validate our findings on manual and redundant data collection.

Jeff Hamiel - Executive Director, Metropolitan Airports Commission, Minneapolis – St. Paul Metropolitan Airports Commission

Question	Rationale
What are the areas of information that you need to make critical business decisions?	Validate the business critical information we have identified and fill in gaps.
What systems and sub-systems do you use to process data into business-critical information?	Validate systems and subsystems and how they work together.
Where are the key metrics that you use to measure how your airport is functioning: its efficiency, productivity, operations or financial health?	Validate that we have identified all the key metrics.
What are your top priorities for business-critical information?	Validate the business critical information and determine priorities of business critical information.
What deficiencies have you identified in the systems and procedures in place at your airport for collecting, processing, analyzing and reporting of your business critical information?	Validate and increase our knowledge of lessons learned.
Do you have a success story or best practice you would like to share in this regard? In the area of integration?	Validate and increase our knowledge of best practices. Determine state of the art in the industry.
Have you and/or your staff identified areas of redundant data collection or data entry or manual data collection which could be eliminated with an improvement in the integrability of systems?	Validate our identification of redundant and manual data collection.
What information would you want on a desktop “dashboard” to help you make quicker, more informed business decisions?	Validate priorities of business critical information and develop our handbook to ensure its ultimate usefulness.

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Hardy Acree - Director of Airports, Sacramento County Airport System

Question	Rationale
What are the areas of information that you need to make critical business decisions?	Validate the business critical information we have identified and fill in gaps.
What systems and sub-systems do you use to process data into business-critical information?	Validate systems and subsystems and how they work together.
Where are the key metrics that you use to measure how your airport is functioning: its efficiency, productivity, operations or financial health?	Validate that we have identified all the key metrics.
What are your top priorities for business-critical information?	Validate the business critical information and determine priorities of business critical information.
What deficiencies have you identified in the systems and procedures in place at your airport for collecting, processing, analyzing and reporting of your business critical information?	Validate and increase our knowledge of lessons learned.
Do you have a success story or best practice you would like to share in this regard? In the area of integration?	Validate and increase our knowledge of best practices. Determine state of the art in the industry.
Have you and/or your staff identified areas of redundant data collection or data entry or manual data collection which could be eliminated with an improvement in the integrability of systems?	Validate our identification of redundant and manual data collection.
What information would you want on a desktop "dashboard" to help you make quicker, more informed business decisions?	Validate priorities of business critical information and develop our handbook to ensure its ultimate usefulness.
What has been the biggest challenge that you have faced in integrating your systems?	Validate our information and findings.
Have you created your own integration language or systems. If so what and how is this working out? Why did you create your own? What were the roles of vendors?	Find out what airports have done in integration.
When airports purchase a system that already has the functions of another system, why purchase the other system (e.g., purchasing a gate management system which already contains a maintenance function in that gate management system, why then purchase a maintenance system)?	Determine the value of overlapping systems.
If you were to give a small to medium airport advice, what would be the top five things?	Fill in gaps for small to medium airport integration.
What do you think of information technology standards? Are you aware of any?	Validate our findings.
If there were integration technology standards, how would these benefit the airports overall?	Validate our findings.
What manual process still exist in the airport? Where do you see redundant data collection? How would you address these areas?	Validate our findings on manual and redundant data collection.

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Tom Dominico - Director IT – Logan International Airport

Question	Rationale
What has been the biggest challenge that you have faced in integrating your systems?	Validate our information and findings.
Have you created your own integration language or systems. If so what and how is this working out? Why did you create your own? What were the roles of vendors?	Find out what airports have done in integration.
When airports purchase a system that already has the functions of another system, why purchase the other system (e.g., purchasing a gate management system which already contains a maintenance function in that gate management system, why then purchase a maintenance system)?	Determine the value of overlapping systems.
If you were to give a small to medium airport advice, what would be the top five things?	Fill in gaps for small to medium airport integration.
What do you think of information technology standards? Are you aware of any?	Validate our findings.
If there were integration technology standards, how would these benefit the airports overall?	Validate our findings.
What manual process still exist in the airport? Where do you see redundant data collection? How would you address these areas?	Validate our findings on manual and redundant data collection.

Thella F. Bowens - CEO and President – San Diego International Airport

Question	Rationale
What are the areas of information that you need to make critical business decisions?	Validate the business critical information we have identified and fill in gaps.
What systems and sub-systems do you use to process data into business-critical information?	Validate systems and subsystems and how they work together.
Where are the key metrics that you use to measure how your airport is functioning: its efficiency, productivity, operations or financial health?	Validate that we have identified all the key metrics.
What are your top priorities for business-critical information?	Validate the business critical information and determine priorities of business critical information.
What deficiencies have you identified in the systems and procedures in place at your airport for collecting, processing, analyzing and reporting of your business critical information?	Validate and increase our knowledge of lessons learned.
Do you have a success story or best practice you would like to share in this regard? In the area of integration?	Validate and increase our knowledge of best practices. Determine state of the art in the industry.
Have you and/or your staff identified areas of redundant data collection or data entry or manual data collection which could be eliminated with an improvement in the integrability of systems?	Validate our identification of redundant and manual data collection.
What information would you want on a desktop “dashboard” to help you make quicker, more informed business decisions?	Validate priorities of business critical information and develop our handbook to ensure its ultimate usefulness.

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National Flight Data Center

Question	Rationale
What are the basic data that you share?	Validate source of information
What format do you share information in?	Validate standards for transmitting data
What standards of information sharing do you practice and have you promoted?	Validate integration strategies.
What do you see as the future for using your data? For providing real time flight information?	Help develop the vision for the handbook.
What successes have you had in sharing this information?	Determine lessons learned and effectiveness of data sharing.
Why did you develop this information? What was the triggering need for this information?	Determine benefits of data sharing.
How do you envision people using this information?	Determine uses of information.

Duane Habeck – President – Airport Integrated Systems

Question	Rationale
Your methodology incorporates data relating to 300 airport business processes. What are these processes? Are these integrated processes? What has your assessment been? Have you found any gaps in business processes. Overall, how have these been integrated?	Validate our findings on business processes.
What business and operational activity delivers business critical information to an airport?	Validate our findings on business critical information.
Other industries have been working on standards of communication between types of systems, otherwise known as an Application Programming Interfaces API. Are there aviation standards data standards for communicating data between software systems in an airport? If so, do you use any of these standards? What technology do you use (e.g., XML)?	Determine what standards there are and what is being used for integration technology.
Do you use any particular strategies to integrate?	Validate our findings on integration strategies.

Jeffrey Shull - Vice President of Airport Solutions – Air Transport IT Services

Question	Rationale
What business and operational activity delivers business critical information to an airport?	Validate our findings on business critical information.
Other industries have been working on standards of communication between types of systems, otherwise known as an Application Programming Interfaces API. Are there aviation standards data standards for communicating data between software systems in an airport? If so, do you use any of these standards? What technology do you use (e.g., XML)?	Determine what standards there are and what is being used for integration technology.
Do you use any particular strategies to integrate?	Validate our findings on integration strategies.
The AODB indicates that it works "best" with "our own modules but has been designed for expansion and integration into the airports existing system architecture"	Determine scalability of systems and how open the open architecture is. Determine the strategies used for operational databases.
Can you explain how? What technology and strategies are you using for integration into other systems?	
We notice that you also connect to external applications such as SITA, CUTE or EDIFACT. How do you do this? Are you using an XML technology to do so?	Determine integration methods and strategies of the airport operational database.

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Question	Rationale
<p>What technologies are you using to pull the data out of the airline legacy systems and into your systems? What is the benefit of this to an airport (e.g., feed flight information display, get financial information)?</p> <p>Third party legacy Systems include:</p> <ul style="list-style-type: none"> ➤ Airline Systems ➤ Handling agents ➤ Administration ➤ Building Mgmt. ➤ ERP ➤ Security, etc. 	<p>Identify integration technology for legacy systems.</p>
<p>On the diagram "AODB AirlT" you show a "middleware software." Do you provide this or is it provided by an outside vendor? Why do you use a middleware software?</p>	<p>Determine if there are third parties involved in integration with an airport operational database. (Is there always going to be a middleware?)</p>
<p>Where have you seen redundant data collection and manual data collection and how does your system solve this?</p>	<p>Validate our findings on manual and redundant data.</p>

Terry McNicholas – Executive Vice President – InfoTrust

Question	Rationale
<p>What business and operational activity delivers business critical information to an airport?</p>	<p>Validate our findings on business critical information.</p>
<p>Other industries have been working on standards of communication between types of systems, otherwise known as an Application Programming Interfaces API. Are there aviation standards data standards for communicating data between software systems in an airport? If so, do you use any of these standards? What technology do you use (e.g., XML)?</p>	<p>Determine what standards there are and what is being used for integration technology.</p>
<p>Do you use any particular strategies to integrate?</p>	<p>Validate our findings on integration strategies.</p>
<p>Can you explain how? What technology and strategies are you using for integration into other systems?</p>	<p>Determine scalability of systems and how open the open architecture is. Determine the strategies used for operational databases.</p>
<p>Have you seen standards for integration technology and strategies in the airline industry that could benefit the airport industry?</p>	<p>Determine if there are gaps in our findings.</p>

Randall H. Walker – Director of Aviation - Clark County Department of Aviation

Question	Rationale
<p>What are the areas of information that you need to make critical business decisions?</p>	<p>Validate the business critical information we have identified and fill in gaps.</p>
<p>What systems and sub-systems do you use to process data into business-critical information?</p>	<p>Validate systems and subsystems and how they work together.</p>
<p>Where are the key metrics that you use to measure how your airport is functioning: its efficiency, productivity, operations or financial health?</p>	<p>Validate that we have identified all the key metrics.</p>
<p>What are your top priorities for business-critical information?</p>	<p>Validate the business critical information and determine priorities of business critical information.</p>
<p>What deficiencies have you identified in the systems and procedures in place at your airport for collecting, processing, analyzing and reporting of your business critical information?</p>	<p>Validate and increase our knowledge of lessons learned.</p>

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Question	Rationale
Do you have a success story or best practice you would like to share in this regard? In the area of integration?	Validate and increase our knowledge of best practices. Determine state of the art in the industry.
Have you and/or your staff identified areas of redundant data collection or data entry or manual data collection which could be eliminated with an improvement in the Integrability of systems?	Validate our identification of redundant and manual data collection.
What information would you want on a desktop “dashboard” to help you make quicker, more informed business decisions?	Validate priorities of business critical information and develop our handbook to ensure its ultimate usefulness.

Samuel G. Ingalls - Assistant Director, Information Systems – Clark County Department of Aviation - Member of ACI Information Technology Committee

Question	Rationale
In the interview (Joachim 2003) you said you had a direct feed from the FAA into the airlines’ flight system. This indicates that some of the flight monitor display information may be controlled through the FAA data feed. Are you still using this data feed, and what information do you get from that (e.g., flight, tail) and what format do you get it in (e.g. XML)	Validate how and when other airports can benefit from this information. Use the experience of a larger airport to determine the benefits and how to get this information for small to medium airports.
Aside from arrival and departure time from originating city, what information do you glean from the direct data feed from FAA?	Validate sources of information.
Does your gate management system feed into your rates and charges or lease management system and into your cost accounting system to bill your customers?	Determine if McCarran has accomplished a true integration.
McCarran has a direct socket from Southwest United from their flight schedules to download flight schedules into a common use flight information display system and a common use gate management system. How did the data transfer? (e.g., Did you write an interface program? Did you write an ODBC system? Are you using an XML standard? Did the software company write it?) How difficult was this integration?	Determine if other airports can use the same techniques. Determine if a small, medium, or large airport could accomplish the same thing with other airlines or if it would be too arduous.
Why did you buy Passur?	Determine the advantages of buying a system over using the FAA information which is free.
Your gate management system has a maintenance feature and Maximo has a maintenance function. Are you using both? If so, how do they work together and if not, why did you purchase both? If you could have purchased a scaled back gate management system without these maintenance functions, would you have done so?	Determine why airports buy systems that have dual functionality and why they abandon parts of some of the original solution (e.g. too much complexity or not enough functionality). Show small to medium airports that buying a system with a minimal amount of functionality may be preferable to buying systems with dual functionality.
McCarran is the forerunner for setting the standard for CUPPS (including wiring and infrastructure at an airport). What prompted you to do this? What pain did you experience that sent you in this direction for standardization? How did you rally champions for this standard.	Determine rationales and methods of getting champions for new standards.
If you could list the five most important lessons learned from the technology side of implementation, what would they be?	Determine the most important practices for integration.
With all of this integration, did you consider the top five business critical information pieces that Randall Walker would want on his desk every morning.	Determine whether integration processes consider business critical information.

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Question	Rationale
What other ideas for standards and integrating software do you have? (e.g., medical industry has common use language to transfer data from system to system that is recognized worldwide—would you see a benefit to this in the airport industry? If so, what would those benefits be?	Determine the future needs for standards and what current or future actions will be taken for standardization.
Who should we interview at IATA who could provide insights into the state of integration and standards?	Determine if there is someone at IATA who it would be worthwhile to interview.
What has been the biggest challenge that you have faced in integrating your systems?	Validate our information and findings.
Have you created your own integration language or systems. If so what and how is this working out? Why did you create your own? What were the roles of vendors?	Find out what airports have done in integration.
When airports purchase a system that already has the functions of another system, why purchase the other system (e.g., purchasing a gate management system which already contains a maintenance function in that gate management system, why then purchase a maintenance system)?	Determine the value of overlapping systems.
If you were to give a small to medium airport advice, what would be the top five things?	Fill in gaps for small to medium airport integration.
What do you think of information technology standards? Are you aware of any?	Validate our findings.
If there were integration technology standards, how would these benefit the airports overall?	Validate our findings.
What manual process still exist in the airport? Where do you see redundant data collection? How would you address these areas?	Validate our findings on manual and redundant data collection.

Dave Ruch - Director of Information Systems Minneapolis – St. Paul Metropolitan Airports Commission

Question	Rationale
In 2000, Northwest hired Airtransport IT services to bring in an integrated airport system, including a gate management system and a FIDS system. What is the status of this? The first phase consisted of an airport operational data base, a flight scheduling system, and public FIDS system. A gate management system was added. What happened? For example, what happened to equipment and inventory processing?	Determine if a tenant based airport without a lot of common use facilities changes to a common use airport, This will provide insights on how to handle transitions to common use for smaller and medium sized airports.
What are your primary systems and subsystems that you use to process data?	Validate our systems and subsystems findings.
Based on your experience with a major carrier bankruptcy, would you structure your IT differently?	Validate our lessons learned.
What has been the biggest challenge that you have faced in integrating your systems?	Validate our information and findings.
Have you created your own integration language or systems. If so what and how is this working out? Why did you create your own? What were the roles of vendors?	Find out what airports have done in integration.
When airports purchase a system that already has the functions of another system, why purchase the other system (e.g., purchasing a gate management system which already contains a maintenance function in that gate management system, why then purchase a maintenance system)?	Determine the value of overlapping systems.
If you were to give a small to medium airport advice, what would be the top five things?	Fill in gaps for small to medium airport integration.

Appendix D

Question	Rationale
What do you think of information technology standards? Are you aware of any?	Validate our findings.
If there were integration technology standards, how would these benefit the airports overall?	Validate our findings.
What manual process still exist in the airport? Where do you see redundant data collection? How would you address these areas?	Validate our findings on manual and redundant data collection.

Alan Burgess - SITA

Question	Rationale
Your methodology incorporates data relating to 300 airport business processes. What are these processes? Are these integrated processes? What has your assessment been? Have you found any gaps in business processes. Overall, how have these been integrated?	Validate our findings on business processes.
What business and operational activity delivers business critical information to an airport?	Validate our findings on business critical information.
Other industries have been working on standards of communication between types of systems, otherwise known as an Application Programming Interfaces API. Are there aviation data standards for communicating data between software systems in an airport? If so, do you use any of these standards? What technology do you use (e.g., XML)?	Determine what standards there are and what is being used for integration technology.
Do you use any particular strategies to integrate?	Validate our findings on integration strategies.
The AODB indicates that it works "best" with its "our own modules but has been designed for expansion and integration into the airports existing system architecture. Can you explain how? What technology and strategies are you using for integration into other systems?	Determine scalability of systems and how open the open architecture is. Determine the strategies used for operational databases.
SITA is working on the Task Force for Industry XML data integration standards. How will airports benefit from these industry standards?	Determine benefits of integration.
What changes should airports expect as a result of the introduction of these standards?	Determine lessons learned and effectiveness of standards.
Other industries have been working on standards of communication between types of systems otherwise known as Application Programming Interfaces (APIs). Are there aviation standards for communicating data between software systems at an airport.	Determine if there are any gaps in our data collection to date?
Are there any standardized naming conventions for airports similar to airlines. (e.g., airports use and call a fee for passenger getting on the airplane many different things such as a passenger fee or an enplaning fee or public use fee?) For example, IATA has a ground handling manual that sets an industry benchmark, recognized worldwide, for information processes and flows (for example to ensure equipment names are consistent and that ground handling of an airplane follows consistent procedures). MAGSA has something similar for aviation service providers (vendors). Do you know of anything similar to this for an airport, aside from what IATA has already published?	Determine if there are any gaps in our data collection to date.

Appendix D

Question	Rationale
Is there any document that you know of that details the key data elements are for the functional areas of an airport and the business critical information that a manager would want to know? If so, can you point us in that direction?	Additional validation of the key data elements and business critical information we have developed.
In your experience, based on how involved the ACI is in integration standards, what are the pros and cons of integration for small to medium airports? What are the benefits and negative aspects?	We did not find anything on integration on pros and cons to small and medium airports and this would help us validate.
<p>How would SITA and ARINC benefit from an "airport XML standard"? Throughout the typex-white_paper, the XML schema specifications are mentioned, would these be considered mostly for "airline legacy systems".</p> <p>The quote denoted below indicates the open protocol would immediately benefit the newer applications, why? How does this apply to an airports architectural infrastructure?</p> <p>"The Air Transport Industry (ATI) will reap several specific benefits of the new technology as it is adopted over time as a future replacement for Type B messaging. Key benefits will most immediately accrue to new applications, and then to eventually to legacy applications as they migrate to newer platforms. "</p>	Determine vendor benefits to developing XML standards when they have their own standards?
What is the difference between this "new XML standard" and the other standards already published by ISO and OASIS? Why reinvent the wheel? Is this open standard better than the others or just built more on an aviation standard?	Determine the differences between industries and the standards that they set.

Louis Miller - Executive Director, CEO – Tampa International Airport

Question	Rationale
What are the areas of information that you need to make critical business decisions?	Validate the business critical information we have identified and fill in gaps.
What systems and sub-systems do you use to process data into business-critical information?	Validate systems and subsystems and how they work together.
Where are the key metrics that you use to measure how your airport is functioning: its efficiency, productivity, operations or financial health?	Validate that we have identified all the key metrics.
What are your top priorities for business-critical information?	Validate the business critical information and determine priorities of business critical information.
What deficiencies have you identified in the systems and procedures in place at your airport for collecting, processing, analyzing and reporting of your business critical information?	Validate and increase our knowledge of lessons learned.
Do you have a success story or best practice you would like to share in this regard? In the area of integration?	Validate and increase our knowledge of best practices. Determine state of the art in the industry.
Have you and/or your staff identified areas of redundant data collection or data entry or manual data collection which could be eliminated with an improvement in the integrability of systems?	Validate our identification of redundant and manual data collection.
What information would you want on a desktop "dashboard" to help you make quicker, more informed business decisions?	Validate priorities of business critical information and develop our handbook to ensure its ultimate usefulness.

Appendix D

Question	Rationale
When airports purchase a system that already has the functions of another system, why purchase the other system (e.g., purchasing a gate management system which already contains a maintenance function in that gate management system, why then purchase a maintenance system)?	Determine the value of overlapping systems?
What has been the biggest challenge that you have faced in integrating your systems?	Validate our information and findings.
Have you created your own integration language or systems. If so what and how is this working out? Why did you create your own? What were the roles of vendors?	Find out what airports have done in integration.
When airports purchase a system that already has the functions of another system, why purchase the other system (e.g., purchasing a gate management system which already contains a maintenance function in that gate management system, why then purchase a maintenance system)?	Determine the value of overlapping systems.
If you were to give a small to medium airport advice, what would be the top five things?	Fill in gaps for small to medium airport integration.
What do you think of information technology standards? Are you aware of any?	Validate our findings.
If there were integration technology standards, how would these benefit the airports overall?	Validate our findings.
What manual process still exist in the airport? Where do you see redundant data collection? How would you address these areas?	Validate our findings on manual and redundant data collection.

Robert Kastelitz- Director of IT and Jim Miller, Manager of IT – Denver International Airport – Joint Interview

Question	Rationale
What has been the biggest challenge that you have faced in integrating your systems?	Validate our information and findings.
You have created your own integration language in XML for your flight management system. How have you revamped your flight management system? Why did you create your own language for this integration? What was the role of vendors in this process? Which systems and subsystems are involved in that integration?	Find out what airports have done in integration.
When airports purchase a system that already has the functions of another system, why purchase the other system (e.g., purchasing a gate management system which already contains a maintenance function in that gate management system, why then purchase a maintenance system)?	Determine the value of overlapping systems.
If you were to give a small to medium airport advice, what would be the top five things?	Fill in gaps for small to medium airport integration.
What do you think of information technology standards? Are you aware of any?	Validate our findings.
If there were integration technology standards, how would these benefit the airports overall?	Validate our findings.
What is the status of your document management system? Is it fully integrated? Does it assist in some of the manual processes? What are these manual processes?	Validate our findings on manual processes.

Appendix D

Question	Rationale
What manual process still exist in the airport? Where do you see redundant data collection? How would you address these areas?	Validate our findings on manual and redundant data collection.
What efforts have you made to make the operations log accessible to senior management on their desktop?	Validate state of the industry and lessons learned.
What lessons did you learn from your project to integrate your work order, inventory control, and finance systems?	Validate findings on lessons learned.
What improvements have you seen from your efforts to integrate? Have they been effective for your airport?	Determine effectiveness of integration efforts.

Jeffrey Fagen - CEO – Dallas Fort Worth International Airport

Question	Rationale
What are the top 5 business critical information pieces that you want to see on your “Dallas Dashboard”	Validates our priorities for the business critical information without forcing Mr. Fagen to read through the voluminous amount of materials we have gathered.
Why are you doing all of this integration? What was the pain threshold that led you to this integration? What were the five “pain levels” or problems that led you to invest in integrating?	Determine rationales for integrating.
Did you change business practices when implementing this integration? If so, what and how were these identified?	Determine overall impact of integration.
Did you involve your stakeholders? If so, how?	Determine best practices for developing champions for implementing integration.
What successes have you had and what are the challenges ahead?	Determine lessons learned, pitfalls, and best practices for integration.
What are the areas of information that you need to make critical business decisions?	Validate the business critical information we have identified and fill in gaps.
What systems and sub-systems do you use to process data into business-critical information?	Validate systems and subsystems and how they work together.
Where are the key metrics that you use to measure how your airport is functioning: its efficiency, productivity, operations or financial health?	Validate that we have identified all the key metrics.
What are your top priorities for business-critical information?	Validate the business critical information and determine priorities of business critical information.
What deficiencies have you identified in the systems and procedures in place at your airport for collecting, processing, analyzing and reporting of your business critical information?	Validate and increase our knowledge of lessons learned.
Do you have a success story or best practice you would like to share in this regard? In the area of integration?	Validate and increase our knowledge of best practices. Determine state of the art in the industry.
Have you and/or your staff identified areas of redundant data collection or data entry or manual data collection which could be eliminated with an improvement in the integrability of systems?	Validate our identification of redundant and manual data collection.
What information would you want on a desktop “dashboard” to help you make quicker, more informed business decisions?	Validate priorities of business critical information and develop our handbook to ensure its ultimate usefulness.