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# **IMPLEMENTING INTEGRATED SELF-SERVICE AT AIRPORTS**

## **FINAL REPORT**

Prepared for  
ACRP  
Transportation Research Board  
of  
The National Academies

Barich, Inc.  
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# OVERVIEW & REPORT ORGANIZATION

In response to the Airport Cooperative Research Program (ACRP) Project 10-17, initiated by the Transportation Research Board (TRB), the Barich Inc. Research Team (Team) has developed a Guidebook on Implementing Integrated Self-Service at Airports, which was submitted separately from this Final Report (Report). In accordance with the project's Amplified Working Plan, the project objective is to develop guidelines for considering, evaluating, and making strategic decisions for implementing and optimizing a comprehensive passenger self-service experience for a variety of sizes of U.S. airports and their stakeholders. To meet these objectives our guidebook addresses the research problem statement paying close attention to the following items and issues:

- An inventory of self-service applications and technologies with their respective benefits
- Establishment of a decision-making roadmap to implement self-service
- Identification of associated infrastructure and airport/airline/other stakeholder integration requirements of multiple self-service applications (e.g., physical space, technology)
- Guidance for developing business cases for various stakeholders distinguishing differences between Common use and proprietary requirements
- Determination of operational requirements to include staffing and maintenance
- Consideration of regulatory requirements and industry standards
- Identification of potential integrations of other non-passenger self-service applications to facilitate employee and tenant services, such as
- Demonstration of how various stakeholder technologies can combine into one cohesive system
- Glossary of Terms

All concerns and recommendations obtained from the panel members following the Team's presentation of the Interim Report to and its subsequent discussion with the panel have been incorporated into this Report and the Guidebook, where applicable.

# RESEARCH METHODOLOGY & RESULTS

This section presents the summary of the research methodology, including the data collection approach and the data analysis approach, as well as the research results focusing primarily on the case study effort.

## Data Collection Approach

The data collection effort during Tasks 1 and 2 has been completed. The data collection approach focused on the following components:

- Published Literature
  - ACRP Reports
  - Industry Associations
  - Vendors
  - Industry News
- Interviews (on-site visits and telephone/web-based conference meetings):
  - Airports
  - Airlines
- Conferences / Webinars

Case study research, the next phase of the data collection effort and Task 3 of the Project, is discussed in detail in its own section later in this Report.

## Published Literature

Published literature research efforts were focused on airports' and airlines' experiences and latest self-service programs and initiatives, industry associations' publications and guidelines, vendors' and technology providers' expertise and latest offerings, and overall industry trends and outlook into the future of self-service from aviation, travel, and technology perspectives. For published literature, the Team's data collection approach and related objectives included:

- Performing a comprehensive initial document search (primarily Internet-based) that yielded various types of documents for the purpose of building a broad and solid research foundation to cover various subject areas as well as identifying those areas that fell short of providing sufficient results.
- Acquiring additional source material via periodic, specifically targeted searches, to fill the information gaps in those previously identified areas that lacked information.
- Strengthening the value of the collected information as a whole to establish a more solid foundation of the existing body of knowledge in the area of study.

It should be noted that the research of published literature constitutes an ongoing process throughout the course of the Project as new and relevant information becomes available. Valuable information is continually incorporated into upcoming Project deliverables, especially the final Guidebook.

## Interviews

The data collection effort during Task 2 also included telephone/web-based interviews with airports and airlines as well as onsite visits at strategically selected domestic and overseas airport locations. Interview Discussion Guides, as shown in Appendix A and B were developed considering the Project's objectives and current body of knowledge.

Interviews and research obtained excellent examples of success with the passenger journey points from pre-travel to passenger arrival, however, the preliminary research was not as strong at the airport arrival points - most airports and airlines focus on the departure side.

The interview outreach efforts, which resulted in some rejections of participation, led to the following completed Interviews to date:

- Airports
  - Denver International
  - London Heathrow
  - Las Vegas McCarran International
  - Miami International
  - Munich
  - Montreal-Trudeau
  - Orlando International
  - Seattle-Tacoma International
- Airlines
  - Iberia Airlines
  - Lufthansa
  - United Airlines
  - WestJet

The interviews completed at this point primarily served the purpose of information discovery and identification of potential case study locations/subjects. Detailed interview notes for the Airports are provided in Appendices C1-8. Due to confidentiality concerns, the interview notes for the airlines are presented in form of a collective summary, as shown in Appendix C9, highlighting note-worthy key insights. The Team selected airports and airlines, based on Team member experience that provided a good representation of self-service initiatives across all points of the passenger journey. The completed interviews also helped to address the Project objectives and gaps identified during the literature reviews. A more complete addressing of objectives and gaps will be conducted through the case studies and any other follow on interviews. Any outstanding interviews depend on the availability and willingness of the already contacted interview subjects.

Due to challenges in coordinating schedules the Team did not achieve the desired amount of airline specific interviews. However, the Team will make a conscious effort to integrate airline interview during the case study phase by reaching out to and including the primary airline stakeholder of each selected case study airport.

## Conferences/Webinars

The data collection approach during Tasks 1 and 2 also included attendance at and participation in related conferences and webinars, including the following:

- 1) “ACI-NA Annual Conference & Exhibition 2013,” *Airport Council International – North America*, September 22-25, San Jose, CA.
  - Collected information related to passenger self-service initiatives at over 15 North American Airports.
  - Met with vendors providing self-service solutions
  - Coordinated follow on discussions with key airport members
- 2) “FTE Global Conference & Exhibition 2013,” *Future Travel Experience*, September, 2-4, Las Vegas, NV.
  - Attended presentations regarding current and future passenger travel initiatives, primarily focused on self-service.
  - Met with vendors providing self-service solutions
- 3) “Create Applications that Inspire the Way the World Travels” – *Tnooz & Sabre Travel Network*, Webinar, October 16, 2013.
  - Gained insight into the latest trends in mobile applications
  - Gathered additional information on passenger travel habits
- 4) “Passenger IT Trends Survey 2013” – *SITA & Air Transport World*, Webinar. October 17, 2013.
  - Gained additional insight into this subject from expert interpretations and implications of the results of this annual survey.

Others are planned to be attended as the Project progresses. These events enabled outreach to multiple airport, airline, vendors, and industry association representatives for voluntary participation in the Project and as contacts for interviews and case study efforts.

In summary, Table 1 highlights the data collection methodology components and each component’s objectives for the preparation of the final Guidebook.

<b>Data Collection Components</b>	<b>Purpose / Objectives</b>
Published Literature	<ul style="list-style-type: none"> <li>• To build a very broad, general, and solid foundation of existing knowledge</li> <li>• To identify knowledge gaps that need to be addressed to fulfill overall Project objectives</li> </ul>
Interviews	<ul style="list-style-type: none"> <li>• To discover industry trends</li> <li>• To provide additional information for addressing Project objectives</li> <li>• To identify new and previous gaps that need to be addressed to fulfill overall and specific Project objectives</li> <li>• To help identify case study locations</li> </ul>
Conferences / Webinars	<ul style="list-style-type: none"> <li>• To reach out to potential point of contacts to create interest in the Project and voluntary participation</li> <li>• To ensure latest trends have been incorporated into the ongoing research process</li> </ul>

<b>Data Collection Components</b>	<b>Purpose / Objectives</b>
Case Studies (next phase)	<ul style="list-style-type: none"> <li>• To address research gaps</li> <li>• To gather all information necessary to fulfill required research objectives to produce final Guidebook</li> </ul>

Table 1. Purpose of Data Collection Methodology Components.

## Data Analysis Approach

During Tasks 1 and 2 of the Project, as discussed above, the Team analyzed all data collected by evaluating the information received from answers to the interview discussion points. If information within a specific category was found to be insufficient, the Team identified it as a ‘gap’ for further evaluation during the case study phase (Task 3).

For example, Table 2 presents a summary of the answers to the question inquiring about the extent of the integration with other self-service (passenger and non-passenger) applications and processes in regard to existing self-service initiatives currently in place. Based on the analysis of the gathered data, the Team identified that integration of existing services is a challenge for many airports. Some of the airports interviewed did not provide any information due to not having “looked much into the matter yet.” Some of those airports that have addressed the issue seem to have more questions than answers. Others identified integrations in a more general, obvious manner, for example, “Remote Bag Collection integrates with Baggage processing.” And a couple of others have more specific plans, as they have put more effort into understanding integration aspects.

<b>Question</b>	<b>Summary Response Statement</b>
Extent of integration with other self-service (passenger and non-passenger) applications and processes	<ul style="list-style-type: none"> <li>• Concerned about the integration and is leaning toward keeping things separate on purpose</li> <li>• Standard design for SS-kiosks the airport deploys? Might depend on type of kiosk and its purpose. The look of it should not confuse passenger. Different look for different types of kiosks.</li> <li>• Can a mobile App be used for operational purposes as well as passenger services?</li> <li>• Debit card dispensing kiosks?</li> <li>• No integration expected for CBP kiosks. IT infrastructure is dedicated to this process</li> <li>• Common Use Self-Service Check-in with CU Self-tagging</li> <li>• Remote Bag Collection integrates with Baggage processing</li> <li>• Passenger Self-Boarding should be investigated further with the airlines.</li> <li>• Location-based services integrate with the wireless network, Smart phones, and websites.</li> <li>• Website integrates with social media channels</li> <li>• We are looking at using our CUSS kiosks as multi-use kiosks to include “while you are here” information, such as on art museums, sites, cultural information. This would be a limited deployment at carefully selected locations; strategically placed according to arriving passengers. There is awareness of the risks of making a CU kiosk a multi-function kiosk.</li> <li>• Website, mobile app, and the “while you are here” concept as part of the ConnectID platform have to be integrated over time</li> <li>• Dynamic Signage and Common Use – we are moving more airlines around to accommodate airport requirements. Moving static signage is problematic and costly.</li> </ul>

Table 2. Summary Analysis of Self-Service Application Integration.

This area is a relevant subject not only as it directly relates to the Project’s primary objectives but also as it serves as enabling an airport to identify opportunities. Therefore, this area was identified as one of the primary focal points for the case study phase.

Table 3 provides a listing of the identified gaps, all of which become focal points for the remainder of the Project’s research efforts.

<b>Gap #</b>	<b>Description</b>
1	Understanding extent of integration with other self-services (passenger and non-passenger) applications and processes. Some airports, like Miami, are trialing efforts with integrated uses on self-service kiosks. Others spoke in general terms.
2	Coordination and collaboration with external stakeholders for integrated self-service strategies.
3	Preliminary research was not as strong at the airport arrival points - most airports and airlines focus on the departure points of the passenger’s journey. Many airports discussed the benefit of such team collaborations and have put in place formal processes.
4	Quantitative and qualitative benefits and costs. Interviews and information collection did not allow for the detail required to understand this area. This also includes means of establishing pricing models.
5	Impact to supporting policies and procedures.
6	Better understanding of the local community demographic and its impact to the specific airport decisions on self-service, as well as the demographics of arriving passengers, particularly the international set, as it will affect signage, mobile apps, security, etc. Demographic may include transfer passengers. Most airports discussed this issue in general terms. Detailed information will be needed during case study interviews.

*Table 3. Known Gaps resulting from Task 1 & 2 Research*

The Team further analyzed the data collected against the objectives of the final Guidebook, including:

- An inventory of self-service applications and technologies with their respective benefits, including both common use and proprietary solutions
- Establishment of a decision-making roadmap to implement self-service
- Identification of associated infrastructure and airport/airline/other stakeholder integration requirements of multiple self-service applications (e.g., physical space, technology)
- Guidance for developing business cases for various stakeholders
- Determination of operational requirements to include staffing and maintenance
- Consideration of regulatory requirements and industry standards
- Identification of potential integrations of other non-passenger self-service applications to facilitate employee and tenant services
- Demonstration of how various stakeholder technologies can combine into one cohesive system, including common use, proprietary, passenger-owned, and other 3rd party technologies

The case study research approach, as discussed in detail in its own section, was developed to ensure that gaps as well as objectives will be properly addressed.

## **Primary Research Results**

### **Passenger Journey**

For the purposes of this research, the Passenger Journey has been divided into two categories; the Passenger Decision Points and the Passenger Journey Points. The Passenger Decision Points describe the primary decision steps that the passenger must make throughout the travel experience. The Passenger

Journey Points describe the aviation processes and timeframes that the traveler moves through during the travel experience.

The Team developed the Passenger Decision Points by first thinking through the questions and parameters that travelers consider when planning a trip. Once this flow was established, items that are related through sequence and/or topic were combined and assigned an appropriately descriptive title to the group. It is believed that working backwards in this manner, as opposed to establishing the high level steps and then inserting the details, better ensures that all intermediate steps have been documented.

The Passenger Decision Points are listed below as high level steps with the considerations and questions that the passenger must address within each.

- Identify Trip Parameters
  - Destination
  - Accommodations and transport at arriving airport
  - Dates
  - Budget
  - Time of Departure
  - Time of Return
  - Level/Type of Amenities and Travel Experience desired (services, self-service)
  - Modes of Transportation
  - ADA needs
- Identify Modes of Transport
  - Plane
  - Ship
  - Vehicle (personal, rental, taxi, shuttle, other)
  - Train
- Consider Baggage Issues
  - Size & Weight of Baggage
  - Number of Bags
  - Baggage fees
  - Means to transport Bags
- Identify Airline & Airport(s)
  - Consider price
  - Consider frequent flier impacts (free flight, increase in status)
  - Consider layovers
  - Consider flight times
  - Consider delay history
  - Consider proximity to Origin and Destinations
  - Consider amenities
  - Consider modes of transportation to and from airports
- Draft Itinerary
  - Identify specific blocks of time (morning, afternoon, evening) of travel on specific dates
  - Finalize modes of transportation
  - Finalize means for transporting baggage (airplane, shipping separately)
- Establish Reservations

- Reserve transportation to airport (if applicable)
- Purchase flight, select seat(s) (use frequent flyer points as applicable) and provide additional information (frequent flyer number, peanut allergy notification, special needs, etc)
- Obtain Tickets
  - Tickets for transportation to and from airport(s)
  - Tickets for flight (paper, electronic, mobile)
- Organize Travel Itinerary & Information
  - Collect travel confirmations
  - Collect coupons for services
  - Develop schedule/itinerary
  - Collect applicable maps
  - Understand ancillary impacts (road and airport construction, international traveling delays, etc)
  - Collect information on sites visiting
  - Weather forecasts
  - Finalize parking location (garage, off-site)
  - Finalize where and when to eat (airport, prior to airport, after leaving airport)
- Start the Trip
  - Review weather
  - Monitor traffic conditions and assess route to airport
  - Make adjustments to address current conditions
  - Confirm possession of tickets for all modes of transportation
  - Confirm possession of coupons
  - Send Baggage separately (if applicable)
  - Depart for Airport
- Arrive at the Airport
  - Airport Destination (terminal, parking garage, off-site parking, curbside drop-off)
  - Where to check baggage?
  - Where to print ticket(s)?
  - Where to modify ticket(s)?
  - Which airport check-point to use?
  - When to get in check-point line?
  - Which screening line to use?
- Decide on Dwell Time before checkpoint and after checkpoint
  - Where is the flight's gate? Has it changed?
  - Where is a map of the airport?
  - Where is the closest restroom?
  - Is the flight on-time?
  - How much time is needed to get through checkpoint?
  - Shop at airport? Shop pre- or post checkpoint?
  - What options (shopping, power, WiFi, etc.) are available pre / post checkpoint?
  - WiFi needed? Pay or not (if applicable)?
  - Need to provide feedback to airport, airline, TSA, concessionaires, others?
- In-Flight
  - What to do in the event of a delayed flight?

- Where to go in the event of a cancelled flight?
- What is the process to board the flight
- Is there WiFi available before taking off?
- How to get to connecting flight information?
- Did baggage make it on the plane?
- Arrive at Airport Destination
  - If connecting, where is the connecting flight and is it on time? (if connecting, all the in-flight questions then apply again)
  - How to exit the arrival area, either through border patrol or domestic?
  - How long will it take to get through customs/border?
  - Where to go to get baggage? Which carousel?
  - What to do if baggage did not arrive?
  - How to get to hotel (shuttle, taxi, metro, etc.)?
  - Where to go to get picked up?
  - Transportation location / cost (limo, taxi, shuttle, rental car)?
  - GPS acquisition and satellite accessibility?
  - What are the options at the local area?
  - What options are there at the airport for food and beverage, or entertainment?
  - Need to provide feedback to airport, airline, TSA, concessionaires, others?
  - Where is parking garage ticket?

The Team established the Passenger Journey Points by starting with the “Passenger Experience” flow, as shown in Figure 1, developed by IATA as part of their Fast Travel initiatives.

Figure 1. IATA Fast Travel Passenger Experience



The Team determined that for the purpose of this effort, this flow does not fully breakdown the various processes and journey points in enough granularity to track the points in which a passenger experiences the airport, an airline, concessionaires, and authority agencies (immigration, TSA, etc.). Nor does it address the timeframes between these steps to appropriately provide guidance for affecting a passenger’s travel experience. For these reasons, the Team further expanded the IATA flow.

The Passenger Journey Points are listed below with a brief description of each.

- ~ 01 Pre-travel - The effort the passenger goes through to determine how he/she will travel (Decision to make the journey). This includes: determining which airline, airport, and departure & arrival times, non-stop or connecting.
- ~ 02 Booking & Ticket Issuance - The process that leads to the passenger having a valid boarding pass
- ~ 03 Check-in - The process of checking in on a reserved flight online or on-site.
- ~ 04 Airport Arrival - The time from starting the travel to the airport until reaching the airport terminal
- ~ 05 Document Scanning - Step 1 of the Document Check process: Process of a passenger self-scanning travel documents
- ~ 06 Authorization to Proceed - Step 2 of Document Check process: System performs automated verification of the passenger travel document data against travel data requirements
- ~ 07 Baggage Processing – On-site or off-site process of printing bagtags, applying bagtags to luggage, and dropping bags
- ~ 08 Landside Dwell Time - Time from entering the airport building until passenger reaches security check-point
- ~ 09 Immigration Exit Control – In the US, Passports are checked at traditional check-in counters or through self-service kiosks. From Canada, immigration exit may be more separated from traditional check-in counters.
- ~ 10 Security Access – TSA reviews passenger and boarding pass and authorizes passenger to proceed to security screening.
- ~ 11 Security Screening – Process of passenger and carry-on luggage being screened for admittance into sterile area.
- ~ 12 Air Side Dwell Time - Time from passing security check-point until boarding the plane
- ~ 13 Flight Re-Booking - In the event of an irregular operation such as flight delays, misconnects or cancellations: Ability for a re-routed passenger to get proactively re-booked and deliver their new boarding token or re-booking options via a self-service channel.
- ~ 14 Boarding - Process of a passenger to self-scan boarding token to gain entry to the aircraft.
- ~ 15 Handoff between Airports - Time from entering the airplane at departure airport until leaving the airplane at arrival airport
- ~ 16 Air Side Dwell Time - Time from leaving the airplane at arrival airport until passing security
- ~ 17 Immigration Control – Also called passport control. Process of Immigration Agents reviewing passenger’s passport and authorizing passenger’s entry into the country.
- ~ 18 Baggage Collection - Process of locating and retrieving passenger baggage; includes opportunity to register a claim for lost/mishandled luggage

- ~ 19 Customs – Process by which passenger declares goods and associated value of goods being imported into the country.
- ~ 20 Landside Dwell Time - Time from passing security until leaving the airport
- ~ 21 Airport Exit - Time beginning from leaving the airport until passenger reaches his/her final destination

Figure 2, as shown on the next page, maps the Passenger Decision Points (represented as arrows) with Passenger Journey Points (represented as boxes) that could potentially correspond with a particular aspect of the passenger's journey. This diagram illustrates where in some cases, a particular process can be addressed at multiple points in a passenger's journey and places less emphasis on the traditional sequencing of these processes.



Figure 2. Relationship – Passenger Decision and Journey Points

## Self-Service Applications & Technology Inventory

The Self-Service Applications and Technologies Inventory, was developed during Task 2 as a basis for the commonly known self-service options. As the Project progresses, additional detail will be added as new initiatives are discovered. The final inventory will provide a comprehensive listing of all known self-service applications in operational environments and in development. When looking at applications or services in development, it will address areas where passenger needs are converging with innovative technology solutions. For example, a large number of passengers are relying on mobile apps for travel related information, however, these are typically provided by airlines, hotels, or third parties, all of which have an independent commercial purpose behind the solution offering. Airports have long been providing information and resources relative to the passenger's travel experience (flight information, rental car, hotel, restaurant, sightseeing, etc.) to passengers on the airport property. This same information can be provided through a single contact point by the airport via a mobile app or website. To that extend, many major airport have implemented or are in the process of developing their own proprietary mobile apps.

For each self-service application or technology, the inventory will identify the relevant point in the passenger journey, as well as define the benefits and impacts. This inventory will continue to be developed as additional information is identified throughout the course of the case study task.

The draft version of the Self-Service Applications and Technology Inventory, as shown in Appendix D, lists details, such as specific examples, general description, and vendors of various self-service applications and technologies. The inventory is currently undergoing updates and an expanded and revised draft will be submitted prior to the Interim Report Review meeting with the Panel. Based on the total research efforts so far, the following provides a summary listing of the various self-service application areas (linked to the overall passenger journey points) and related application categories.

- Information / Wayfinding / Directory / Assistance
  - Physical Solutions (e.g., Virtual Assistance, Kiosks, Interactive Touch Screen, Robots, etc.)
  - Hand-held Devices for Roving Agents
  - Portable Device Apps (Airport / Airline Information; Flight info/tracking; GPS Positioning; Augmented Reality, etc.)
  - Location-based Services (Wireless Tracking Technology)
- Baggage
  - Remote Baggage Processing (Hotels, Parking, Public Transportation stations, Convention Centers, Malls, etc.)
  - Baggage Reconciliation
  - Self-Bag Drop
  - Remote Bag Collection
  - Self-Tagging Kiosks
  - Home Printed Bag Tags
  - Electronic Bag Tags
  - Self-Check-in Apps for Mobile Devices (Airlines & Airports)
  - Self-Service Kiosks for reporting lost baggage
- Check-in
  - Self-Service Check-in Kiosks
  - Common Use Self-Service Check-in Kiosks
  - Passenger Reconciliation System
  - Hand-held Devices for Agents
  - Social Media Check-in

- Remote Media Check-in
- Security / Immigration / Customs / Border Control
  - Self-Service Kiosks for Passenger Preparedness
  - Automated Security Screening (TSA Pre-Check; CLEARcard, e-passport)
  - Queue Measurement and Display Times (Blue-tooth in mobile devices)
  - Customs/Border Control Kiosks (Automated screening/biometrics plus agent questioning)
  - Exit Lane Self-Service Gates
- Boarding/Gates
  - Passenger Self-Boarding
  - Rebooking Kiosks
  - Rebooking App
- Mobile/ Web Applications
  - Airport Car Rental Apps
  - Airport Concessionary Apps
  - Proprietary Ticket Purchase App
  - Airline Proprietary App
  - Airport Proprietary App
  - Airport Website
  - Airline Website
- Parking Services
  - Pay on Foot
  - Electronic Passes
  - Wayfinding Assistance
  - Cell Phone Lot Services
  - Premier Parking Services
  - Other Premier Services
- Facility Services
  - Facility Feedback
  - Passenger Survey
- Others
  - Virtual Shopping Wall/Store
  - On-line Travel Agency
  - Instant Feedback System
  - Ticket Purchase Kiosks
  - Airport Wireless for Internet Connection
  - Distributed Antenna System (DAS) / Wi-Fi
  - Power Options
  - Computing and office options
- Technologies
  - RFID Bag Tags
  - NFC (Near-Field Communications)
  - QR Codes
  - Barcodes
  - Blue-tooth
  - WiFi
  - Social Media
  - RSS Feed

- Gadgets/Widgets

## **Business Drivers**

The identification and understanding of primary business drivers is an important and necessary step in determining an airport's strategic direction. The proper evaluation of these business drivers, based on relevance and priority, assists an airport in its efforts to develop successful self-service related strategies, and therefore dictates the type of solution that may be implemented based on its expected benefits.

Research identified the following general business drivers:

- Reduce congestion and improve passenger flow
- Avoid / defer capital costs
- Improve quality of service to passenger
- Improve quality of service to airlines
- Increase opportunities for airlines to add or expand service
- Gain a competitive advantage over other airports
- Identify new commercial/revenue opportunities
- Align with strategic plan
- Improve facility space utilization

Examples of some specific business drivers include:

- Provide clear financial benefit
- Improve overall customer experience
- Improve check-in, security queuing, boarding, on-time performance
- Reduce passenger complaints
- Relieve the airline of having to execute in-person service
- Reduce airline operating costs and improve efficiency
- Avoid competition with airlines
- Improve departure control
- Utilize existing technologies

As the Project continues, especially during the case study phase, more specific business drivers addressing unique perspectives of the different self-service applications will be discovered and analyzed.

## **Benefits**

The evaluation of the various self-service applications includes a comprehensive analysis of quantitative and qualitative benefits. For the purpose of this Project, benefits are grouped into the following categories, as benefits vary for different stakeholders:

- Passenger
- Non-Traveler
- Airports
- Airlines
- Concessionaires
- Regulatory/Security

Research to date has revealed a multitude of general benefits across all categories of adopting a self-service approach, including:

- Cost savings through reduction in staff & of the real-estate footprint

- Reduction in dependency on aeronautical revenues
- Increase in passenger processing capacity
- Reduction in time required for the check-in process of a given aircraft
- Competitive advantage to an airline/airline
- Increase in customer service
- Reduction of required counters
- Creation of improved processing efficiencies
- Creation of new business opportunities
- Operational benefit in understanding passenger location status for flight departure

Examples of some of the specific benefits include:

- Self-service costs are distributed among all airline users in a common use model, which can help create a lower cost of entry and less capital costs for airlines.
- Self-service can create efficiencies for passengers, reducing dwell time, and resulting in increased competitiveness against vehicular traffic for short distances.
- Self-service in a common use environment can create a loss of airline responsibility for customer care, which may provide a lower cost of entry and sustainability.
- In a self-service implementation, a customer-friendly means must be put in place to direct passengers to the new self-service approach. This can create an opportunity for a positive customer service impact.
- The self-service process for self-tagging is common use/dedicated use neutral, and accommodates varied airport layouts, which can provide flexibility of configuration and installation.
- Training agents to work in a self-service environment requires less time and effort than traditional agent training requirements, which creates a cost savings for the airlines.
- Self-service creates an increased reliance on hardware and technology, which can allow new areas of efficiencies and opportunities.
- Self-service provides opportunities for control and efficiency that is increasingly expected by younger generations.

As the Project continues, especially during the case study phase, more specific benefits addressing unique advantages of the different self-service applications will be discovered and analyzed.

## Impacts

In the current airport environment, most agree that a move to providing more self-service opportunities is beneficial. The consequence of this however, is that many of the traditional terminal areas, such as the check-in lobby become inefficient. As the internet and wireless revolutions continue to explode, airports are finding that the current infrastructure is often inadequately prepared to meet the demand. In addition, as the level of services provided by the airport increase, requirements for associated policies, procedures, and practices increase. Therefore, as the Team investigates self-service, it must take into account the various impacts new self-service opportunities have on the physical and technical infrastructure, as well as the business practices. These impacts can be grouped into commercial, planning, facilities, legal, financial, risk, operations, regulatory, security, and technology. The following sections provide areas of impact for each of these categories.

### *Commercial*

- New opportunities
- Coordination/cooperation with stakeholders
- Information sharing for mutual benefit
- Stakeholder operational processes changes
- Stakeholder business model changes
- Lease agreement changes
- Airline branding
- Marketing program changes
- Concession advertising

### *Planning*

- Strategy development
- Current conditions assessment
- Requirements analysis
- Feasibility studies
- Business Case definition
- Stakeholder business model evaluation
- Management, administration, and maintenance planning
- Passenger demographic evaluation
- Passenger flow/demand evaluation
- Baggage exception rules evaluation
- Baseline processing measurement
- Facility capabilities/limitations evaluation
- Growth projection evaluation
- Design
- Customer service plan development
- Usage plan development

### *Facilities*

- Facility zone mapping
- Space reclamation
- Counter removal

- Baggage handling system modifications
- Check-in area modifications
- Security checkpoint modifications
- FIS modifications
- Hold room area modifications
- Concession area modifications
- Curbside modifications
- Baggage claim modifications
- Baggage make-up/storage area modifications
- Parking area modifications
- Electrical infrastructure modifications
- Data infrastructure modifications
- Telecommunication space modifications

### *Legal*

- Contract negotiation
- Modification of job duties

### *Financial*

- Revenue opportunity
- Funding requirement
- Price drop
- Rates and charges

### *Risk*

- Competition with stakeholders
- Quality of service
- Contract breach
- Unidentified costs
- Shared responsibilities with other stakeholders

### *Operations*

- Operational support requirements
- Staff addition
- Staff reduction
- Staff training
- Outsourcing requirements
- Service level agreements
- Rule of carriage changes
- Passenger rights accommodation
- Accountability policies and procedure development
- Continuity of operations program development
- Irregular operations procedure changes
- Off-site check-in procedure development/change
- Shared use agreement development/change

- Existing stakeholder equipment/infrastructure purchase
- New equipment/infrastructure purchase
- Configuration and change management process development/change
- Mishandled bag policies/procedures development/change
- Accessibility requirements compliance
- Signage program development/change
- Airline proprietary equipment placement/use
- Common use equipment placement
- Airline customer service model
- Airline staffing model
- Maintenance management policies/procedures
- Moves/Adds/Changes policies/procedures
- Equipment standardization
- Queue management
- Asset management
- Consumables standardization
- Consumables management
- Manual operating procedure development/change
- New business function development
- Common Use program
- Gate/Resource management
- Social media presence management

#### *Regulatory*

- CBP staffing resources
- Baggage activation process
- Identity verification process
- Baggage acceptance policy
- PCI/DSS policies/procedures
- DOT kiosk accessibility requirements
- Information sharing between regulatory bodies and/or airlines

#### *Security*

- Checkpoint staffing resources
- Video monitoring capabilities
- Behavioral analysis capabilities
- Baggage screening process

#### *Technology*

- IT staffing for new management, administration, and maintenance requirements
- Electrical power requirements
- Wi-Fi infrastructure
- Cabling infrastructure
- Cable management system
- Data sharing
- Data storage

- Document management
- Server architecture
- Network architecture
- Workstation architecture
- Common Use Passenger Processing equipment
- Common Use Passenger Processing application
- Common Use Self-Service kiosk application
- Peripheral purchase (scanners, printers, handheld devices, etc.)
- Technology standards development/change
- Data feed
- Telecommunication connection
- Message broker
- Baggage reconciliation system
- Message distribution system
- Baggage tracking system
- Baggage handling system
- Application development/management
- Mobile app development/management
- Website development/management
- Information display system
- Airline applications

These impacts will continue to be refined during the case study task, and as the draft Guidebook is developed, the specific impacts for each self-service medium will be thoroughly defined.

### **Extent of Integration**

The identification of potential integrations of other passenger and non-passenger self-service applications to facilitate employee and tenant services constitutes a very important element of the Guidebook. Therefore, as discussed earlier in the Data Analysis Approach section, this area has been identified as a primary focus for the case study effort. This will enable the discovery of commonalities between various self-service solutions that create opportunities for integration, whether it is physical system & process integration (airport and airlines), or even planning, design, or service provider integration.

Research results in this area are presented in Table 2 on page 7.

### **Partnering Stakeholders**

In order to properly research, evaluate, and provide guidelines for self-service, it must be considered from the three equally important vantage points: The Passenger, the Airline, and the Airport. As Airport IT becomes more and more integrated, cooperation with various stakeholders is essential. Research to date identified the following stakeholder groups:

- Passengers (Travelers)
- Non-passenger customers
- Airlines
- Concessionaires
- Vendors (e.g., retail, services, IT hardware & services, telecommunications)
- Regulatory Agencies (e.g., TSA, FAA, CBP)
- Industry Associations (e.g., IATA, ACI)

- Off-airport entities (e.g., hotels, convention centers, theme parks, shopping malls, car rental facilities, casinos)
- Municipalities (cities, counties, states, federal)
- Airport Authorities

The identification of associated infrastructure and airport/airline/other stakeholder integration requirements of multiple self-service applications (e.g., physical space, technology) is therefore also relevant. During the initial research phase, only a few airports indicated significant effort to create integrated self-service strategies with various stakeholders. Therefore, stakeholder coordination and collaboration is identified as a research gap that will be specifically addressed during each of the upcoming case studies.

## Case Study Research Results

This section summarizes the results of the case study effort. The information here and in the accompanying attachments provide the full breadth of the case study research.

Results obtained during the literature review and interview phases have resulted in very valuable information for the Guidebook and are provided in the following attachments

This Case Study Summary Report provides a high-level summary of the key highlights / take-aways from each of the Case Studies conducted for the ACRP 10-17 project. The information contained herein is a crucial component in the development of the Guidebook. Greater detail on each Case Study can be found in the specific Case Study Report for each location included as attachments.

### Case Study #1: Narita International Airport Corporation (NAA)

The NAA has put in place an overall airport improvement strategy focusing on improving passenger services in general, with a special emphasis on passenger self-services, as encapsulated in its “i-Airport” initiative. It provides the fundamental basis for how the NAA assesses, establishes, plans, and tracks success of technology projects related to passenger self-services at all passenger journey points. It also includes how these IT initiatives integrate with each other, and how associated changes may impact other passenger self-services.

#### *i-Airport*

The NAA has adopted an “i-Airport” strategy, as a part of the overall airport improvement strategy. The Definition for “i-Airport” is given as:

*Utilizing cutting-edge information technology, we will optimize overall airport procedures, including security and operational efficiency. At the same time we will provide advanced airport service under the concept of a simple, fast and friendly airport, with a view to offering greater convenience for our customers.*

#### *Planning*

The NAA provided a detailed discussion on the approach to Airport Planning. Their internal analysis focused on understanding their competition from a local / regional area, then from a global perspective. By understanding their competition, the NAA could then analyze how to improve its own internal processes; of which the time a passenger takes to arrive and go through the airport was key. The NAA has also started to assess how well the airport, along with its airline tenants, complies with IATA’s Simplifying the Business (STB) objectives. By doing so, the NAA plans to improve the self-service process across all passenger journey points. Once Planning has established the overall objectives, the IT Planning, IT Development and Planning Department then establishes IT projects and goals to help achieve the overall objectives.

## **Case Study #2: Japan Airlines (JAL)**

### ***QuiC***

JAL recognizes that their primary competition for Domestic Airline travel is the ‘Bullet Train’, where this train has made travel between Japanese cities quick, convenient, and on-time. In direct response to this competition, JAL introduced the QuiC program in 2005. QuiC is the “world’s first IC check-in and boarding” system and covers all 52 JAL domestic departure airports. Through the QuiC program, JAL is now accepting at-airport check-in up to 15 minutes prior to aircraft departure time; dramatically reducing the overall travel time a passenger goes through when using JAL. In 2013, JAL was recognized as the “world’s top performer for on-time arrival.” Further information regarding the QuiC program is included in this Case Study Report in Attachment 2.

### ***Passenger Services through an Integrated Mobile Strategy***

The NAA provided a detailed discussion on the approach to their Passenger Self-Services Mobile Strategy Planning process. The Figure 1 illustrates the various touch points at which JAL is deploying the mobile strategy. Attachment 3 provides background information on the JAL mobile strategy planning approach.

### ***Improving the Self Service Check-in Process***

JAL provided a detailed discussion on the check-in process. For JAL airport check-in through self-service kiosks remains a vital link in the overall passenger process. As such, JAL continues to improve the check-in process by reducing the time a passenger takes at the self-service kiosk. JAL ensures that the time it takes to advance between screens remains under 1 second for all screen changes.

The Research Team also witnessed an extremely efficient boarding process, where by using self-service boarding gates, JAL boarded a 777 in under 12 minutes.

## **Case Study #3: Amsterdam Schiphol Airport (AMS)**

AMS is privately managed by the Schiphol Group, which in turn composes the Airport staff. This background is relevant for a better understanding of the content in this Report. The AMS has articulated an “ambition” to be “Europe’s preferred airport.” This ambition has translated into, amongst other things, an emphasis on passenger self-services and aviation industry innovations. This spirit provides the basis for evaluating current passenger experience and services, considering all options for improvement and for how the AMS assesses, establishes, plans, and tracks success of technology projects related to passenger self-services at all passenger journey points.

### ***Vision and Planning***

The AMS has identified as their “ambition” to be “Europe’s preferred airport.” This speaks to both the preference of passengers as well as airlines. Planning for passenger self-service takes a very

comprehensive approach and considers passenger self-services initiatives from the moment the passenger arrives at the terminal to when the passenger boards the aircraft. AMS is highly structured in their efforts toward achieving this ambition and the central aspect of this structure is the heavy use of surveys and studies. These surveys and studies generate the metrics that form the basis for identifying and justifying projects as well as evaluating total airport progress toward improving passenger service and experience. It should be noted that when considering airport capacity, the focus is not on the number of passengers but rather on the time spent at process points. For example, it is not as important to know that the number of passengers processed through a security gate has increased, as it is important to know that the time it takes a passenger to go through the security gate decreases.

In addition to the surveys and studies, AMS has a separate division (Passenger Services Division) that is specifically dedicated to the improvement of passenger services and processes and, therefore, reviews them from a strategic and tactical perspective. This division reviews the survey information and works with other airport staff, as applicable, to identify possible solutions (IT and non-IT) to noted issues. AMS also has a business information manager from the Information and Communications Technology (ICT) Division - AMS' IT division - that is focused on passenger services. This business information manager is the bridge between the Passenger Services Division and the ICT Division to ensure IT and IT integration is properly considered in the project planning. Project ideas are then further researched, developed, and proposed to an Investment Board that is made up of airport directors and that are responsible for all commercial activities. This investment board reviews the metrics, business cases, capacity studies, project timing, input from various airport managers, and overlap and interference that may exist between proposed projects.

A belief that drives many of the project decisions is that passengers are most happy when they are in control of their journey and are able to board a flight in a timely manner, regardless of terminal capacity or process points. This belief drives many of the decisions regarding common use and mobile services that AMS offers and why the airport seeks to prepare the passenger for their travel, as much as possible, prior to the passenger coming through the door. AMS also translates this to mean the passenger is able to use the Airport effectively as a dynamic meeting place. This thinking is aligned with the Airport Vision that, "An airport is viewed as an AirportCity – a dynamic meeting place." Considering its Vision, the Schiphol Group's Mission is, "To further develop AirportCities and AMS and to create sustainable value for stakeholders."

Since ICT manages the Information Technology at AMS, it is notable that in support of the overall Airport Vision, Mission, and Ambition, ICT has established its own Vision, Mission, and Ambition Statements:

***Vision:***

*Innovative, professionally managed IT systems are essential for the business success of Schiphol Group.*

***Mission:***

- *Supporting the airport operation*
- *Managing IT complexity*
- *Initiating and facilitating business innovation*

***Ambition:***

*Being the business' preferred IT partner*

The Schiphol Group and ICT determined the following key drivers are necessary to help achieve the Vision points discussed above:

- Self-Service enables the passenger/consumer to be in control
- Common Use provides the Schiphol Group the means to lower costs to the airline

***Business Cases***

All projects require a business case be developed to indicate what problem is being solved, what risks are associated with the project, and what benefits are anticipated. Though AMS does not value innovation for innovation's sake, it does not shy away from risk if there is sound thought behind a new solution idea and subsequent expected benefit garnered in a successful project. Such information is provided as part of a project's business case analysis. The two key aspects of business cases targeted at passenger services and processes are: (a) do passengers like it, and (b) does it free up staff?

***Passenger Tracking***

A limited form of passenger tracking is used extensively to measure and monitor passenger queue wait times and passenger behavior and tendencies throughout the Airport. Passenger tracking is used to understand security queue times, passenger movement throughout the airport, shopping preferences of passengers on specific flights, and use of various passenger services including passenger self-services. Passenger tracking is "limited" in the sense that passenger specific information (i.e. name, gender, age, etc.) is not used or logged in any way. Airline and authorities have verified that the Passenger Database does not store sensitive passenger information. As passenger data is a vital part of understanding passenger movements, decisions, and tendencies, AMS seeks to capture as much non-sensitive passenger data as possible with the idea that AMS can figure all the various ways this data can be used later.

***Data Architecture***

A standards-based data architecture is at the foundation of Schiphol's ability to share data between the various data systems. An architecture such as this allows for new systems to be deployed while providing data that is usable by all and that can be consolidated into a single database that is populated by information from each of the various systems.

***E-business/Social Media***

Schiphol's E-business includes the management of the Airport's website, email marketing, intranet, and extranet (communicate with an internal group of people, i.e., airline managers) and extends through social media. All media channels are measured and this information is used to try to improve each of them to better engage and meet the needs of users of these channels. E-business also advises the different departments of the Airport on how to do their business digitally. At Schiphol, social media is a part of the overall process to please the passenger and give them an effective distraction to help them forget they are traveling. Measuring an Airport's return on investment with social media is difficult, but AMS views engaging in the use of social media a must. AMS' E-business perspective is, "[The passengers] are calling, [the Airport] has to answer." Airline to Airport cooperation is happening at AMS and is highly valued. This occurs on a daily basis when passenger messages are received through social media and

passed on to the appropriate party to respond. It also occurs at regular intervals throughout the year as AMS' E-business meets with the airlines (for example, meetings with KLM occur four times per year) to specifically discuss social media and working to improve coordination and responses across all media channels.

### ***Airline Cooperation***

As previously mentioned, AMS seeks to be Europe's preferred airport for airlines. This ambition is largely the impetus for the close cooperation between Schiphol and its airlines and particularly its dominant carrier, KLM. It is important to AMS to develop this basis of cooperation with its airlines before starting the logistical aspects of a project as it helps projects to run more smoothly and increases the likelihood of the Airport and the airlines both working toward a successful project outcome.

### **Case Study #4: KLM Royal Dutch Airlines (KLM)**

KLM has a dedicated team for E-services (on-line check-in, baggage, lounge, etc.) and is looking forward to advancing innovative passenger services as passengers continue to become more comfortable and increasingly expect to self-serve on-line and through mobile devices.

### ***Vision***

The three key components of KLM's E-Development vision for passengers are:

- Deliver the right service, at the right touch point, at the right time
- Provide as much of the process as possible off the airport
- Give the customer as much choice as possible.

These three components drive innovation in KLM's services and align the airline well with the Schiphol Airport's drivers, smoothly pairing the airport and its dominant airline.

### **E-services as Revenue Opportunity**

KLM is looking to E-services as a relatively new opportunity for revenue generation. Customers are always online, even while at an airport. With that in mind much thought is being put into how KLM can best make use of a passenger's dwell time and location information in order to best reach the passenger and create opportunities for up-selling additional services. Expounding specifically on the aspect of geo-location, Mr. Zwerink stated that location-based services are upcoming. This capability is important to the airline as it will allow KLM to better service their customers by reducing delays in such instances as holding planes for passengers that are "stuck" in customs. Knowing that the passenger is being held up means the Airline can make a better informed decision on whether to continue to hold the plane or pull the customer's baggage from the plane and begin rebooking the customer for another flight.

### **Metrics**

Metrics are highly valued by KLM for the purpose of understanding their customer and for evaluating initiatives meant to improve engagement, service, and customer experience. Customer panels, usability testing, on the spot customer interviews, and website click behavior analyses are all methods used to understand customers and to determine success of a new initiative to improve passenger service and

experience. Results of these studies and analyses provide results against key performance indicators (KPI) that help determine the effectiveness and value of a given initiative.

### **Airport Infrastructure**

Mr. Zwerink stated that an Airport's communications infrastructure is very important to KLM to allow the airline to service their customers and maximize operational effectiveness. It was noted that KLM's reliance on the airport infrastructure is most heavy at KLM outstations, where the airline has a small operational presence. In responding to a request for an example of a pressing airport-offered infrastructure item for KLM, Mr. Zwerink stated that a current KLM need at airports is for ubiquitous wireless connectivity including connectivity for ground services around aircraft and for other operational uses.

### **Development/Innovation Challenges**

The interview revealed a number of items that impact an airline's ability to develop and innovate its business.

- Authority regulation challenges and subsequent development costs to address them
- The ability to influence airports
- Collecting and analysis customer geo-location information
- Personal mobile devices and connectivity is not yet robust enough for roaming in an airport environment
- A new mindset needs to be forged in its agents

### **Customer Loyalty**

Customer loyalty is important to any business and it is true for both the airline and the airport. KLM puts much effort into increasing such loyalty through the customers' use of the KLM website as well as other multi-media offerings/channels. In discussing the previously stated question of, "Who owns the passenger," Mr. Zwerink stated that he is of the position that the passenger should be allowed and enabled to decide whether to use applications offered by airlines or the airport during their travel journey.

### **Case Study #5: Aéroports de Montréal (ADM)**

ADM is a not-for-profit corporation without share capital and is responsible for the management, operation, and development of Montréal–Pierre Elliott Trudeau International Airport and Montréal–Mirabel International Airport under the terms of a 60-year lease signed with Transport Canada in 1992.

#### ***Vision/Mission/Values***

Aéroports de Montréal's vision is expressed in these statements:

- *ADM aims to become an airport manager ranking among the best in the world, distinguished by the quality of its customer service as well as its rigour, efficiency, and innovation.*
- *Montréal-Trudeau will expand its role as a continental gateway and a dynamic hub for passenger traffic between Europe and the Americas.*

- *Montréal-Mirabel will continue to develop so as to consolidate its status as a world-class aerospace and logistics platform.*

*Building on experience and past successes, a seasoned team, and a flair for commercial and technological innovation, ADM plans to resume its consulting activities and win contracts to manage other airports.*

Aéroports de Montréal's mission is threefold:

- *Provide quality airport services that are safe, secure, efficient and consistent with the specific needs of the community.*
- *Foster economic development in the Greater Montréal Area, especially through the development of facilities for which it is responsible.*
- *Coexist in harmony with the surrounding environment, particularly in matters of environmental protection.*

***Airport Culture:***

Key take-aways regarding the Airport Culture included:

- ADM is dedicated to common use.
- Current emphasis is on non-airline revenues.
- There is an emphasis on how to become more efficient in regard to technology, infrastructure, and staff/organization.
- Passenger Transfer is on the increase:
- ADM thinks it is the role of the Airport to get involved with passenger flow and airline process issues. ADM believes the Airport should play a role in making changes – even if it's an airline "thing" -- to build what will be needed in the future and to help talk with government entities even if it's an airline request. It's easier for the Airport to talk to the regulators representing the airlines than for the regulators to talk with each airline.
- ADM believes that passengers want choices and each service responds to a specific need, therefore ADM offers a number of different services.

***Business Cases***

Key points to consider include:

- Does it improve the common use model?
- Does it improve the passenger experience?
- Does it improve passenger processing?
- ADM aims for zero cost. If there is a cost, it must be accompanied by a solid ROI showing an increase in non-aeronautical revenue or high cost deferral in capital expenditures.
- What is the value related to innovation?—ADM wants to innovate, but not necessarily on everything. Innovation in passenger experience, flow, and capacity is, however, a good thing.

***Data Analysis / Sharing***

ADM is collecting a large amount of data but at present, they are not doing much with it. One area where ADM is conducting data analysis is in analyzing passenger spending. Such analysis is being conducted based on passengers on a specific flight so ADM can ensure they provide the right products and services near the flights with the passengers that are going to buy them. ADM is not using any geolocation services right now.

***IT Architecture***

Starting last year, ADM realized their need to change their IT infrastructure to be ready for the future with a more stable infrastructure for systems. As a result, all IT infrastructure is in the process of being changed. ADM also made significant improvements to the airport wireless infrastructure, including several upgrades to the terminal wireless. With the work accomplished on the wireless infrastructure, ADM is now reevaluating the means to generate more revenue, while keeping passenger use free of charge.

***Automated Border Control (ABC)***

Automated Border Control (ABC) provides an accelerated process for the majority of passengers. ADM has installed the solution implemented at Vancouver. From the same real estate space, ADM drastically increased throughput, which made the business case easy. Simply adding this system increased customer satisfaction at the queue line. It also increased satisfaction after security and in the shopping areas, even though ADM didn't change anything in those areas. This attests to the intangible benefit of having the passenger more relaxed.

**Case Study #6: Seattle / Tacoma International Airport (SEA)*****Airport Strategic Focus***

SEA takes a top-down strategic approach to defining all initiatives within the airport. As such, there is a clear alignment from the Airport's Purpose and Strategic Goals to the Technology Strategies, from the Technology Strategies to the Technology Objectives, and from the Technology Objectives and the Airport's Investment Drivers to specific Initiatives.

SEA has three key Technology Strategies that all support passenger self-services:

1. Anticipate and plan for **innovation** in consumer and aviation technology
2. Encourage adoption of advances in **customer service** technology (ACI, ASQ, IATA)
3. Create a **culture** of technology enthusiasts and data driven decision making

SEA defines Technology Objectives in support of each Technology Strategy, for example:

1. Innovation – Create an ideal mobile device environment
2. Customer Service – Support airline self-service initiatives
3. Tech Savvy Culture – Support future business plan actions

SEA has seven Investment Drivers that influence specific initiatives over time:

1. “Keeping Up” (replace/upgrade)

2. NorthSTAR (North Satellite)
3. South Satellite (FIS)
4. Fast Travel (disruptive technologies)
5. Business Plan
6. Simplifying the Business (StB)
7. Checkpoint of the Future with Array Motion Imaging

### ***IATA***

IATA Fast Travel has significant implications for facilities planning to enable “Self-service Everything.” SEA is a strong supporter of IATA Fast Travel and embraces it as a “Disruptive Technology” that is driving self-services. They closely track advances proposed by the IATA Passenger Experience Management Group.

SEA notes four implications STB 2011:

- Mobile devices will play an increasing important role in the travel experience
  - Although touch screen kiosks remain an IATA priority
- Increased interoperability between business partners is required for the future traveler
  - Requires new data communication standard
  - Reduces the proprietary nature of PAX handling systems
- Secure data sharing is required between airlines, airports, and governments
  - Curb to gate requires tighter real-time system integration
- IATA STB has renewed emphasis on data exchange protocols – seamless integration

### ***Mobility Strategy***

SEA is embracing the fact that mobile devices are rapidly evolving, and airlines are counting on them to revitalize the passenger experience. They have developed a detailed mobility strategy to ensure that passengers are both well informed and well prepared for their airport travel experience and that the Airport anticipates and keeps abreast of mobile device innovation by making sound technology investments in passenger mobility infrastructure. The strategy includes the following four goals:

- Mobile Ecosystem Support
- Unique Mobile User Experience
- Real-Time Information Broker
- Robust Wireless Infrastructure

For each of these goals, SEA has developed a set of specific objectives and strategies for achieving each.

SEA takes the position that smart phones are integral to the passenger experience:

- Check-in process available on your device
- Smart Phone boarding pass
- Flight and bag claim information
- Location-aware, enhanced way finding and targeted concession advertisements – require Smart Phones

In addition, it is believed that mobile devices will reduce the cost of operations and maintenance by replacing the paper processes being used today.

## **Case Study #7: Greater Toronto Airport Authority (GTAA)**

The Greater Toronto Airports Authority (GTAA) is a private company which operates as a non-share corporation. It has the mandate to operate Toronto Pearson International Airport within a regional system of airports to enhance economic growth and development of the GTAA and to deliver outstanding aviation facilities to its customers, including air carriers and passengers.

The GTAA has continued to evolve as an organization since its incorporation in 1996 when it was split from Transport Canada. In 1997, the GTAA embarked on a 10-year, \$4.5 billion Airport Development Program (ADP) which was the single largest capital program in the history of Canadian airports and resulted in the construction of a world class facility. Upon the completion of the ADP in 2007, the corporation turned its focus from construction to operations to ensure the company was set up effectively to fully leverage its investment. In late 2009, the GTAA developed a brand strategy for Toronto Pearson with the following vision and mission and values all designed around shifting Toronto Pearson from being an airport operator to a commercially driven service provider:

**Vision** - *To be North America's premier portal to the world of possibilities.*

**Mission** - *To attract, serve and delight our customers by offering value through innovative products and services.*

**Values** - *Integrity, accountability, excellence, teamwork/collaboration and stewardship.*

In addressing the customer experience and in Passenger Services, the following three GTAA departments work very closely together.

1. Information Technology Management (ITM) - ITM is responsible for the Information and Communication Technology (ICT) infrastructure that powers the airport.
2. Operations and Customer Experience Group - The Operations and Customer Experience Group manages all of the processes that support the day-to-day operation of the airport. As one of the largest departments within the GTAA, its functions include:
  - Airside Operations
  - Consolidated Communication Centre
  - Customer Experience
  - Deicing Operations
  - Emergency Services
  - Groundside Operations
  - Resource Management Unit
  - Terminal Operations
  - Safety & Security
3. Strategic Planning and Airport Development - The Strategic Planning and Airport Development department is responsible for conducting benchmarking activities with other airports and

industries. This team conducts research on current and emerging trends to assess potential impacts and opportunities for the GTAA. This data is used to plan the future growth and development of Toronto Pearson.

### ***The Need for Change***

As the GTAA moved towards Operational Excellence, advancing toward its goals and visions set forth in 2009, it had become increasingly obvious that change was needed in how the GTAA managed and used data. The GTAA recognized that change was required to align with the global market and direction of technology. The GTAA required an overall system designed around industry standards and vastly improved capabilities in the sharing and use of data.

As the ITM pursued the opportunity of better utilizing a modern IT Architecture to support the GTAA's vision of becoming a true global hub airport, the GTAA also worked towards upgrading its existing IT Infrastructure towards a modern infrastructure consisting of the following:

- Message Broker / Enterprise Service Bus
- Service Oriented Architecture (SOA) messaging
- Industry based standards including XML schema objects and web services
- Enterprise wide Business Intelligence (BI)
- Virtualized server environment
- Enterprise Document Management System

The final vision for the GTAA's IT environment was to establish a reliable and stable system, and through integration with other GTAA systems create an enterprise tool allowing visibility to airport's day-to-day and historical activities. Through the implementation of a Terminal AODB, the GTAA will be able to analyze and improve on passenger flow. Through the integrated / enterprise solution, the GTAA will have the ability to improve utilization of airport assets (assign gates based on day-of-operations need. E.g.: Flights with connection passengers with minimum connection time to transfer to their next flight.

### ***Progress as of 2014***

As of August, 2014, the GTAA is well on the path to seeing its IT environment vision completed. Work to the IT infrastructure improvements is ongoing, with some notable achievements, including passenger wait time analysis. Expected by the end of 2014, the GTAA will have an IT based operations system that enables many of the following benefits:

- Dashboards that will display such items as counter allocations; gate allocations; sector usage; In-bound baggage carousels and out-bound lateral usage; connection passengers/destination or sectors accessed; trending – actual vs. planned; dwell time in various retail locations; passenger demographics, etc.
- Sharing key information with air carriers for wait times and passenger locations for improved decision making capabilities.

- Optimized use and allocation of in-bound baggage carousels and out-bound laterals that provide a better understanding of infrastructure usage and overall air carrier and ground handler performance details.
- Optimized transfer baggage processes based on real-time accurate data.
- Ability to better facilitate connections and to optimize services to create a better guest experience.
- Passengers will have visibility to expected wait times, such as at security check-points, or the wait times at USCBP or CBSA.
- Passengers will have a more comprehensive view of Toronto Pearson’s services (retail, food and beverage, etc.) that they can utilize during their visit.

### ***The Future State***

The improved IT environment and information-sharing system has already begun to unlock the “doors of possibility”. With the available information and infrastructure, future Passenger Self Services initiatives can now be planned for and implemented in far greater cost efficiencies and opportunities than ever before. One such example, the integration of an automated parking guidance system in order to provide information to the passengers, via a display screens at the Consolidated Communication Centre and on a Dashboard that can be accessed from any airport terminal. Passenger could access information on available parking spots by location. Such a system will give the GTAA the ability to forecast parking requirements, and using its available technologies, to direct customers and guests to available parking locations.

### **Case Study #8: Genève Aéroport (GVA)**

The Case Study was conducted at the offices of Genève Aéroport, from 10:00 AM to 5:30 PM on September 27, 2014. The purpose for the meetings was to investigate the passenger self-service initiatives at Geneva Airport, and to learn more of the planning process for such services. Research Team Members conducting the Case Study were Frank Barich and Ron Hiscox. The primary Genève Aéroport staff included Thomas Romig - Head of Airport Steering, and Jacques Morgenegg – Director of Landside Operations, and Airport Sponsor for this case study.

Genève Aéroport is the name of the Independent Public Establishment that manages Geneva airport. Its main activities include aeronautical operations, apron control, planning and building, maintenance and cleaning, safety and security, the running of the car parks, administration, financial management, business and buildings management, marketing, environmental management, and human resources management.

### ***Vision/Mission/Values***

Genève Aéroport is committed to succeeding in developing its airport facility to its full potential and satisfaction of it the people who use it. From this perspective, the following mission statements are provided.

Thomas Romig, in charge of Airport Steering maintains the following Mission:

- To maintain the performance, punctuality and smooth flow of airport operations and the quality of services to customers of Genève Aéroport.
- To ensure continuing airport authority, including by ensuring the availability of a standby service.

- To coordinate and plan operational activities between the services of Genève Aéroport and partners so as to ensure optimised flows and operational safety.
- To manage, organise and coordinate emergency situations.
- To present an image of airport activities that are up-to-date and appropriate to the operating situation.
- To monitor airport activities in order to improve the service to customers, especially punctuality.
- To keep partners and passengers informed.

Information and Communications Technologies maintains the following Mission:

- To implement, maintain and develop Genève Aéroport's IT infrastructure and telecommunications systems.
- To improve and simplify airport processes by the application of appropriate information and communications technologies.
- To propose information systems appropriate to the needs of Genève Aéroport and its customers, and to provide their support and development.
- To provide users with a suitable computerized working environment and ensure its proper functioning and use.

***Business Need / Project Organization / Business Cases***

To evaluate performance and business needs, Genève Aéroport starts with establishing a baseline using the ACI ASQ program, then we add our own Key Performance Indicators (KPI). The Airport Steering group (under Airport Operations), headed up by Thomas Romig is responsible for defining and monitoring all KPIs, and for establishing the business cases for future project needs. In monitoring progress, they establish trends and look for the areas of concern, using the Red, Yellow, Green color codes to help define hot spots.

To establish the business need and project identification, Genève Aéroport has put together a project organization that helps to facilitate project definition and priorities. This organization starts from Airport Operations, and then through close business relations with IT, translates into projects. Since the project definition begins with Operations, project prioritization and ultimate project approval is accomplished quite successfully. Once the high priority is established, the projects typically move forward.

In considering the passenger experience, it is a challenge to try and determine if it translates directly into spending more money. Some initiatives, such as with improved Web options for purchasing goods, are easier to track. Most initiatives, however, are not as easy to track. As a result, Genève Aéroport attempts to weight the passenger experience with the cost of the project.

***Passenger Service Project Approach***

When considering passenger self-services, Genève Aéroport considers the need of the passenger through the following five process steps:

1. Pre-Arrival
2. Arrival
3. Security Checks
4. Airside
5. Boarding

In these five journey points, all passengers process through the airport; whether the passenger is destination based or transfer passenger. If the passenger is a transfer passenger, then these five process steps are evaluated to see where the passenger is and when and where in the 5 steps. Genève Aéroport is in the process of measuring total Passenger Processing Time across all 5 steps. This extensive effort involves Genève Aéroport Marketing and considers comparison values with ASQ ratings.

Genève Aéroport has initiated a new program known as “Seamless Travel”, where this program is currently considering project initiatives under the Arrival and Boarding process steps. This program is expanding and has plans to consider project initiatives in the future across all process steps. Ongoing and future projects are discussed in the “Self Services Initiatives” section of this case study report.

### **Case Study #9: Frankfurt Airport**

The purpose for the case study was two-fold:

1. To attend the ACRIS meetings, which had an emphasis on common data exchange, related to passenger processing and self-services
2. To investigate the passenger self-service initiatives at Frankfurt Airport, and to learn more of the planning process for such services.

Fraport is among the leading groups of companies in the international airport business. With Frankfurt Airport, the company operates one of the world's most important air transportation hubs. Frankfurt Airport has become Germany's third largest airport, with more than 58 million passengers a year travelling through its two terminals. As an experienced airport manager, Fraport is expanding Frankfurt Airport together with partners into Frankfurt Airport City – an outstanding real-estate location and gateway of mobility and excitement.

#### ***Vision/Mission/Values***

We professionally develop mobility, making it an exciting experience for our customers. As an airport group we are the most strongly performing player in all business segments of the industry.

- For Fraport, airports are worlds of excitement as well as intermodal hubs. We systematically link different modes of transportation.
- At all our locations process efficiency and innovation is our hallmark. Our success is based on competitive integrated services, which flexibly meet our customers' requirements.
- Our top priority is safety and security.
- In pursuing our business, we create sustainable value for the benefit of our shareholders, employees, and the regions where we are located.

#### ***Airport Culture:***

As part of the “Great to have you here!” initiative, Frankfurt Airport has been optimizing many aspects since 2010. They include waits at the security checkpoints, signage in the terminals, display of walking times to gates, the friendliness of personnel and much more. Fraport achieved its goal of a passenger satisfaction index of 80% by 2015 as early as 2012 and continued it through 2013. In 2013, Frankfurt Airport had a baggage performance index of only two misrouted pieces of baggage per 1,000. The

punctuality rate at Frankfurt Airport in 2013 was excellent, reaching 82.3% despite greater air traffic volumes.

### ***Business Need / Project Organization / Business Cases***

Business need is established through the following:

1. Passenger input through surveys
2. Evaluation of competition airports
3. Input from key airlines and other stakeholders
4. Comparison ratings from Skytrax

Terminal Management (under Operations) performs the planning for passenger related requirements. We (IT) therefore views Terminal Management as our customer.

### ***Self-Service Initiatives***

Innovative concepts and systems have been introduced in order to guarantee competitive passenger operations at Frankfurt Airport. These are:

- easyPass
- Airport App
- MAM (Mobile Asset Management)
- MACS (Multi Access Control System)
- Passenger Self Tagging
- eGates
- Customer-oriented passenger service
- Concepts to improve passenger information
- Passenger flow analysis

### ***Data Analysis / Sharing***

Fraport uses and AODB concept for collection and sharing of data through selected stakeholders. Fraport has initiated a “Big Data Strategy”, utilizing a BI platform and virtualized servers. All analytics are performed in memory. Fraport uses the data collected for passenger analysis. Analyzed information is then provided to Terminal Management.

### ***IT Architecture***

IT infrastructure is based on the Service Oriented Architecture (SOA). Bus technology is employed at a layered level, where each stakeholder groups would maintain their own Enterprise Service Bus (ESB) domains. Fraport then connects the domains for information sharing.

### **Case Study #10: IATA Passenger Experience Management Group**

IATA's Passenger Experience program addresses the end to end passenger journey from ticket purchase through to arrival at destination. It comprises a range of projects to improve the travel experience and help reduce unnecessary operational costs to the industry. One of the primary delivery channels is self-service options for passengers where it makes sense. In process areas controlled by government authorities, such as Security, Immigration and Customs, Passenger Experience will improve the facilitation of these

processes by harmonizing passenger data requirements and enhancing passenger preparedness to reduce queues and process times.

### ***THE FUTURE PASSENGER PROCESS***

#### Consider the 14 steps Passenger process – why 14 steps?

- How can we make future travel a more seamless experience
  - Holistic approach and review of the 14 steps

#### Look at consolidating the 14 steps into the following:

- Pre-Travel
- Departure
- Flight
- Arrival
  
- Consider giving the passenger a “token”
  - Data exchange
  - Consider Check-In
  - Will the airlines know the passenger at time of purchase
  - Why do I need to even tell the airline / airport that I am here and ready to fly?
  - Will we have to do the same number of process steps in the future
  - The question is what will happen at the airport
  - Some airlines have eliminated check-in
  - There are still airports that have check-in
- Consider the process steps for the passenger throughout the journey and how the airport can facilitate off-airport check-in steps
  - Government perspective – there will always be the requirement to validate the document with the passenger – we need to authenticate the passenger
- Consider biometrics
  - With regard to all these steps, it is key to get assurance of passenger validation (be it on-line or in person).
  - Purpose is to eliminate the multiple steps of validation the passenger must go through (i.e. just one token) – so what is the token going to be?
  - E-Passport is the token that we should be moving to.
  - Is there a way to customize the passenger flow from the customer perspective?

#### How will mobile devices facilitate the passenger process and how would they interact with the common use infrastructure?

- Mobile devices will be at the center of airport travel
- It is the capability that is needed – you can do on your mobile device as much as the airline can do
- From the airline perspective, the mobile platform is already there, it is how the airport and airline work together
- Iberia – mobile device is / should be used in the airport to facilitate way finding and helping to travel through the airport
- Mobile device at the airport for boarding pass and printing of the boarding pass
- BA – getting the mobile phone, which will communicate with the ATO for getting a bag tag

- Actual infrastructure is needed – we are still waiting on airports
- Mobile devices – what should be integrated and what should be common use platform
- Can airports make data services available for the airlines, while removing the information silos
- The future of mobile for passengers is a proactive, service-driven environment
- AC – IROPS, flight registration

Payments at airports using a shared infrastructure - So where would you like to see card payments being done at the airport?

- KLM – it needs to be a combination: chip and pin at kiosk, or at desk; biometrics, etc.
- From a common use environment, how do you want to use this at the airport?

***Regulatory Aspects affecting the industry – discussion***

Changing the way we develop data exchange standards

- New program in IATA – INDUSTRY DATA MODEL

Accessibility for passengers with reduced mobility

- A4A – working closely with IATA

Issues and challenges with regulatory aspects

- Examples: mobile boarding passes since 2006
- Existing Technology (e.g. BCBP, kiosk, accessibility)
- New Technology (e.g. home printed bag tag, electronic bag tag)
- Incheon will start mobile boarding passes next month

Biometrics Update - Key principles

- Following ICAO guidelines
- E-passport is the token to be used to carry the biometric for international travel
- Standards around the use of e-passports should not preclude non-passports
- Government issued biometric token for non-international travel
- Data protection compliance
- Passenger authentication is a precondition to biometric enrolment
- Do the process only once
- Heathrow – T5 BA Trial – test enrollment and verification

What is the business case for airlines and airports to implement biometrically driven passenger processes - Biometrics in common use environment

- IATA to initiate a traveler identity scheme

US Entry – Homeland Security - Planned testing evaluation criteria and assumptions

- Homeland Security set up the Maryland Test Facility (MdTF)
- What about mobile technology?

Cooperation across the industry and air travel value chain to integrate holistic real time information throughout

- Flight information is the example
- Who has the information?
- Who needs the information?
- Who is the trusted source?
- When should the information be provided?
- Tools and channels to be used?
- What information should be exchanged across all touch points for better customer servicing?
- Information should be consistent across all platforms
- There are certain apps, such as flight radar 24
- Per IATA, all member airlines will be required to track baggage by xxx, 2015.
- The vision: delivering consistent travel communications through all touchpoints

***Aviation Trends***

Stewart at Heathrow

- It's about collaboration
- "Airport facilities today were built around requirements of yesterday and advances in enabling technologies to deliver "Fast Travel" could potentially stretch these facilities if Airline and Airport roadmaps are not aligned."
- We need collaboration and the vision to start with
- We looked at IT infrastructure, but 6 years ago
- We have to work together with the airlines
- We did a project around i-beacons

***Discussion on elements raised during the Passenger Experience Groups***

- Common use tablets
  - Questions were raised to understand the use of these tablets at both check-in and at the gates
  - Would airlines expect airports provide these tablets? – probably not
  - Does CUPPS on tablets fit into the technical specifications?
  - There will be a version issue with going to new technology on the tablets
- Biometrics
  - Start looking at the interfaces
  - We need a minimum specification from the airlines for the common use
  - Industry standards on biometrics?

**Case Study #11: Port Authority of New York / New Jersey (PANYNJ)**

***Passenger self-service initiatives implemented by the Port Authority***

Passenger Self-Service within the PANYNJ airports is driven by the airlines for the most part, with the Port Authority providing general services throughout the system (EWR, LGA, and JFK) and managing just Terminal B at EWR.

An example of airline based self-service initiatives is that United is preparing to begin do self-boarding. When an initiative is moving forward by a tenant, the tenant must file a Tenant Alteration Application (TAA) with the Port Authority. The Port Authority must approve the initiative from a customer service perspective. The TAA is assessed for wayfinding signage and ADA compliance.

### ***Approach to defining the business case of passenger self-services***

Business cases for passenger self-services begin with the customer satisfaction surveys conducted every year. Programs are developed based on what customers are asking for, which recently have been charging stations and free wifi. Survey results are coordinated with airline and concession partner and result in system-wide improvements to customer services. United used the data to get corporate support for renovating restrooms, Delta made investments in LGA based on survey results, and destination information helps drive what concessions will be successful. The next step in the process beyond the surveys is to define pilots for new initiatives. These have been conducted with the TSA, CBP, and other stakeholders for initiatives such as global entry, APC, and mobile boarding passes at TSA. Pilots work well for the Port Authority to evaluate probable success.

### ***Evaluation of community impact issues***

The Port Authority evaluates the travel to airports for the community, including travelers and employees. They collaboratively work to improve services from busses, trains, and the Long Island railroad. There is a Council for Airport Opportunity that provides a job coordination program focused on employment opportunities and Government / Community relations, as with the LGA redevelopment project.

### ***Evaluation of other impacts (facility, business, staff, technology, etc.)***

Impacts to other areas are evaluated as required. The Port Authority works closely with the airport staffs to determine impacts and make changes based on what is happening in the world. For example, the Planning Standards define requirements for concessions to be 20% pre-security and 80% post-security. The staff provides feedback during the pilots for adjustments.

### ***Key impacts to policies and procedures***

Policies and procedures are both centralized and airport directed. There have not been many self-service related impacts to these, other than regulatory issues. Airlines follow the PANYNJ Service Standards and Wayfinding Standards. The Port Authority assesses tenant quality standards and provides support to tenants in improving. The Port Authority has been recognized for ADA proactive compliance. The Port Authority also implemented a customer service training module into the badging process and it resulted in tenants seeking greater levels of training from the Port Authority.

### ***Performance measurement***

Performance for customer service in general is measured in a variety of ways, including:

- Mystery shopping twice a month
- Annual facility assessments
- Annual customer satisfaction survey
- Daily feedback from customers through lost and found portal, website, customer care connection, twitter

Quarterly reporting is conducted on customer feedback, and the results drive what is done in the airports for customer service amenities.

### ***Support for Passenger Service Initiatives driven by a tenant or other airport agencies***

There is support with the Port Authority for sharing information regarding good initiatives, but it is not formalized. The Aviation Department is actively building relationships with other Departments and have been able to help standardize the wayfinding in the bus terminal and have them build wayfinding kiosk based on the Aviation Department's design. The Aviation Department's sign standards have been adopted as Port Authority sign standards in general. There is a Customer Service Committee Port-wide.

As a result of self-service implementation by airlines, airline staff is reduced, which creating a lack of staffing to deal with general customer care issues. The Port Authority steps in to provide support, including helping to manage queue lines and taking care of people during IROPS. To that extent, the Port Authority has gone so far as to bus stranded passengers to the administration building to take showers.

### ***Review new Terminal A design for EWR***

The general theme for the new A Terminal at EWR is to only build what you need and maintain flexibility. The design for this terminal includes flexible infrastructure, multiple check-in options (remote, curbside, self, full), flexible hold room spaces, expandable security lanes, a new parking structure, and a connection to the AirTrain. The design drives toward self-service first and exceptions at the desk. Infrastructure will be installed to accommodate what is needed when the time comes.

For development of this design, airlines were included in monthly meetings. In this terminal, the Port Authority will have some involvement with common use. Intermodal access is planned for Path, NJ Transit, and Amtrak.

## **Case Study Impact on Guidebook**

As a result of the final round of case studies, it became evident that the industry is on the verge of a shift in vision for passenger self-service that would fundamentally change the nature of this guidebook. The original plan for the guidebook was to look at the passenger journey according to a linear approach of moving from one pre-defined process step to another. However, both ACI and IATA have recently refined their approach to viewing passenger self-services from a linear approach to a more virtual approach.

This new Stage is defined by the passenger's ability to self-customize and personalize the travel journey steps and, consequently, the journey itself. The aviation industry is beginning to realize that the passenger is pre-setting how he or she will travel through the passenger journey. As some of these options have costs associated with them, the choices available to the passenger are also dependent on the capacity of the traveler to pay for these options. In this Stage, everything is driven by identity and money. Depending on who you are and what you are willing to pay, certain processes are open up to you. More so than ever before, for the common traveler, identity and money are the fundamental enablers of a person's travel experience.

Unlike the previous Stages, the shift has not occurred as the result of a single new technology. Instead the shift has been the result of a number of integrated organizational efforts further embracing the

capabilities mobile technology introduced. These efforts provide airport processes and personalized experiences on the passenger's mobile device as much as possible and at the convenience of the passenger. These capabilities separate a process step from its traditional time and place in the airport process order and instead provide the passenger with alternative options for how and when to perform processes and, in some cases, through whom to perform them.

With this understanding, the airport operator must still manage the airport as a "common environment". Environment, being a general term referring to the facility, IT systems, policies and procedures, and all elements needed in managing the cohesive asset known as the Airport. By doing so, the airport then can facilitate the variations of the passenger and the experience as he or she travels through the various areas. It is through this means that the airport operator works with its airlines and other tenants, managing and accommodating the variations within each operating model.

The industry is now considering a far more simplified view of the passenger journey, and focusing on how to accommodate the passengers as they travel through these processes. As the Airport Owner, Airlines, and other major tenants consider how passengers travel through the required areas, planning across a common environment now takes on an integrated approach.

# THE GUIDEBOOK: COMPONENTS & HOW TO USE IT

The overall Guidebook deliverable includes an Executive Summary, an Overview (Part I), the Reference Guide (Part II), and Tools (Part III), which in turn is made up of three separate components: the Business Case Development Guide, the Passenger Self-Service (PSS) Inventory, and the Passenger Self-Service (PSS) Environment Map. The Guidebook also provides Appendices (Part IV), including a Glossary of Terms & Acronyms, an Annotated Bibliography & Resource Guide, and Enabling Technology Summaries. In addition, the accompanying CD will include various electronic files, such as PSS Inventory spreadsheet matrix, 1-page printable summary handouts of enabling technologies, and the PSS Environment Map executable application.

## Research Approach

The information to develop the content of this Guidebook was collected through various methods of research, including literature research, interviews, conferences, and on-site case studies. This was done to provide guidance to the reader based on the industry's most current implementations, experiences, and best practices. Primary research subjects included airports, airlines, and related industry associations, as well as technology vendors. Secondary resources included publications from airport/airline industry associations, other ACRP reports, as well as various aviation technology, self-service, and travel related Internet websites.

## Purpose & Intended Audience

The purpose of the Guidebook is to be a comprehensive, yet easy-to-use resource that will succeed in providing the user with all information and tools necessary to meet the project's primary objective: *"considering, evaluating, and making strategic decisions for implementing and optimizing a comprehensive passenger self-service experience for a variety of sizes of U.S. airports."*

Every effort was made to develop this resource as to be useful to a variety of airport (and stakeholder) personnel at various levels of responsibility, ranging from executive management to IT Division staff members.

This Guidebook was prepared and structured keeping in mind the varying needs of information the different types of readers would be interested in acquiring. To that extend, the following general user characteristics have been identified:

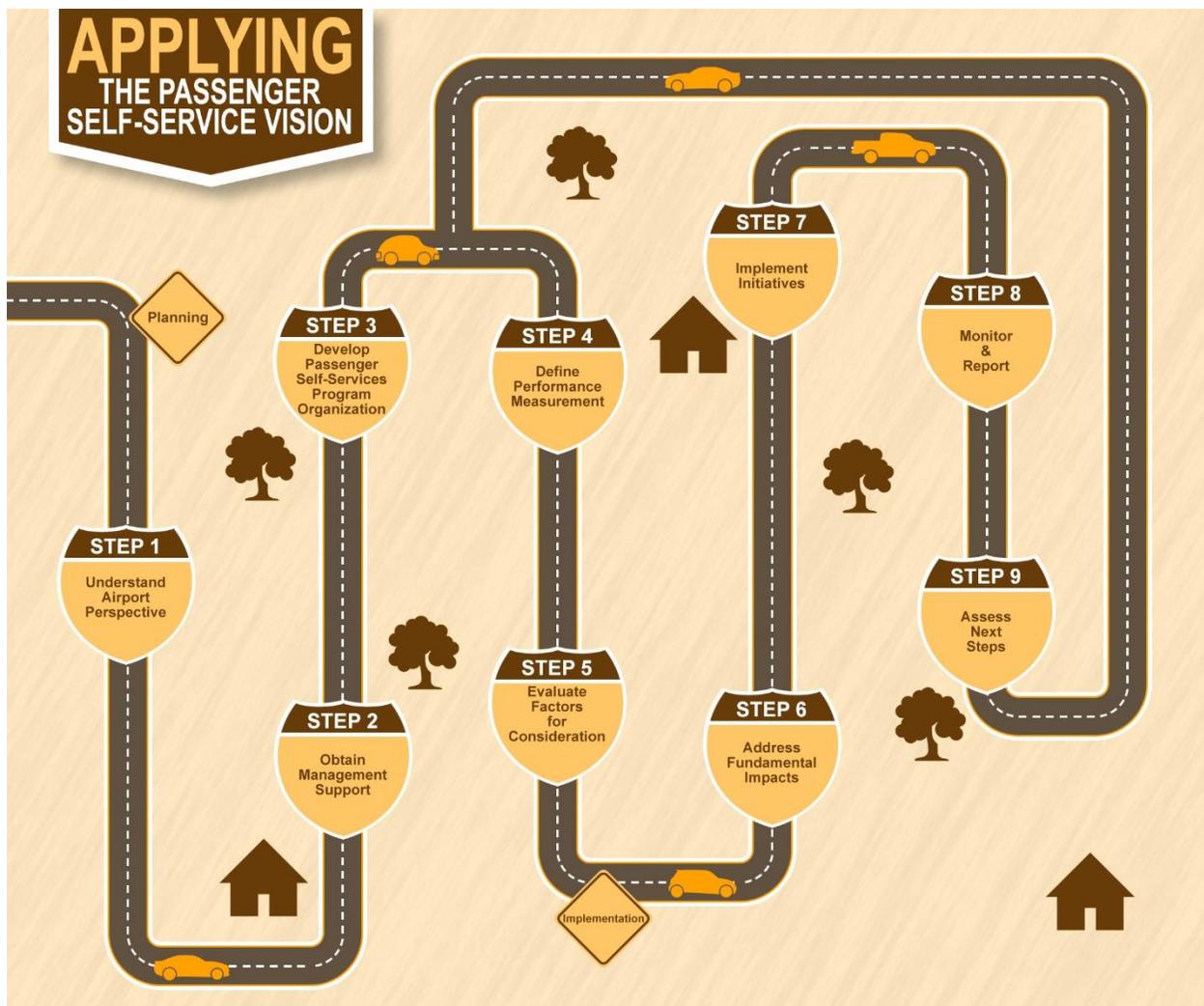
- *Reference / Knowledge* – User is interested in learning about self-service at Airports. The primary objective is to gain knowledge and understanding of the industry as a whole as well as the various self-service applications and technologies. To meet the need of this user, the Guidebook functions as a research and educational tool. The Reference Guide section, the Passenger Self-Service Inventory, the PSS Environment Map, and the Appendices will all be of significant value.
- *Program Planning* – User is familiar with passenger self-service and wants to know what it takes to develop an overall Passenger Self-Service Program. The primary objective is to gain insight into

how to develop a long-term integrated self-service strategy. The Reference Guide section, the Business Case Development Guide, and the PSS Environment Map, will be of primary interest.

- *Project Implementation* – User is ready to engage in a self-service initiative, but is not exactly sure what all must be addressed. The primary objective is to get direction on what must be considered to maximize the value of an overall self-service strategy. Self-service is looked at from a holistic perspective with a strong focus on integration aspects. The Reference Guide section, the Passenger Self-Service Inventory, and the Enabling Technologies Appendix will be most useful.

## Guidebook

The PSS Applying the Vision Roadmap (Roadmap), as shown below, depicts the progression, from beginning to end, of the process of planning and implementing an integrated passenger self-service strategy. It provides the framework for the content included in this Guidebook. Steps 1 – 5 are discussed in Chapter 2, and Steps 6 – 9 are discussed in Chapter 3.



### **Step 1: Understand Airport Perspective**

Every airport owner has a unique perspective through which its PSS strategy should be designed. These perspectives are shaped by things such as business drivers, airline operating models, passenger profiles, and industry involvement. Defining the perspective for a specific airport will lay the foundation for making a valid case to obtain the required level of management support.

### **Step 2: Obtain Management Support**

Executive Management Support for a PSS strategy is absolutely critical for the long-term viability of a successful program. Operations, Planning, and Information Technology all play a fundamental role in the planning and implementation of PSS initiatives and all must have active executive support from the beginning for the airport-wide process changes to be accepted.

### **Step 3: Develop Passenger Self-Services Program Organization**

A formal Organization is needed to plan and govern an integrated PSS program. This Organization serves as the center hub for stakeholder engagement and performs and/or oversees the planning, implementation, and review for Passenger Self-Services airport-wide to insure a consistent approach toward achieving PSS objectives that are fully aligned with the airport business objectives.

### **Step 4: Define Performance Measurement**

Without a means to measure performance, PSS initiatives and the program as a whole may function effectively for years without ever producing the required outcomes necessary to achieve their objectives. In order to judge success or failure in order to make necessary adjustments, key performance indicators must be developed, monitored and reported.

### **Step 5: Evaluate Factors for Consideration**

Several key factors play a pivotal role in the design of PSS initiatives that, if not adequately considered, can result in failure. Stakeholder consensus, regulatory and legal issues, and privacy concerns are a few. It is also imperative to evaluate the likelihood of achieving the expected benefits and of experiencing potential risks.

### **Step 6: Address Fundamental Impacts**

There are a number of fundamental impacts within the airport environment that must be understood and addressed to support a successful implementation. These include the management of data, provision of connectivity, use of enabling technologies, changes to the facility, human resources, and communications with passengers. A proactive approach to addressing these items from a high-level strategy will greatly increase the probability of success.

### **Step 7: Implement Initiatives**

A well-conceived and thoroughly justified program can quickly lose support as a result of a single poorly implemented initiative. After the significant investment of resource time in strategy development and program planning, project implementation is not the time to start cutting corners. Each project must adhere

to a structured implementation process that applies the appropriate depth of planning for the size and scope of the project.

### **Step 8: Monitor & Report**

Monitoring and reporting the defined performance criteria for each and every initiative is necessary to ensure that either adjustments can be made that further the progress toward achieving the stated objectives, or that initiatives can be halted before further resources are wasted. This is a critical component of the quality management process.

### **Step 9: Assess Next Steps**

As PSS projects are closed out and transitioned to steady-state operations, the focus cycles back to the planning stage where data is analyzed, objectives are tweaked, KPIs are adjusted, and corrective actions are taken. Each and every component of the integrated PSS program will continually evolve under Stage 4 as fundamental impacts change, new factors for consideration emerge, and perspectives evolve.

## **Business Case Development Guide**

### **Purpose**

The primary intent of this Business Case Development Guide is to enable the airport operator to make wise decisions that will achieve strategic objectives and further its passenger self-service vision through each initiative. The Business Case Development Guide will be used to facilitate a key step within the Decision Making Roadmap. It will enable an end-user to assess individual issues and evaluate options for implementation. It is comprised of a structured set of templates that guide the user through a step-by-step process of defining appropriate passenger self-service options based on a strategic evaluation of the alignment with their unique Vision, Perspective, and Objectives. The tool guides the user in seeking out the relevant data needed to create a business case document that will define appropriate options with potential benefits and risks, the and likely stakeholder impacts. This tool does not define the final strategy or solution for the user, however, it provide a framework for decision making that ties passenger self-service related decisions to the Airport's Vision while maintaining a focus on creating optimal value.

- The Business Case Development Guide will walk the user through a step-by-step process to:
  - Define the Airport's PSS Objectives relative to the Airport's Mission, Vision, and Objectives
  - Determine the applicability of differing options based on the unique Perspective and Stakeholder Needs of the subject airport
  - Evaluate the value that differing options provide in meeting the Objectives of the Airport
  - Assess the readiness level of the airport and airlines to implement the chosen option based on defined impacts and funding mechanisms.

### **How to Use**

The Business Case Development Guide is a Microsoft Excel document that consists of three worksheets: Strategy Definition, Issue Analysis, and Opportunity Evaluation. The worksheets combine to create a basic business case document that can be used to document the data used in the decision making process for a

new initiative. The value of the overall business case is directly tied to the accuracy and completeness of the information that is put into this form.

## **PSS Environment Map**

### **Purpose**

The purpose of the PSS Environment Map (Map) is to provide the reader with a graphical interactive way of exploring the Passenger Self-Service Environment in which a passenger/traveler functions. The airport has significant opportunity to provide information and options that may influence the passenger's decision on where and how individual travel steps are, or can be, accomplished. Information included is pulled and summarized from various sections of the Guidebook, especially the PSS Inventory, and covers:

- PSS Inventory Items by Location
- Enabling Technologies
- Programs & Services
- Web / Mobile Applications

### **Features & Functionalities**

The PSS Environment Map offers a variety of features and functionalities, including:

- Overview of what to expect & instructions on how to navigate through the material
- Non-linear exploration so user can “zoom” into specific content of interest anywhere on the Map
- Layered content detail so user can determine depth of content by “drilling down” into desired details
- Summary analysis results for all PSS Inventory items covering all evaluation criteria
- Cross-references to Guidebook sections for full text discussions and analyses.
- Introduction to the other tools (*Business Case Development*) and how they relate to and work in conjunction with the Map
- Links to download the published Guidebook and supplemental material as well as to access ACRP-related information.

### **How to Use the Map**

Navigating the PSS Environment Map is very intuitive and only requires a few simple guidelines.

The first few screens are linear, as they guide the user through the introductory material while at the same time provide instruction on how to best navigate through the Map. Once on the main screen, the user can freely explore any area of interest.

By clicking on hotspots, such as “Landside”, the Map will “zoom in” to show information in full screen; generally additional content is available by clicking on newly revealed hotspots to zoom into more and more details, as desired. Clicking close to the screen borders leads to “zooming out” to the previous screen.

# GUIDEBOOK DISSEMINATION

When discussing the most effective methods on getting the research results disseminated throughout the industry and into the hands of the target audience, the Team proposes the following products to be used:

- The complete Guidebook
  - Executive Summary
  - Reference Guide
  - Tools
  - Appendices
- Complete Set of all 3 tools on CD-ROM
  - Business Case Development Guide
  - Passenger Self-Service Inventory
  - PSS Environment Map

In accordance with the dissemination efforts of the ACRP, and in order to reach the target audience most effectively, the Team recommends the following methods:

## I. Dissemination Preparedness

- a. CD or jump-drives prepared with Guidebook, Business Case Development Guide, Passenger Self-Service Inventory, and PSS Environment Map
- c. ACRP Dissemination Team with support from ACRP prepares draft template for use with Impact on Practices
- d. Solicit the opportunities for involvement of individuals:
  - i. With the ACRP Speakers Bureau for the purpose of giving presentations at conferences, etc.
  - ii. As ACRP Ambassadors for the purpose of reaching out and providing ACRP information directly to industry peers/leaders.
  - iii. As ACRP Champions for disseminating ACRP information within their respective organizations
- b. Training of these different groups of individuals on Guidebook content, tools, and presentation.
- c. Create a Passenger Self-Service group on Facebook and/or other social media sites for (also identify who will maintain this group):
  - i. information sharing among and between the airport, airline, aviation associations, concessionaires, and vendors
  - ii. latest trends in the industries related to the topic
- d. Prepare Airport and Airline Contact Mailing List

## II. Early Touch with Aviation Associations that have an active interest in the subject matter:

- a. The following associations / committees have shown an active interest in the subject matter.
  - i. IATA - Passenger Experience Management Group (PEMG)

- i. Fast Travel Program
    - ii. Common Use Working Group
    - iii. Passenger Facilitation Program
  - ii. ACI - Simplifying Passenger Travel Program
  - iii. ACI-NA - Business Information Technology Committee
  - iv. AAAE - Technical Services Committee
- b. Prior to release of the Guidebook, each of the above as well as others should be solicited regarding the following opportunity:
  - i. Provide Copy of PSS Environment Map, and solicit opportunity of posting announcement of Guidebook release on respective Websites
  - ii. Solicit opportunity for members to join established social media forum/group
  - iii. Request names and contacts of other organizations that may have an interest

### III. Upon Release of Guidebook

- a. Send out Mass mailing to Airport and Airline Contact List
  - i. Invite all to visit ACRP Website to download a copy of the Guidebook and CD
  - ii. Invite all to join established social media group
- b. Update each point of contact identified in Item II above, and make sure that their respective websites / social sites are updated
- c. Update ACRP Social Media Group with announced release
- d. Incorporate project into ACRP Event Calendar

### IV. Expand Social Media Passenger Self-Service group

- a. Solicit each Airport Case Study contact presented in Guidebook to join the group and to actively participate in populating the Current Uses / Trends and Lessons Learned portion of the site
  - i. ACRP may wish to volunteer to populate group with information contained in Guidebook as a kick-start.
- b. Solicit opportunity for “first Impacts on Practices” site (see I.b. above)

### V. Conference Presentation

- a. Should follow up with committee points of contacts from Item II above for opportunity to present at regional or annual conferences
- b. Solicit for Impacts on Practices
- c. Advertise social media group
- d. Hand out various material, including the Guidebook and the Complete Tool Set on CD-ROM

### VI. Information Outlets

- a. Prepare Webinar as a Guidebook presentation and workshop
  - i. Webinar should walk through samples of tools in guidebook
  - ii. Webinar should preview the PSS Environment Map
  - iii. Webinar should advertise benefit of social media group
  - iv. Webinar should solicit for “first” Impacts on Practices site
  - v. Committees identified in item II above should be requested to co-sponsor Webinar
  - vi. Make presentation available for post Webinar viewing/download
- b. Request from each Research Team companies (including the Research Team Members) to:
  - Announce the publication of the Guidebook via any or all of the following:

- News Release
  - Website notification/newsletter with link to ACRP Project webpage
  - Tweets and LinkedIn with link to ACRP Project webpage.
- c. Develop Impacts on Practices
- d. Develop Journal Articles
- e. Develop EVideos

# FURTHER RESEARCH OPPORTUNITIES

As a result of the current research that the team conducted on implementing integrated self-service at airports, a significant future research opportunity was identified. In many technology-centric research efforts, the value of the guidance is often limited due to the evolutionary nature of the subject matter. In this particular research project, the Research Team focused on process to ideally enable the base guidance to be less impacted by the changes in technology. However, the underlying concepts are closely tied to the enabling technologies that are in place during the time of the research. The primary issue addressed by this research is something that will be a constant in the future, which is, how the airport ensures an integrated approach to meeting the passengers' needs. As such, there will inevitably be a point at which the base guidance will need a significant update.

# ANNOTATED BIBLIOGRAPHY & RESOURCE GUIDE

## AVIATION INDUSTRY RESOURCES:

- TRB-ACRP [Transportation Research Board – Airport Cooperative Research Program] - <http://www.trb.org/ACRP/ACRP.aspx>  
The Transportation Research Board promotes innovation and progress in transportation through research. The Airport Cooperative Research Program is an industry-driven, applied research program that develops near-term, practical solutions to problems faced by airport operators. ACRP is managed by the Transportation Research Board (TRB) of the National Academies and sponsored by the Federal Aviation Administration (FAA). The research is conducted by contractors who are selected on the basis of competitive proposals.
  
- IATA [International Air Transport Association] – [www.iata.org](http://www.iata.org)  
The International Air Transport Association is a trade association of the world’s airlines. IATA supports airline activity and helps formulate industry policy and standards. They are responsible for the Common Use Self-Service (CUSS) Standard as well as the Fast Travel Program that push airports to better their efficiency and passenger satisfaction through implementation in six areas of passenger self-service.
  - PFWG (Passenger Facilitation Working Group) – The Passenger Facilitation brings together airlines, airports and governments to see how processes can be linked across stakeholder environments, with a focus on the crucial areas of Security, Border Protection, Immigration and Customs that results in an “end-to-end passenger experience that is secure, seamless and efficient”.
  - PEMG (Passenger Experience Management Group) – IATA’s Passenger Experience program addresses the end to end passenger journey from ticket purchase through to arrival at destination. It comprises a range of projects to improve the travel experience and help reduce unnecessary operational costs to the industry. One of the primary delivery channels is self-service options for passengers where it makes sense. In process areas controlled by government authorities, such as Security, Immigration and Customs, Passenger Experience will improve the facilitation of these processes by harmonizing passenger data requirements and enhancing passenger preparedness to reduce queues and process times.
  - CUWG (Common Use Working Group) – IATA develops and maintains common use standards including recommended practices through the work of the CUWG that is part of the IATA Passenger Experience Management Group (PEMG). The standards cover the following three specific areas: Common Use Self Service (CUSS), Common Use Passenger Processing Systems (CUPPS), and standardized data exchange through the use of web service technology.

- ACI [Airports Council International] – [www.aci.aero](http://www.aci.aero), [www.airportservicequality.com](http://www.airportservicequality.com)  
The Airports Council International promotes excellence in airport management and operations and advances the interests of the airports and communities they serve. They developed the ASQ (Airport Service Quality) benchmarking system to improve airport standards and the quality of service to passengers currently in use by 280 airports worldwide.
  - ACI-NA BIT (ACI – North America Business Information Technology) – The Business Information Technologies Committee is the forum where members with airport-related information technology responsibilities can network, communicate, share data, conduct research and keep up-to-date with the latest technological developments. The committee examines new and emerging technologies for their applicability to airport systems, and reviews how existing systems can be improved to better serve the airport system and passenger needs.
  - ACRIS (Airport Community Recommended Information Services) – A project currently underway by the ACI-NA BIT which will provide a service oriented architecture that will allow airports, airlines, and service providers to better communicate. In laymen’s terms, it will help airports and airlines in real time, pass important flight operations data including block times, etc.
- A4A [Airlines for America] [www.airlines.org](http://www.airlines.org)
  - Airlines for America advocates on behalf of the American airline industry as a model of safety, customer service and environmental responsibility and as the indispensable network that drives our nation’s economy and global competitiveness. The association works with the FAA (Federal Aviation Administration) to promote new policies beneficial to the economy, environment, and consistently monitors future technologies which may improve passenger experience in American airports.
- Federal Aviation Administration (FAA) [www.faa.gov/airports](http://www.faa.gov/airports)  
The Federal Aviation Administration is the national aviation authority of the United States. An agency of the United States Department of Transportation, it has authority to regulate and oversee all aspects of American civil aviation. They set various construction, engineering and design standards for American airports.
- International Civil Aviation Organization (ICAO) [www.icao.int](http://www.icao.int)  
The International Civil Aviation Organization (ICAO) is a specialized agency of the United Nations. It codifies the principles and techniques of international air navigation and fosters the planning and development of international air transport to ensure safe and orderly growth. The ICAO Council adopts standards and recommended practices concerning air navigation, its infrastructure, flight inspection, prevention of unlawful interference, and facilitation of border-crossing procedures for international civil aviation.
- The Airport Association for Benchmarking (TAAB) [www.taab.org](http://www.taab.org)  
The Benchmarking Network, Inc. (TBN) is an organization of experienced Benchmarking specialists solely dedicated to using Benchmarking to develop value-based performance improvement opportunities for corporations worldwide. They utilize proven processes and systems to streamline their efforts to achieve high impact results on a timely basis. They

utilize their network of over 140,000 domestic and international contacts to provide the basis for successful global Benchmarking solutions.

- Airport Operators Association (AOA) [www.aoa.org.uk](http://www.aoa.org.uk)  
The Airport Operators Association (AOA) is the national voice of UK airports. They are a trade association representing the interests of UK airports, and the principal such body engaging with the UK government and regulatory authorities on airport matters. Working on behalf of these members, the AOA's mission is to influence governments, regulators and opinion formers at national and international level, in order to secure the policy outcomes that will deliver its vision.
- Transportation Security Administration (TSA) [www.tsa.gov/stakeholders](http://www.tsa.gov/stakeholders)  
The Transportation Security Administration was created to strengthen the security of the United States' transportation systems and ensure the freedom of movement for people and commerce. TSA uses a risk-based strategy and works closely with transportation, law enforcement and intelligence communities to set the standard for excellence in transportation security. The Department of Homeland Security (DHS) of the United States provides security grants to mass transit and passenger rail systems.

### **WEB RESOURCES:**

- Airport Technology [www.airport-technology.com](http://www.airport-technology.com)  
Airport Technology follows the latest trends and innovations in airports specifically and the vendors that produce technology that can improve passenger experience. Employs a team of journalists that objectively cover rules, regulations, construction projects, and groundbreaking deployment of new solutions to help airports make the right decision about what choices to make. Some of the tools and resources available include:
  - Free White Papers
  - Press Releases
  - Lists of Current Vendors by Technology Type
  - Comprehensive Coverage of Industry Innovation
- Future Travel Experience [www.futuretravelexperience.com](http://www.futuretravelexperience.com)  
Future Travel Experience was first developed as response to interest in Common Use Check-In (CUSS) kiosks in airports, but as technology quickly progressed expanded to cover the entire passenger experience throughout the airport and how technology is increasingly developing to help improve air travel. Some of the tools and resources available include:
  - Information on Three Annual Conventions (Global, Asia and Europe)
  - Daily Updates on New Technologies Implemented in Airports
  - Insight to Airline Deployment of Technologies
  - An Object View of Ways to Improve the Passenger Experience

- EyeforTravel [www.eyefortravel.com](http://www.eyefortravel.com)  
 EyeforTravel is a community where the world's top online travel brands – from hotels to airlines, online travel agents, cruise, car hire firms and more – come to meet to drive forward growth and innovation in the industry. They publish many free articles that follow airline and airport trends in adoption and deployment of new technologies and best practices that can improve the passenger airport journey. Some of the tools and resources available include:
  - Industry Analysis and Insights
  - Webinars and Research
  - Conferences
  
- Airline Trends [www.airlinetrends.com](http://www.airlinetrends.com)  
 Airline Trends is an independent industry and consumer trends research agency. We are continuously monitoring the global aviation industry for commercial innovations launched by airlines in response to industry trends and changing consumer behavior. They consistently cover the latest breakthroughs and trends in commercial aviation. Some of the tools and resources available include:
  - Industry Analysis
  - Well-Researched Articles on Innovation
  - Airline Specific Articles
  - Area Specific Articles (Passenger Experience, Mobility, Connected Passengers, Consumer Behavior)
  
- Techopedia [www.techopedia.com](http://www.techopedia.com)  
 Techopedia is a family venture providing insight and inspiration to IT professionals, technology decision-makers and anyone else who is proud to be called a “geek”. Techopedia's goal is to help users better understand technology – and make better decisions as a result. Some of the tools and resources available include:
  - Comprehensive Dictionary of Technical Jargon
  - In-Depth Tutorials
  - Examination of Leading Trends in Articles
  
- Wikipedia [www.wikipedia.org](http://www.wikipedia.org)  
 Wikipedia is written collaboratively by largely anonymous Internet volunteers who write without pay. Anyone with Internet access can write and make changes to Wikipedia articles, except in limited cases where editing is restricted to prevent disruption or vandalism. Users can contribute anonymously, under a pseudonym, or, if they choose to, with their real identity. Some of the tools and resources available include:
  - Research into Past and Present Airport Technologies
  - Information about Passenger Self-Service
  - Detailed Technical Information about Technologies
  - Virtually Every Airport and Airline Globally and Their Objectives

- Information on Passenger Statistics
- Webopedia [www.webopedia.com](http://www.webopedia.com)  
 Webopedia is an online tech dictionary for IT professionals and educators, providing definitions to words, phrases and abbreviations related to computing and information technology. Our goal is to provide easy-to-understand definitions, avoiding the use of heavy jargon when possible so that the site is accessible to users with a wide range of computer knowledge. Definitions are verified among multiple sources; definitions are never based on just one source. Some of the tools and resources available include:
  - Lexicon of Specific Terms
  - Articles on How Emerging Technologies are Used
  - Erudite Studies and Links to Explore Further

**OTHER RESOURCES:**

- Bluetooth Special Interests Group (SIG) [www.bluetooth.org](http://www.bluetooth.org)  
 The Bluetooth Special Interest Group is the body that oversees the development of Bluetooth standards and the licensing of the Bluetooth technologies and trademarks to manufacturers.
- The Payment Card Industry Security Standards Council (PCI SSC) [www.pcisecuritystandards.org](http://www.pcisecuritystandards.org)  
 The Payment Card Industry Security Standards Council is an open global forum for the ongoing development, enhancement, storage, dissemination and implementation of security standards for account data protection. Its mission is to enhance payment account data security by driving education and awareness of PCI Security Standards.
- Transportation Security Administration (TSA) [www.tsa.gov/stakeholders](http://www.tsa.gov/stakeholders)  
 The Transportation Security Administration was created to strengthen the security of the United States' transportation systems and ensure the freedom of movement for people and commerce. TSA uses a risk-based strategy and works closely with transportation, law enforcement and intelligence communities to set the standard for excellence in transportation security. The Department of Homeland Security (DHS) of the United States provides security grants to mass transit and passenger rail systems.



# APPENDICES

## Appendix A: Airport Interview Notes

### Appendix A1: Interview Notes – Denver International Airport

#### Interview Discussion Points

##### A. Self-Service Applications in Place Today

- PreCheck
  - Self Boarding
1. Quantitative and qualitative benefits and costs
    - a. *Benefits: Time Improvements*
  2. Supporting technologies
  3. Supporting policies, procedures, and processes
    - a. *As technology expands into active flight operations, the support model must change to accommodate*
  4. Impacts:
    - a. Commercial
    - b. Planning
    - c. Facilities
    - d. Legal
    - e. Financial
    - f. Risk
    - g. Operations
    - h. Regulatory
    - i. Security
    - j. Technology
  5. Extent of integration with other self-service (passenger and non-passenger) applications and processes
    - a. *Concerned about the integration and is leaning toward keeping things separate on purpose*
    - b. *Standard design for SS-kiosks the airport deploys? Might depend on type of kiosk and its purpose. The look of it should not confuse passenger. Different look for different types of kiosks.*
    - c. *Can a mobile App be used for operational purposes as well as passenger services?*

- d. Debit card dispensing kiosks?*
6. Partnering stakeholders (airlines, concessionaires, vendors, etc.)
  7. Pricing models
    - a. Airlines
    - b. Concessionaires
  8. Lessons learned
    - a. Use a pilot program where there are questionable returns*
    - b. Consider O&D vs. Connecting and business vs family*
    - c. Need to be able to measure impact on the passenger*
      - i. Wait time*
      - ii. Can I get to my gate on time*
    - d. Airport must commit itself to a support model that supports the flight operations related technologies*
- B. Self-Service Applications Planned or Being Investigated for Future Implementation**
1. Types of applications (social media, mobile apps, off-site presence, on-site amenities, etc.)
    - *Lufthansa project will be pilot for an off-airport self tagging / bag-drop solution for hotels and/or transit centers*
    - *Self-tagging & Self Bag Drop: Plans with LH to put in self-service tagging and bag drop (agent assisted) (complete SS operation) pilot for all airlines LH is serving*
    - *CUSS Kiosks: Plans with BA for CUSS kiosks in front of BA counters (not common bag drop)*
      - *Response to airlines' request*
      - *Can help the experience and flow through of passengers*
        - a. Grow capacity without added staff*
        - b. Improve on-time performance*
    - *Interactive Directory*
      - i. 1st of the year*
      - ii. Response to concessionaires' request*
      - iii. Scan boarding pass to enable interactivity (e.g., food/beverage suggestions)*
      - iv. Can SMS directions to their phone*
      - v. Can scan QR code to download map and directions*
      - vi. Includes estimated walking time (considers security queue times)*
  2. Business drivers
  3. Intended outcomes
- C. Airport Strategic Objectives**
1. Airport management culture
    - a. Attitude towards risk

- *Calculated risk*
  - *Mgmt understands benefits but does not want to be the guinea pig*
- b. Decision making process
- *DIA is focused on a) making sure initiatives align with strategic plan, b) projects need to bring out financial returns (direct) of initiative, if not \$ than it needs to show efficiency, time, operation improvements, for example (indirect return)*
2. Airport business drivers
- *Any self-service initiative will need to make clear the financial benefit will be*
  - *Improves check-in, boarding, on-time performance?*
  - *Must show how they meet key metrics tied to the strategic plan*
  - *Argument is that Self-service relieves the airline of having to execute in-person at the airport*
    1. *If you can take the transaction (baggage) and move it away from the terminal, you can relieve the pressure on the airline and the facility (terminal)*
    2. *Argument is not yet winning the battle because “how do you pay for it” is the overriding question*
- a. IT initiatives align with strategic business objectives
- b. Impact of passenger experience (customer satisfaction) on decision making process
- *How much does the passenger experience take into the decision making?*
    1. *Customer experience needs to be able to be measured – surveys will reveal areas of improvements, and how does SS solve the problem: data comparing “with vs. without SS”.*
      - a. *Security wait time*
      - b. *Ability to get to the gate*
    2. *How do you tie project benefit to something you can measure*
      - a. *Average transit time*
      - b. *Passenger complaint reduction*
3. Financial Aspects:
- A. Financial model aspects
1. *Ask if the financial model impacts initiatives for this?*
  2. *How do they pay for the initiatives? Grants, AIP*
  3. *Don’t want to charge airlines more money for a service they are already providing – discuss transfer of costs over time*
  4. *Understanding that costs will go down over time has not necessarily been a decision making argument*
  5. *SS relieves the airline in transacting with passenger - transfer of cost*
  6. *The challenge is when you start to change the model*
- B. Lease agreement model

1. *Airports are moving away from preferred lease and are reverting to month to month or per use agreement – gives airports greater flexibility*
2. *Need to help finance understand that moving to a more flexible model will not hurt their ability to recover costs*
3. *Consider bonds*
4. Airline business approach toward airport partner (e.g., branding)
  - a. *Airline will want to protect branding*
5. Airport business model toward airline partners (e.g., collaboration efforts)
  - a. *Joint airport-airline business meeting monthly to review and approve projects that affect airlines*
  - b. *DIA approaches self-service on their own because there is not an understanding of how to make the argument for transfer of costs*
6. Future considerations (e.g., terminal optimization efforts)
  - a. *Airport taking on capital projects (reclaim of space, etc.) – then you can take on self service type projects*
    1. *Can you then pitch the self service opportunities?*

#### D. Airport Profile

1. Airport size classification
2. Facility/Terminal
  - a. Facility Layout:
    1. *It's a key element for airport to decide on SS initiative. Avoid placement of CUSS kiosks for example not directly next to airline designated counters. Avoid competition with airlines, but support airlines. Needs to be beneficial*
    2. *Enable passenger to avoid unnecessary trips through the airport*
    3. *Independent Research*
3. Airline traffic trends/projections & passenger demographics
  - A. *Passenger Demographics:*
    1. *Making effort to understand how new initiatives affect connecting passengers*
      - a. *Connecting traffic is growing, O&D is below designed expectations*
      - b. *Have not been tracking business vs. family travel, but should be*
  - B. *Traffic Trends:*
    1. *Growing*
      - a. *3% is international - impacts number of kiosks and certain types of SS are more relevant than others*
      - b. *Making case for adding self-service kiosks for LH and BA – allow passenger traffic to grow without impacting existing staff*
    2. *Need to look at CU vs. preferential growth*
4. Aircraft types (size impacts potential self-service benefits)
  - A. *Self boarding gates in relation to aircraft type is a good point of discussion*
    1. *Wide body aircrafts – huge benefit for self boarding gates*

*B. 737 and RJs**1. Look at benefit with JetBlue with smaller aircraft - pilot*

## 5. IT Infrastructure at Airport

## a. Ownership/Management

*DIA owns and manages the network - enables airport to make better decisions regarding SS projects. Network knowledge and control as owner.*

## b. Maintenance/Support Model

*Airport must commit itself to a support model that supports the flight operations related technologies*

*1. DIA IT support has been focused on office apps from 6am – 6pm*

*2. if an airport desires to deploy airport based SS efforts – a change in the support model might be necessary. Existing approach/focus to IT support might have to be modified/shift to accommodate changes that come with SS implementations. IT staff mindset might have to change.*

FINANCIAL PERSPECTIVE

- *Does it improve the customer experience (OIA is 95% O&D and the Board was always very concerned with an enhanced customer service – i.e. Disney travelers that are used to an excellent customer experience)*
- *Will the project extend the life of the terminal – this was very big (and still is) both at OIA and Tampa Int'l. It was on the books to create another “south terminal” at a 1 billion dollar price tag which would have rocketed rates/charges to our airlines. It was a blessing that the project had been delayed and any capital projects that were deemed to expand the life of the existing terminal were generally bought in by the airlines. Anything else was a challenge. Ft. Lauderdale and many other airports have this issue, because they are surrounded 360 by developed land, and have to make their existing terminal more efficient. Jim brought up a great point of offsite baggage check-in keeping bags out of terminal, which reduces wear/tear on terminal carpet, etc.*
- *Financial benefit – which most things relate back too. I think airports (and airlines) will want to know if these proposed self-service strategies CAN be financed through PFC's, Grants, AIP, etc. I think the type of lease/use agreement is not as important but still a good question to ask since residual agreements typically require the airlines to approve all capital projects at the airport, while compensatory agreements give the airport more leeway into spending their own capital funds. In addition, what Jim was talking about, was how the gates/ticket areas, etc. are rented. They are either exclusive – meaning space is assigned only to a particular airline or preferential – where airlines can be shifted based upon demand. For example, if an airport has rented all of their ticket counter/queue on an exclusive basis, it would not make sense for an airport to put in self-service kiosks because it would only benefit a particular airline.*

NOTES:

- *Put passenger survey into the guidebook as a recommendation*
- *What is more important to the airport, airport branding or passenger experience?*
- *Passenger debit card mechanism for handling vouchers*
- *Independent Research:*
  - *Facility Layout*
  - *Airport Size Classifications*
  - *Aircraft Types*
- *For roadmap: Who owns each step/process of the passenger journey and how they could come together*

Documents Received:

- *Flow Passenger Experience (Visio Graphic)*
- *Passenger Processes and Owners (Excel Spreadsheet)*

## Appendix A2: Interview Notes – London Heathrow Airport

### Interview Discussion Points

- A. Self-Service Applications in Place Today – for the noted systems:
- *Fast Track immigration services for premium passengers*
  - *Facial recognition scanners to increase security at checkpoints*
  - *Self-Boarding Trial*
  - *Airport loyalty program to buy things in airport with app*
  - *New Terminal 2 opens June 4. Designed with passenger in mind. Streamlining of passenger flow is fundamentally important. Everything (from understanding how long each segment of the passenger journey takes and where the passenger will end up), is modeled.*
  - *Subway*
    - *Train shuttling between the two buildings*
  - *Way finding designed to be as intuitively as possible*
    - *Mix of static (black on yellow) or dynamic flight information; not much signage in T2 that has to flex based on passenger flow. T5 has some of this.*
  - *Queue wait time measurement*
    - *We measure all of our security queue times*
    - *Stringent SLA's in place. Many targets and service levels are put in place by Civil Aviation Authority of the UK*
  - *Survey collection through various electronic and person means*
    - *Experience passengers tell us*
      - *Press button and how your toilet experience was*
      - *Exiting security search areas*
      - *Courtesy*
      - *Cleanliness*
  - *Heathrow App*
    - *Is focused on the passenger process*
      - *Security*
      - *Amount of time*
    - *No advertising, just everything about the customer*
      - *Making passenger feel like it is all about their service*
      - *Providing new means for commercial benefit*
  - *Impressive website*
    - *Working with airlines to remove airport processing*
      - *Examples – checking in*
        - *Encouraging passengers check in online*
    - *Electronic tool kit offered to airlines for their websites to help their passengers with familiarity with Heathrow*

- *We have staff trying to work with the airlines*
  - *Permanent and home printed bag tags to stream line bag drop*
    - *Working with British Airways*
  - *Printing bag tags on Common Use kiosk*
    - *Traditionally kiosks near their lobbies*
    - *We trialed some in remote areas, but usage was low*
      - *Our retail team takes care of the parking issues*
  - *Location based technologies*
    - *Preference at the moment to use Wi-fi to locate people between transition points – triangulating on people*
      - *We are hoping to understand passenger behavior/flow throughout*
      - *We are looking at opt-in program via website/app for commercial/retail opportunities (next few years)*
  - *Wi-Fi*
    - *Moved from a non-free Wi-fi to free Wi-fi*
      - *First 60 minutes are free*
      - *If a passenger joins as a member of Heathrow (opt-in program) they receive up to 90 minutes free*
  - *Premium Service Bath and Showers (paid)*
  - *Passenger ambassadors*
    - *Support passenger in wayfinding needs*
      - *Even act as personal shopping services*
    - *All have hand-held devices (depends what type based on where they are)*
    - *Connections areas where there are more passenger processing, then they have I-Pad*
    - *Passenger Experience, using Heathrow*
      - *Instant feedback and tools*
      - *Electronic surveys*
    - *We also have Heathrow staff / interviewers*
1. Quantitative and qualitative benefits and costs
  2. Supporting technologies
  3. Supporting policies, procedures, and processes
    - a. *Example –within the last 12 months, we have automated the boarding pass checks (use to have a security officer behind the desk) – we have now automated that with gates. As such, we have updated all of our procedures for boarding across from security.*
    - b. *In putting in any of these initiatives, we will do a thorough review of the std policy / procedures.*
    - c. *As a PM, I don't own that, we then work with our Operations peers to help identify that*
  4. Impacts:

- a. Commercial
- b. Planning
  - *All of our initiatives are related back to how to improve the passenger experience at Heathrow and how will this benefit our airlines*
- c. Facilities
  - *We have taken a conscience effort in reducing the Number of level changes, primarily for the departing passenger. In many cases all on one level, with just the need to drop down to boarding gate*
    - a. *Need to minimize these changes*
    - b. *For T2A stand – come into the building – enter on top floor – security check on same floor – departure lounge on same floor – baggage reclaim and immigration on same level*
      - i. *Most retail on another level*
  - *We are moving towards Terminal 2, a common check-in environment*
    - a. *We would allocate a number of airlines (5 or so)*
  - *We have upgraded our family lounges and play areas*
    - a. *As well as lounges provided by our airlines*
    - b. *Also premium lounges – paid*
- d. Legal
- e. Financial
  - *The challenge is to always reduce operating costs that are ever-increasing*
- f. Risk
- g. Operations
- h. Regulatory
  - *Immigration flow – we continue to work closely with the boarder forces in the UK*
    - a. *Forecasting their passenger flow and help them to model the flow through*
    - b. *Sounds basic, but it was not there in the past*
    - c. *We have pass port gates in place for 7 years, but now owned by the boarder force*
  - *The Civil Aviation Authority imposes Stringent service levels for passenger wait times*
    - a. *This requires careful queue wait time measurement*
    - b. *We measure all of our security queue funds*
      - i. *Queue waits*
      - ii. *Stand availability*
      - iii. *Availability of passenger sensitive equipment*
- i. Security
  - *Perennial challenges – speed and efficiency of passenger checkpoints in each of their journey*

- a. *This is where they are most stressed*
      - b. *We are always seeking to improve the efficiency of security search/checks*
      - c. *Passenger numbers are increasing, and security threats are ever-increasing;*
    - j. Technology
      - *All Technology Infrastructure is impacted by these changes*
  - 5. Extent of integration with other self-service (passenger and non-passenger) applications and processes
  - 6. Partnering stakeholders (airlines, concessionaires, vendors, etc.)
    - a. *Spent a lot of time working with our airlines partners*
      - *Such as with IATA – I am the active member*
    - b. *Looking at their initiatives to help prioritize these in our airport*
      - *Some we have high-priority to get them in quickly*
      - *Others we then set up in a trial environment*
        - a. *Ex. SS bag drops*
        - b. *EX. Self-Boarding Gates*
        - c.
  - 7. Pricing models
    - a. Airlines
    - b. Concessionaires
  - 8. Lessons learned
- B. Self-Service Applications Planned or Being Investigated for Future Implementation
- 1. Types of applications (social media, mobile apps, off-site presence, on-site amenities, etc.)
    - a. *Social media – incredibly useful*
      - *Very active on Twitter, Facebook*
      - *Where it comes into its own, there is disruption in information*
        - a. *Such as snow*
        - b. *Those 4 or 5 days a year in these events*
      - *We use it for marketing and educating people*
      - *We actually engage the customers in social conversation*
        - a. *Ex. Out-of-service information; we acted upon it.*
    - b. *Heathrow has implemented a very well thought-out passenger Opt-in program, built around a “rewards” program*
  - 2. Business drivers
    - a. *taking costs down*
    - b. *expediting passenger flow*
  - 3. Intended outcomes
- C. Airport Strategic Objectives

1. Airport management culture
    - a. Attitude towards risk
      - *we clearly want to keep abreast to technologies, but there is a limit*
      - *we are an airport that operates at 98% capacity*
      - *so if we put something in our check-in area and it does not work, this is a problem, because there is always over-demand*
      - *we want to be fast adopters of technology, but we want to understand the reasonable risk and benefit*
        - a. *this means we look carefully at the investments*
        - b. *all initiatives that we plan to invest in the next 5 years, must have a very defined business case*
    - b. Decision making process
      - *All initiatives are looked at in terms how it affects passenger flow/experience and how does it benefit airline partners. Proper Capital funds allocation*
  2. Airport business drivers
    - a. IT initiatives align with strategic business objectives
    - b. Impact of passenger experience (customer satisfaction) on decision making process
  3. Financial Aspects:
    - a. Overall financial situation (indebtedness; healthy)
    - b. Financial Model
      - Recovery of Cost (compensatory, residual, hybrid) vs. Transfer of Cost
      - Cost vs. benefits (for various stakeholders)
      - Funding (internal, external)
      - Impact on decision-making process
    - c. Lease Agreement Model
      - Preferred vs. Per-use or month-to-month
      - Bonds
  4. Airline business approach toward airport partner (e.g., branding)
  5. Airport business model toward airline partners (e.g., collaboration efforts)
    - a. *SLA in place with airlines for wait times*
  6. Future considerations (e.g., terminal optimization efforts)
- D. Airport Profile
1. Airport size classification
    - a. *hub airport with a high amount of connecting passengers*
    - b. *We are Europe's busiest hub airport*
  2. Facility/Terminal
    - a. Lay-out (equipment placement, security lanes configurations, etc)

- b. Capacity for growth
  - *We are at 98% capacity*
- 3. Airline traffic trends/projections & passenger demographics
  - a. Common use vs. preferential use
  - b. O&D vs. Connecting
  - c. International vs. domestic travel trends
  - d. Business vs. leisure (family)
- 4. Aircraft types (size impacts potential self-service benefits)
- 5. IT Infrastructure at Airport
  - a. Ownership/Management
  - b. Maintenance/Support Model
  - c. Maturity/Scalability
- 6. Regional climate (impact on decision making)

## Appendix A3: Interview Notes – Las Vegas McCarran International

### Interview Discussion Points

#### A. Overall vision for self-service

1. No stated vision other than to enhance operational efficiency and customer service with financial responsibility
2. Within the realm of industry standards without creating unique environment
3. More productive to work collaboratively with stakeholders or other industry participants (want to impact the industry positively)
4. More efficient with use of Common Use originally
  - a. D Gates was in planning stages
  - b. Felt like CU needed to go into place before opening terminal building, then it might not go in at all
  - c. Significant impact on how business is done at the airport (shift use of facilities – enabling operational effectiveness in mergers and alliances)
  - d. Wanted to never have to say no to a new entrant or a request for service expansion
  - e. Benefits
    - Flexibility - Ability to effectively maintain facilities by supporting planned renovations
5. Work with vendors to trial products and provide feedback to the industry
6. Channelization - Fan of providing differing options for passengers to choose what works best for them.
  - a. Empowering customer to do what they wish to do
  - b. Flexibility to support this with the common use as well as distribution of power / data infrastructure
    - Monitors can move around
    - Infrastructure grid in floor
    - Check-in and checkpoint
    - Modular millwork allows for complete reconfiguration
7. Business Arrangements
  - a. Everything available at McCarran is in rates and charges
    - Encourages companies to participate because capital costs are already taken care of
    - Carriers can jump right in
  - b. In third agreement with carriers that addresses nature of common use

#### B. Self-Service Applications in Place Today

1. Dynamic Signage
  - a. Can move and add when and where needed to accommodate changes
  - b. Absolutely required to accommodate full benefit of common use

- c. At gates show images of destination
  - d. Use GIDS to provide additional information in the hold rooms such as rainy screen if it is raining where you are going
2. Self-Service Check-in Kiosks w/ Self-tagging
    - a. AC, WJ, BA doing self-tagging
    - b. Working with 3 domestic carriers to get on in 3-5 months
    - c. Will see common bag drop coming as soon as the agencies learn to deal with the document check (use kiosks and facial recognition)
  3. Curbside Check-in Stations
  4. Off-site Check-in Locations (hotels, casinos, car rental facilities, convention centers)
    - a. Off-site bag check in 90's with company that went defunct
    - b. Now doing it with a company that acts as a certified agent of air carrier (authorized by TSA)
      - SLA with airlines
      - How it is delivered to airline is depending on their individual agreements
      - 100% RFID
  5. Self Boarding Gates
    - a. Slower adoption and bigger learning curve
    - b. Implemented based on feedback from Lufthansa and Continental (United has picked it up)
    - c. Larger design process (best if designed as part of a new building)
      - Where do the agents stand?
      - How do they interact with customer?
      - How do they still reach their computer?
      - How do physically challenged or large families deal with it?
      - Designed whole boarding area to accommodate different modes based on each carriers plans
      - Air carriers use LAS as a test bed

## Appendix A4: Interview Notes – Miami International Airport

### Interview Discussion Points

#### A. Self-Service Applications in Place Today – for the noted systems:

- *CUSS Kiosks*
  - *Pay-on-foot*
  - *They increased food and beverage offerings/restaurants*
  - *MIA just completed their first launch of automated CBP:*
    - *It was popular - they saw 700-800 users.*
    - *The CBP network runs the airport infrastructure*
    - *Currently, it is mainly data moving across the network*
- 

1. Quantitative and qualitative benefits and costs
2. Supporting technologies
3. Supporting policies, procedures, and processes
4. Impacts:
  - a. Commercial
  - b. Planning
  - c. Facilities
    - *Power availability and distribution must be looked at for future power poles*
    - *Does the architectural footprint possibly restrict certain services, such as providing concessions in baggage area while waiting. There might be limited square footage available to do so. In that case a push notification via the mobile app would be beneficial, as it would allow passengers to eat and/or shop (instead of waiting) until luggage actually arrives.*
  - d. Legal
  - e. Financial
  - f. Risk
  - g. Operations
  - h. Regulatory
  - i. Security – *Kiosks for CBP use, improves staff use efficiencies*
  - j. Technology
5. Extent of integration with other self-service (passenger and non-passenger) applications and processes
  - a. *We are looking at using our CUSS kiosks as multi-use kiosks to include “while you are here” information, such as on art museums, sites, cultural information. This would be a limited deployment at carefully selected locations; strategically placed according to arriving passengers. They are aware of the risks of making a CU kiosk a multi-function kiosk.*

- b. *Website, mobile app, and the “while you are here” concept as part of the ConnectID platform have to be integrated over time*
      - c. *Dynamic Signage and Common Use – we are moving more airlines around to accommodate airport requirements. Moving static signage is problematic and costly.*
    - 6. Partnering stakeholders (airlines, concessionaires, vendors, etc.)
    - 7. Pricing models
      - a. Airlines
      - b. Concessionaires
    - 8. Lessons learned
- B. Self-Service Applications Planned or Being Investigated for Future Implementation
- 1. Types of applications (social media, mobile apps, off-site presence, on-site amenities, etc.)
    - a. Dynamic Signage - *The want to replace the current static signage with dynamic signage (looking at Boston Logan, as an example). They are getting ready to kick-off that effort.*
    - b. Value Added Services through existing Kiosks - *While waiting for luggage MAI wants to provide value added services, such as the multi-function kiosks*
    - c. mobile app. *Looking at DFW and Changi airports for ideas. Consider it important that app is straight forward, easily downloadable, and has good content, for example:*
      - *Flight delays*
      - *Road way traffic*
      - *Updates/Notices that affect normal operations, such as “President is coming tomorrow...”*
    - d. Location-based services *(they are working with a company out of London using Connect ID*
    - e. Premium parking, *possibly a rewards program of some kind.*
    - f. Adding charging stations *and try to leverage with advertising and branding*
  - 2. Business drivers
    - a. *Cost Avoidance - With over 85 carriers (including charters), the cost of moving static signage is not a good approach. They use signage to guide the passenger to the baggage area after arrival, for example.*
    - b. *New customer services*
    - c. *Customer Service / new commercial opportunities*
    - d. *Customer Service / new commercial opportunities*
    - e. *Customer service*
    - f. *Customer service*
  - 3. Intended outcomes
    - a. *Improved customer service / less complaints*

- b. *Added services with little additional costs – improved opportunity of revenue*
- c. *Better understanding of passenger locations and ability of passenger offerings*
- d. *Better understanding of passenger locations and ability of passenger offerings*
- e. *Added services with little additional costs – improved opportunity of revenue*
- f. *Improved customer service / less complaints / improved opportunity of revenue*

### C. Airport Strategic Objectives

1. Airport management culture
  - a. Attitude towards risk
    - *Management is risk averse at times, but realizes that risk can lead to profits, if managed right. Direction is to mitigate risk as much as possible.*
  - b. Decision making process
    - *One means is through the regularly held “Innovations Meetings” at which such initiatives are discussed and analyzed, and recommended. Currently, there is not a formal process in place to rate and evaluate initiatives, but they use the Innovation Meetings for that purpose.*
    - *Use of prototyping, for example:*
      - a. *If they are going to offer premium parking, then that service could be offered to Valet Parking; bag tags could be linked to parking information and related services could be added as well.*
2. Airport business drivers
  - a. *IT initiatives align with strategic business objectives*
  - b. *Customer Service - MIA deploys more self service options to provide additional value to customers. Initiatives are generally airport-wide and strategically placed throughout the facility. The general approach is to build on existing technology and looking at potential strategies to how best to utilize it to provide a value add to passengers*
  - c. *Business Drivers look at requirements for destination based airport (40+ million PAX/year)*
  - d. *Working with the main business partners (airlines and passengers) is very important*
  - e. *How it impacts the Budget is very important:*
    - *Non-aeronautical revenue?*
    - *New Business revenue streams, such as public/private partnerships?*
3. Financial Aspects:
  - a. *Overall financial situation (indebtedness; healthy)*
  - b. *Financial Model*
    - *Recovery of Cost (compensatory, residual, hybrid) vs. Transfer of Cost*
    - *Cost vs. benefits (for various stakeholders)*
    - *Funding (internal, external)*
    - *Impact on decision-making process*

- c. Lease Agreement Model
        - Preferred vs. Per-use or month-to-month
        - Bonds
  - 4. Airline business approach toward airport partner (e.g., branding)
  - 5. Airport business model toward airline partners (e.g., collaboration efforts)
  - 6. What is the community demographic that you serve?
    - a. *Sporting events (professional and collegiate) are important to this Community*
    - b. *Strong connection to Latin and South American markets (such as Brazil that spends large sums on money on this market/community)*
    - c. *They consistently ask themselves, how can we provide more value to the passengers? They are focusing on Kids*
  - 7. Future considerations (e.g., terminal optimization efforts)
- D. Airport Profile
- 1. Airport size classification
  - 2. Facility/Terminal
    - a. Lay-out (equipment placement, security lanes configurations, etc)
    - b. Capacity for growth
  - 3. Airline traffic trends/projections & passenger demographics
    - a. Common use vs. preferential use
    - b. O&D vs. Connecting
    - c. International vs. domestic travel trends
    - d. Business vs. leisure (family)
  - 4. Aircraft types (size impacts potential self-service benefits)
  - 5. IT Infrastructure at Airport
    - a. Ownership/Management
    - b. Maintenance/Support Model
    - c. Maturity/Scalability
      - i. *MIA has no concerns regarding its IT infrastructure – its scalable, which is very important*
      - ii. *Network provisioning design with diverse path with 99.9% availability*
      - iii. *Another \$4million in devices*
      - iv. *Right now, we are running at 20 to 25% capacity*
      - v. *Secondary network for CCTV and video*
  - 6. Regional climate (impact on decision making)
- Absolutely – the local climate and market (see C.6. above) drives many of the initiatives and solutions*

## Appendix A5: Interview Notes – Munich Airport

### Interview Discussion Points

- A. Self-Service Applications in Place Today – for the noted systems:
- Premium Parking – including the following:
    - Positions with bigger spaces
    - Passenger valet
      - Car wash / detailing
      - Car inspections
  - InfoGates – These are real-time video conferencing kiosks for passenger inquiries. Located at our service counters, passengers can set up a video conference and can talk directly with an airport ambassador for wayfinding and other questions. Kiosk is a touch screen system.
  - Tablets for Ambassadors - All the information about public transport and hotels, etc, they can also pass information to printers.
  - Airport Website – Includes Traveler Registration option on the Landing Page (full benefit of passenger options is the next time the passenger arrives)
    - Not location based
  - Airport Mobile App - Includes car location finder; shopping, integration with Twitter, Facebook, SMS, and email.
  - Self-Boarding Gates – working with Lufthansa ( FTE Award)
1. Quantitative and qualitative benefits and costs
  2. Supporting technologies
  3. Supporting policies, procedures, and processes
  4. Impacts:
    - a. Commercial
    - b. Planning
    - c. Facilities
    - d. Legal
    - e. Financial
    - f. Risk
    - g. Operations
    - h. Regulatory
    - i. Security
    - j. Technology
  5. Extent of integration with other self-service (passenger and non-passenger) applications and processes
  6. Partnering stakeholders (airlines, concessionaires, vendors, etc.)
  7. Pricing models
    - a. Airlines

- b. Concessionaires
- 8. Lessons learned

B. Self-Service Applications Planned or Being Investigated for Future Implementation

- o *We are building our passenger “opt-in” program where the passenger registers from the front page of the Airport Web Page. If the passenger accepts our terms and provides information such as passenger name, email, flight number, then we can use the passenger information. At present, we are working on premium services, such as:*

- 1. Types of applications (social media, mobile apps, off-site presence, on-site amenities, etc.)
  - a. Airport Website and Mobile App. *We have not yet looked at pushing this to our off-site website or through social media.*

b. *On-site amenities include:*

- Premium and Pre-book Car Parking - *This is a pilot project with Amadeus, where if the passenger from the reservation system, types in his/her flight number, then the system communicates with our system at the airport to obtain the best possible car park. Location is based on the navigation system. What we are doing now is trying to define the difference between our interface and the other manufacturers*
- Free Wi-Fi

- 2. Business drivers

a. *Primarily driven by commercial opportunities with the passengers*

- 3. Intended outcomes

a. *Better understanding of passenger demographics*

b. *Improved financial benefit to the airport*

- Passenger location database *through scanning of boarding pass at various locations throughout the airport. Through this program, we want to do more commercial marketing that we can push directly to the passenger, such as:*

- 1. Types of applications (social media, mobile apps, off-site presence, on-site amenities, etc.)

a. *Boarding pass scanners and location database*

b. *On-site amenities include:*

- Special Discounts to our customers - *It starts in car park areas – special marketing event – scan the boarding pass and get xx% off. We want to scan the boarding pass next to the security area and various shops*

- 2. Business drivers

a. *Passenger Location information – Airport Facility Efficiency Improvements*

b. *Commercial opportunities with the passengers*

- 3. Intended outcomes

- a. *Better understanding of passenger locations – sharing of information with airlines*
- b. *Improved financial benefit to the airport*

C. Airport Strategic Objectives

1. Airport management culture
  - a. Attitude towards risk
    - *This is an on-going discussion with Business Units and Management. We are setting up direct sale channels to the passengers that then provide multiple opportunities for very tailored services, potentially benefiting all business units. However, this discussion is difficult, because the business units have yet to understand the benefits, thereby not yet fully accepting the risks*
  - b. Decision making process
    - *We have started a strategic initiative for seamless travel – members from all business units (aviation, security) – internal team members to help with understanding, benefit, and opportunity*
2. Airport business drivers
  - a. IT initiatives align with strategic business objectives
  - b. Impact of passenger experience (customer satisfaction) on decision making process
    - *We are attempting to address our O&D and Transfer passenger traffic*
3. Financial Aspects:
  - a. Overall financial situation (indebtedness; healthy)
  - b. Financial Model
    - Recovery of Cost (compensatory, residual, hybrid) vs. Transfer of Cost
    - Cost vs. benefits (for various stakeholders)
    - Funding (internal, external)
    - Impact on decision-making process
  - c. Lease Agreement Model
    - Preferred vs. Per-use or month-to-month
    - Bonds
4. Airline business approach toward airport partner (e.g., branding)
5. Airport business model toward airline partners (e.g., collaboration efforts)
  - a. *Through our passenger ‘opt-in’ program, we are sharing passenger location information with the airline, so that they can make better informed decisions on departure. For example, if our information has the passenger not even arrived at the airport yet, or perhaps still on the non-secure side of the airport, the airline they airline may decide to close the gate and even remove passenger baggage. Then work directly with the passenger on rebooking. We are working with Lufthansa in the early stages.*

## 6. Future considerations (e.g., terminal optimization efforts)

D. Airport Profile

1. Airport size classification
2. Facility/Terminal
  - a. Lay-out (equipment placement, security lanes configurations, etc)
  - b. Capacity for growth
3. Airline traffic trends/projections & passenger demographics
  - a. Common use vs. preferential use
  - b. O&D vs. Connecting
    - *Terminal 1 O&D*
    - *Terminal 2 Large - Transfer passengers*
  - c. International vs. domestic travel trends
  - d. Business vs. leisure (family)
4. Aircraft types (size impacts potential self-service benefits)
5. IT Infrastructure at Airport
  - a. Ownership/Management
  - b. Maintenance/Support Model
  - c. Maturity/Scalability
6. Regional climate (impact on decision making)

## Appendix A6: Interview Notes – Montreal-Trudeau

### Interview Discussion Points

#### A. Self-Service Applications in Place Today – for the noted systems:

<List Applications>

- *Self-service check-in*
- *Common use bag drop - will be the first to have unassisted CU Bag Drop (in Transborder area)*
- *Automated Passport Control (Vancouver solution)*
- 
- *Main focus is to start with a list of menu for the passenger as they approach. Certain tools include:*
  - *As the Passengers arrive, we use our Web site heavily*
    - *Offer various services such flight information and alerts using SMS – passengers punch in the flight number, type in if they want an alert for time*
    - *Another option – Secure Express – being able through the web to enter flight # and register for a secure time to “fast track” security (like Disney). This helps to flatten the peaks.*
    - *We added 2 months ago – parking reservations with fee in advance – regular price to those who show up and offer specialty pricing for advanced. Different services*
    - *Weather, roads, traffic information – all in the planning*
    - *Mobile web site – up to date*
    - *Responsive design – (being built – launch in March) website adapts to the specific hardware being used and according to where the passenger is logging on. – using wireless and other location based services*
    - *Part of the upgraded website, offering the passenger certain tools depending on travel and the passenger’s profile. We are offering a preferred reward program.*
  - *For off-site check-in. our vision is that the on-site check in process is disappearing. All checked-in. Home printed bag tags – temporary. Permanent (RFID) is where things are going. – not outside of airport bag drop at this time. We did some are cruise boats and we have a project for a direct shuttle – when that opens in a couple of years, we will want it there. We are looking at places in parking lots and trial downtown.*
  - *We have common use SS bag drops in the Transport terminal – we started pilot with Westjet. 2-step process. We just deployed all the bag drops self service. We hope to replicate in domestic and international*
  - *For landside dwell – we have tons of data on wait times, etc. so we are providing the passenger the process times on the web / mobile and displayed on-site. Same thing for customs – same thing at baggage delivery and Canadian customs. For integration – as part of our common use kiosks – as you finish check-in, you have an option for a map to your gate and get the process time and QR code for getting it on your mobile.*

- *Dual location through WiFi – something in the future and to integrate that as well, using the mobile as GPS – opt-in type of approach with marketing coupons. – not there yet.*
- *Not really done much with equipping airport ambassadors. – we know some are doing it. So we are in the process of questioning ourselves as to what are the best ways. Mobile tools seem to make best sense, but we don't want to duplicate the airline's work.*
- *Security is managed by CATSA, which are fairly pro-active. We have several queuing options: Nexus members have a fastrack, and looking as a self-service access for Nexus; family queuing, those who register on the web; regular queuing. Also looking at "check-point of the future" –*
- *We have always put an emphasis on departures, but we started to look at arrivals. There are very good opportunities to influence government*
- *Re-booking / boarding – working with airlines, yes*
- *Airside dwell time – we still have quite a bit more landside. We have physical limitations to our building on airside. Spa massage, business centers, rest areas – we are looking at that. Looking at passenger opt-in programs – providing specific information to the passenger – is a direction we are going, augmented reality, etc.. – we are not there yet.*
- *Arrivals – traditionally, passengers were arriving, going through customs, getting their baggage and leaving. But working with customs, we started working with automated process. Our line ups reduced from over an hour, to less than 20 minutes and passenger satisfaction went extremely high. We worked with other customs areas. We had looked at the entire process. Wait time at customs (Canadian-US), wait time at baggage carousels; automated gates at the downstream of customs after baggage collection and handing off of card.*
- *Social Media – we are doing it and are doing a few contests. We have about 20k members. YouTube, Facebook,*

1. Quantitative and qualitative benefits and costs
2. Supporting technologies
3. Supporting policies, procedures, and processes
4. Impacts:
  - a. Commercial
  - b. Planning
  - c. Facilities
  - d. Legal
  - e. Financial
  - f. Risk
  - g. Operations
  - h. Regulatory
  - i. Security
  - j. Technology

5. Extent of integration with other self-service (passenger and non-passenger) applications and processes
  6. Partnering stakeholders (airlines, concessionaires, vendors, etc.)
  7. Pricing models
    - a. Airlines
    - b. Concessionaires
  8. Lessons learned
- B. Self-Service Applications Planned or Being Investigated for Future Implementation
1. Types of applications (social media, mobile apps, off-site presence, on-site amenities, etc.)
  2. Business drivers
  3. Intended outcomes
- C. Airport Strategic Objectives
1. Airport management culture
    - a. Attitude towards risk
      - *About 10 years ago, we decide to put innovation in the forefront, which changed our approach. We decided to move to 100% common use and reduce the cost of Cap-x and infrastructure.*
      - *At that time, there was resistance*
      - *Since that time, culture has changed to where if we want to become more effective, then innovation and technology was the only way. – this drove change*
      - *We really focused on certain key technologies and innovations*
        - a. *We did not want to be the innovators in everything*
        - b. *We identified key performance indicators and focused on these*
        - c. *We worked through pilots*
    - b. Decision making process
      - *We created a CUPPS committee for (Common Use Passenger Process Systems) – involved airlines, legislators, handling companies, and the airport*
      - *The goal was to make this as part of Operations*
      - *Different than the AOC (Airline) and ACC (financial)*
      - *Consensus started with common use – it has really become a part of our culture.*
  2. Airport business drivers
    - a. IT initiatives align with strategic business objectives
      - *Offering ease of process*
      - *And commercial opportunities*
      - *We have to maximize non-aeronautical charges*

- b. Impact of passenger experience (customer satisfaction) on decision making process
- 3. Financial Aspects:
  - a. Overall financial situation (indebtedness; healthy)
  - b. Financial Model
    - Recovery of Cost (compensatory, residual, hybrid) vs. Transfer of Cost
    - Cost vs. benefits (for various stakeholders)
    - Funding (internal, external)
    - Impact on decision-making process
  - c. Lease Agreement Model
    - Preferred vs. Per-use or month-to-month
    - Bonds
- 4. Airline business approach toward airport partner (e.g., branding)
- 5. Airport business model toward airline partners (e.g., collaboration efforts)
  - a. *We think there is a big reason for Website hand-off between Airport to Airline website. We wanted one website for all passengers and be accessible for all requests. With the airlines, we want to facilitate links between the airlines. We are hoping that airlines to do the same thing. But there is still more to do on this. Complimentary r*
- 6. Future considerations (e.g., terminal optimization efforts)

#### D. Airport Profile

- 1. Airport size classification
- 2. Facility/Terminal
  - a. Lay-out (equipment placement, security lanes configurations, etc)
  - b. Capacity for growth
- 3. Airline traffic trends/projections & passenger demographics
  - a. Common use vs. preferential use
  - b. O&D vs. Connecting
    - *We are an O&D market*
    - *Connecting passenger is about 14%*
      - a. *The more the connecting market, the more competition between airports*
  - c. International vs. domestic travel trends
  - d. Business vs. leisure (family)
- 4. Aircraft types (size impacts potential self-service benefits)
- 5. IT Infrastructure at Airport
  - a. Ownership/Management
  - b. Maintenance/Support Model
  - c. Maturity/Scalability
- 6. Regional climate (impact on decision making)

## Appendix A7: Interview Notes – Orlando International Airport

### Interview Discussion Points

#### A. Self-Service Applications in Place Today – for the noted systems:

##### I. Customs Border Patrol (CBP) Kiosks

- a. *General: We are prototyping an automated CBP Kiosk hardware solution and application through SITA. CBP Kiosks prototyped by OIA are produced in Portugal by Visionbox. The project is planned in the following phases:*
  - i. *Phase 1 – US*
  - ii. *Phase 2 – Canada*
  - iii. *Phase 3 – VISA Waiver countries*
  - iv. *Phase 4 – Latin America (hopeful at this time)*
1. Quantitative and qualitative benefits and costs
  - a. *The primary benefit is to reduce the congestion within the CBP area. Current conditions can result in incoming airlines parked on the runway for up to 2.5 hours. This condition is extreme, but can happen especially with the VISA Waiver countries, where CBP can experience an influx of 5 to 6 thousand passengers in a very short time span.*
  - b. *Benefit is a direct passenger benefit – increased customer satisfaction/experience*
  - c. *Indirect benefit is reclaim of CBP space*
  - d. *Costs include Kiosk costs (approximately \$40k each) and infrastructure. Training and support costs have to also be included.*
2. Supporting technologies
  - a. *Supporting technologies include the peripherals used and the innovations of the kiosk. For example, the GOAA kiosk uses sensing technology developed for X-Box. This technology identifies the users “eye-level” and automatically vertically adjusts the kiosk frame for proper picture taking.*
  - b. *Other peripherals include the biometrics for finger printing, the printer, pass port reader, touch screen, and up-front dynamic signage*
3. Supporting policies, procedures, and processes
  - a. *No specific policies / procedures at this time*
4. Impacts:
  - a. Commercial
  - b. Planning
    - *The planning process is to reduce the passenger time with the CBP agent. At present, it is assumed that the passenger will spend approximately 30 seconds at the kiosk providing Bio information (finger prints), picture, and pass port information. Then the passenger will spend 30 to 45 seconds answering additional questions from the CBP agent, for a total time of 1*

*to 2 minutes. It is assumed that one agent will be able to process passengers from 5 kiosks (1 to 5 ratio).*

- c. Facilities
    - *CBP expects that as kiosks are installed and passengers begin to use these kiosks, traditional counters can be removed.*
  - d. Legal
  - e. Financial
    - *The GOAA is funding the full costs of the project through discretionary funds.*
  - f. Risk
    - *Risk is for the technology provider, in that its eventual customer base is quite small, primarily covering the 25+ Category X airports. This may increase to Category I as well.*
    - *Passenger adoption rate is yet unknown*
  - g. Operations
  - h. Regulatory
    - *Direct impact to CBP agent counts*
  - i. Security
  - j. Technology
    - *Unsure of technology impact, especially with failure rates.*
5. Extent of integration with other self-service (passenger and non-passenger) applications and processes
    - a. *No integration expected. IT infrastructure is dedicated to this process*
  6. Partnering stakeholders (airlines, concessionaires, vendors, etc.)
    - a. *Primary stakeholder is Customs and Border Patrol*
    - b. *Vendor Stakeholder is SITA and Vision Box (kiosk provider). Other vendors in the market include Vancouver Airport solution (It has been announced that DFW is going with the Vancouver Solution), NCR, IBM (Toronto)*
  7. Pricing models
    - a. *No specific pricing model is needed for the service*
    - b. Airlines
    - c. Concessionaires
  8. Lessons learned
    - a. *No specific lessons learned at this time*

## **II. Common Use**

- a. *General:*
  - i. *We have a push to be 100% Common Use at Air side and Land side. Air side (gates) is first initiative. 100% Land side in future (perhaps over the next 2 years).*
1. Quantitative and qualitative benefits and costs

- a. *As our capacity continues to fill up, common use provides us the greatest flexibility for using our facility.*
  - b. *Provides us the greatest facility flexibility, especially with Airline mergers, and changes in where we can best accommodate the airlines.*
  - c. *Costs are controlled based on expansion and can be looked at on a per location basis.*
2. Supporting technologies
  - a. *IT Infrastructure*
  - b. *CUSS for passenger self service kiosks. We are not fully CUSS at this time. There is some dedicated Kiosk use*
  - c. *CUPPS for Airline agent facing use*
  - d. *Other supporting technologies include Resource Management System, MUFIDS,*
3. Supporting policies, procedures, and processes
  - a. *GOAA maintains an Airline Use Policy and Procedure for Common Use*
4. Impacts:
  - a. Commercial
  - b. Planning
  - c. Facilities
  - d. Legal
  - e. Financial
  - f. Risk
  - g. Operations
  - h. Regulatory
  - i. Security
  - j. Technology
5. Extent of integration with other self-service (passenger and non-passenger) applications and processes
  - a. *Common Use Self Tagging – this is growing – Air Canada is currently slated to be piloted*
  - b.
6. Partnering stakeholders (airlines, concessionaires, vendors, etc.)
  - a. *Airlines*
  - b. *Immediate Vendor is SITA. Other vendors in the market include ARINC and Ultra for CUPPS; AirIT for Shared Services*
7. Pricing models
  - a. Airlines
    - a. *Pricing model is defined per airline use – through a common use fee.*
  - b. Concessionaires
8. Lessons learned

### III. Remote Bag Collection

- a. *General:*
  - i. *We attempt to take advantage of the Remote Bag Collection as much as possible and are continuing to expand such services. GOAA built and manages a Remote Screening Facility (RSF). The RSF is run by Bags, Inc. This facility is currently used by Disney, Rosen hotels, and Virgin. Future use is with the Convention Center and Remote Parking*
1. Quantitative and qualitative benefits and costs
  - a. *Reduced Terminal congestion. We are processing about 20% of our passengers off site, before they arrive at the terminal*
  - b. *Direct Benefit to the passengers, allowing them to off load their bags early and consequently spend more time of the day they are leaving, doing their vacation related activities.*
2. Supporting technologies
  - a. *IT Infrastructure*
  - b. *Bags, Inc. interface to airlines*
3. Supporting policies, procedures, and processes
4. Impacts:
  - a. Commercial
  - b. Planning
  - c. Facilities
    - a. *Choke point areas for us are the roadways and baggage facility. Greater use of the RSF helps in both of these areas*
  - d. Legal
  - e. Financial
  - f. Risk
  - g. Operations
  - h. Regulatory
  - i. Security
  - j. Technology
5. Extent of integration with other self-service (passenger and non-passenger) applications and processes
  - a. *Integrates with baggage processing*
6. Partnering stakeholders (airlines, concessionaires, vendors, etc.)
  - a. *Airlines, theme parks, hotels*
  - b. *Vendors – Bags, Inc.*
7. Pricing models
  - a. Airlines
  - b. Concessionaires
8. Lessons learned

#### IV. Passenger Self Tagging

- a. *General:*
  - i. *Passenger Self Tagging is a new initiative, with Air Canada currently trying it on their dedicated kiosk (in Canada). We are looking at moving this to our common use CUSS kiosks. Delta, AA, Westjet have shown interest.*
1. Quantitative and qualitative benefits and costs
  - a. *Direct benefit of processing passengers more efficiently through the check-in process*
  - b. *Business passengers prefer this model*
  - c. *Indirect benefit to the airlines in more efficient use of their staff*
2. Supporting technologies
  - a. *Supporting technologies mainly are the peripherals*
  - b. *CUSS*
3. Supporting policies, procedures, and processes
  - a. *IATA standards for common use, bag tag printing, peripherals*
  - b. *TSA standards*
4. Impacts:
  - a. Commercial
    - a. *Airline impact on branding issues*
  - b. Planning
  - c. Facilities
    - a. *There is an issue with the airlines regarding their use of the 1-step model (kiosks at the check-in counter) versus the 2-step model (kiosks away from the counter).*
    - b. *For the airport this issue is a matter of properly planning for and managing changes - millwork changes at the counters and core drills away from the counters.*
    - c. *For the airline, how does a common use solution tie in with their dedicated solution and how will the airport impact their process and facility?*
  - d. Legal
  - e. Financial
  - f. Risk
  - g. Operations
    - a. *Does the airport allow or mandate the 1 / 2-step processes? Some airports, such as LAS have mandated, and have thus negatively impacted some of their airline processes. MCO is looking into not having to mandate*
  - h. Regulatory
    - a. *At present, the TSA has put out a procedure. Uncertain how / if this will impact a common use installation.*

- i. Security
  - j. Technology
    - a. *Kiosks need to be prepared for self tagging (primarily for the additional printer and paper stock)*
- 5. Extent of integration with other self-service (passenger and non-passenger) applications and processes
  - a. *CUSS*
  - b. *IT Infrastructure*
- 6. Partnering stakeholders (airlines, concessionaires, vendors, etc.)
  - a. *Airlines*
  - b. *Vendors – SITA, IER, ARINC, others*
- 7. Pricing models
  - a. *Airlines*
  - b. *Concessionaires*
- 8. Lessons learned

#### **V. Passenger Self Boarding**

- a. *General:*
  - 1. *We are looking at implementing these, as driven by Airline needs. At present, we are doing a pilot with JetBlue*
  - 2. Quantitative and qualitative benefits and costs
    - a. *GOAA does not see a direct financial benefit for the airport*
    - b. *Understand there may be boarding benefits for airlines and consequently passengers*
    - c. *Costs to for infrastructure/equipment are approximately \$50 to \$60k per installation.*
  - 3. Supporting technologies
  - 4. Supporting policies, procedures, and processes
  - 5. Impacts:
    - a. Commercial
    - b. Planning
    - c. Facilities
      - a. *We have not fully figured out how to handle the boarding equipment in our common use models. At present, we are handling it on a case by case situation.*
    - d. Legal
    - e. Financial
    - f. Risk
    - g. Operations
      - a. *Use of the self boarding equipment in a non-self boarding operation. Understand the LAS is doing this.*

- h. Regulatory
- i. Security
- j. Technology
- 6. Extent of integration with other self-service (passenger and non-passenger) applications and processes
  - a. *This should be investigated further with the airlines*
- 7. Partnering stakeholders (airlines, concessionaires, vendors, etc.)
  - a. *Airlines, Vendors(?)*
- 8. Pricing models
  - a. Airlines
  - b. Concessionaires
- 9. Lessons learned

## **VI. Free Based Wireless Passenger Service**

- a. *General:*
  - i. *At GOAA we provided free WiFi for our passengers. We attempt to keep up with the needs of our passengers, while also using this same infrastructure for GOAA requirements and the needs of our other tenants.*
- 1. Quantitative and qualitative benefits and costs
  - a. *Primary benefit is providing a free customer service to our passengers*
  - b. *Some revenue benefit through selling service to our airlines and other tenants*
  - c. *Costs primarily associate with continual infrastructure upgrades.*
- 2. Supporting technologies
  - a. *Many supporting technologies for wireless services. For example – location based services (as discussed further in these minutes)*
  - b. *We are looking at potential revenue through WiFi connectivity from cell phones*
- 3. Supporting policies, procedures, and processes
  - a. *Unknown at this time.*
- 4. Impacts:
  - a. Commercial
  - b. Planning
    - a. *Planning must always be future - looking –“ when am I going to run out of bandwidth?”. For free wi-fi, the concern is negative comments from customers regarding slow response time.*
  - c. Facilities
  - d. Legal
  - e. Financial
    - a. *Trends are that bandwidth costs are dropping significantly. Price drop is also due in part to new competition streams*
  - f. Risk

- a. *Free WiFi can produce negative opinion, due to slow response times, if not carefully monitored*
  - b. *Interference issues with the proliferation of devices connecting to the WiFi and through cellular 4-G , and also creating their own “hot-spots”.*
- g. Operations
- h. Regulatory
- i. Security
- j. Technology
  - a. *Maintaining proper amount of Access Points and ensuring that older technologies are phased out. We are pushing to have 1,000 access points installed throughout the airport. This includes at least one per gate area.*
  - b. *Newer AP technology allows 30 to 40 people per access point. Some of our older AP’s have a capacity limit of half that total.*
  - c. *Today, we maintain 2- 500 meg pipes for bandwidth. We are moving to 2 gig pipes supporting GOAA*
- 5. Extent of integration with other self-service (passenger and non-passenger) applications and processes
- 6. Partnering stakeholders (airlines, concessionaires, vendors, etc.)
  - a. *Airlines*
  - b. *GOAA internal staff*
  - c. *Passengers*
- 7. Pricing models
  - a. Airlines
  - b. Concessionaires
- 8. Lessons learned

## **VII. Location Based Services**

- a. *General:*
  - i. *We have installed some location based services, but for the most part, this is still a development project. We are working with SITA and a company that has done this type of work before, and currently are in the process of developing the application. We envision this program to be an “opt-in” type program, where the passenger enrolls, either through a mobile app, or through the Website.*
- 1. Quantitative and qualitative benefits and costs
  - a. *Passenger benefit for being able to offer the passenger added services, based on their location within the airport and time available prior to the flight.*
  - b. *Financial benefit to GOAA in maximizing revenue opportunities from the passengers*
  - c. *Additional benefit of obtaining passenger data for other uses, such as notifying passengers of airport constructions, or even an IROPS event.*

2. Supporting technologies
  - a. *Wireless Infrastructure – take advantage of existing infrastructure*
  - b. *Mobile smart phone and mobile application*
  - c. *website*
3. Supporting policies, procedures, and processes
  - a. *Unknown at this time*
4. Impacts:
  - a. Commercial
    - a. *Defining the commercial opportunities and work with concessionaires in offerings to passengers*
    - b. *Cooperative effort with the concessionaires in increasing the enrollment process*
  - b. Planning
    - a. *GOAA business objectives are to reduce reliance on Airline revenues. Currently, GOAA depends on less than 30% for Airline Revenue. Can this technology help us reduce that percentage even more.*
    - b. *Specific uses have not all been defined yet.*
  - c. Facilities
    - a. *Attempting to produce “virtual fences” throughout the airport to define zones for passenger location. Then define what happens within the zone and what information to provide to the passenger*
    - b. *#1 location question is: “Where is the nearest bathroom?”*
  - d. Legal
  - e. Financial
    - a. *Expectations are that this can provide a new / improved revenue source for GOAA.*
  - f. Risk
    - a. *Obtaining enough self enrollment to make this offering a cost benefit to GOAA*
  - g. Operations
  - h. Regulatory
  - i. Security
  - j. Technology
    - a. *Primary technology concern is infrastructure*
5. Extent of integration with other self-service (passenger and non-passenger) applications and processes
  - a. *Wireless*
  - b. *Smart phones*
  - c. *Website*
6. Partnering stakeholders (airlines, concessionaires, vendors, etc.)
  - a. *Concessionaires*

- b. *Vendors – SITA, other vendors in the mobile app business*
  - c. *Airlines (uncertain as to role yet)*
- 7. Pricing models
  - a. Airlines
  - b. Concessionaires
- 8. Lessons learned

### **VIII. Distributed Antenna System (DAS)**

- a. *General:*
  - i. *We have installed a DAS primarily due to the resultant access needs of the main phone providers, having to deal with 4G requirements.*
- 1. Quantitative and qualitative benefits and costs
  - a. *Better phone service to airport passengers*
  - b. *Financial benefit to GOAA. The phone providers (each) pay \$1/4 mill/year*
- 2. Supporting technologies
- 3. Supporting policies, procedures, and processes
  - a. *Establishing policy for Telco use – data plans and regular phones*
- 4. Impacts:
  - a. Commercial
  - b. Planning
  - c. Facilities
  - d. Legal
  - e. Financial
  - f. Risk
  - g. Operations
  - h. Regulatory
  - i. Security
  - j. Technology
    - a. *We provided the Fiber infrastructure for the DAS*
- 5. Extent of integration with other self-service (passenger and non-passenger) applications and processes
- 6. Partnering stakeholders (airlines, concessionaires, vendors, etc.)
  - a. *Telco providers – Verizon, AT&T, T-Mobile, Sprint*
- 7. Pricing models
  - a. Airlines
  - b. Concessionaires
- 8. Lessons learned

### **IX. Airport Website**

- a. *General:*

- i. *We work hard at providing the passengers a website that provides useful information related to the airport. We are currently working on an upgrade of our website, including an official Orlando Airport App.*
- 1. Quantitative and qualitative benefits and costs
  - a. *Primary benefit is customer service to our passengers*
  - b. *Hope to use the website for self enrollment into our mobile apps, which will provide a source of revenue*
  - c. *Benefit as an avenue in conducting GOAA business*
  - d. *Tie to social media*
- 2. Supporting technologies
  - a. *Internet*
  - b. *Wireless Infrastructure*
  - c. *Mobile phones*
- 3. Supporting policies, procedures, and processes
- 4. Impacts:
  - a. Commercial
    - a. *Commercial impact for passenger revenue unknown at this time*
  - b. Planning
  - c. Facilities
    - a. *Provides Airport Guide section for information needed to navigate to, from, and around Orlando International Airport*
  - d. Legal
  - e. Financial
  - f. Risk
    - a. *GOAA finds itself in competition with the airlines as they produce their own websites*
  - g. Operations
  - h. Regulatory
  - i. Security
  - j. Technology
    - a. *Technology is working with the Webmaster in attempting to define some level of content*
- 5. Extent of integration with other self-service (passenger and non-passenger) applications and processes
  - a. *All social media avenues (twitter, Facebook, etc)*
  - b. *Mobile phone location base services app*
- 6. Partnering stakeholders (airlines, concessionaires, vendors, etc.)
  - a. *Vendors doing business with GOAA*
  - b. *Passengers*
  - c. *airlines*
- 7. Pricing models

- a. Airlines
  - b. Concessionaires
8. Lessons learned

**X. Parking Services**

- a. *General:*
    - i. *We provide various passenger services related to parking the car. We are always looking for new and innovative means. Those in use today include:*
      - 1. *E-PASS / SunPass to pay for parking – passengers can enter parking garages through specially marked lanes. No parking ticket is required. They pay as they exit by using the specially marked lanes. Fees are deducted from their City E-Pass/SunPass account.*
      - 2. *Cell-Phone Lot – Free*
      - 3. *Valet Parking - \$25*
      - 4. *Express Pick-Up / Drop-Off*
      - 5. *Car Detailing (through Valet) \$30 to \$45*
      - 6. *Static use of QR codes in parking garages for wayfinding – “where is my car?” – information can at least tell the passenger what garage and floor their car is on.*
- 1. Quantitative and qualitative benefits and costs
    - a. *With Parking as a top revenue source, much of the options above are implemented to provide additional revenue*
    - b. *Passenger Customer Service is a benefit*
  - 2. Supporting technologies
    - a. *GOAA has invested a significant amount of Wireless infrastructure in the garages (so far only the Rental Car areas)*
  - 3. Supporting policies, procedures, and processes
  - 4. Impacts:
    - k. Commercial
    - l. Planning
    - m. Facilities
    - n. Legal
    - o. Financial
    - p. Risk
    - q. Operations
    - r. Regulatory
    - s. Security
    - t. Technology
  - 5. Extent of integration with other self-service (passenger and non-passenger) applications and processes
  - 6. Partnering stakeholders (airlines, concessionaires, vendors, etc.)

7. Pricing models
  - c. Airlines
  - d. Concessionaires
8. Lessons learned

B. Self-Service Applications Planned or Being Investigated for Future Implementation

I. **Home Baggage Pickup**

1. Types of applications (social media, mobile apps, off-site presence, on-site amenities, etc.)  
– *Airline Dedicated applications and Bags, Inc. type applications.*
2. Business drivers – *Airlines are considering this service (UA was mentioned) because they already have the infrastructure in place, having to deliver lost bags to the homes. This would be a fee-based service and marketed as another customer service*
3. Intended outcomes – *uncertain at this time.*

II. **Additional Parking Services**

1. Types of applications (social media, mobile apps, off-site presence, on-site amenities, etc.)  
– *Use of WiFi to help triangulate on precise parking locations*
2. Business drivers – *customer service for the passenger*
3. Intended outcomes – *reduce complaints of lost vehicles*

III. **Improved Dynamic Signage**

1. Types of applications (social media, mobile apps, off-site presence, on-site amenities, etc.)  
– *We are looking at the need for a major improvement to the airport related to dynamic signage. This includes content management and use of advanced LED and other for advertising*
2. Business drivers – *customer service for the passenger, additional revenue sources, improved airport operational messaging*
3. Intended outcomes – *reduce complaints for wayfinding, improve image of the Airport*

IV. **Tablets for Airport Ambassadors**

1. Types of applications (social media, mobile apps, off-site presence, on-site amenities, etc.)  
– *We want to provide electronic tablets to all of our Ambassadors, so that they can better serve the passengers, in helping to answer their questions. This way, the Ambassadors can look up directly flight information, or airport stores, etc. Key driver is also the ability to do multi-language translations*
2. Business drivers – *customer service for the passenger*
3. Intended outcomes – *Ambassadors are better equipped to serve the needs of the passengers*

V. **Power Poles**

1. Types of applications (social media, mobile apps, off-site presence, on-site amenities, etc.)
  - *We want to provide more power plugs in the passenger areas. Equipment we are looking at include products such as the IER Power Pole that will slip between chairs. Costs are high though (\$1,200 per pole and \$2k for infrastructure).*
2. Business drivers – *customer service for the passenger*
3. Intended outcomes – *Airport can serve the power requirements of the passengers*

#### VI. NFC / Bluetooth

1. Types of applications (social media, mobile apps, off-site presence, on-site amenities, etc.)
  - *We are open to ideas in piloting programs involving this technology for the passengers.*
2. Business drivers – *customer service for the passenger*
3. Intended outcomes – *Unknown at this time*

#### C. Airport Strategic Objectives

1. Airport management culture
  - a. Attitude towards risk
    - *Airport Management prefers the IT be somewhat on the cutting edge. As such, they support the efforts with prototyping and staging new IT initiatives. Although some ideas may not succeed, GOAA thinks that IT exploration is necessary to keep up with the growth of the airport.*
  - b. Decision making process
    - *IT reports to Sr. Director of Administration and Technology*
2. Airport business drivers
  - a. IT initiatives align with strategic business objectives
  - b. Impact of passenger experience (customer satisfaction) on decision making process
    - *This is a key driver to our decision making process. We often times conduct projects, solely on the basis of improving the passenger experience. It is part of our theme.*
3. Financial Aspects:
  - a. Overall financial situation (indebtedness; healthy)
  - b. Financial Model
    - Recovery of Cost (compensatory, residual, hybrid) vs. Transfer of Cost
      - a. *Hybrid model – compensatory terminal; residual airfield*
    - Cost vs. benefits (for various stakeholders)
    - Funding (internal, external)
    - Impact on decision-making process
  - c. Lease Agreement Model
    - Preferred vs. Per-use or month-to-month

- Bonds
4. Airline business approach toward airport partner (e.g., branding)
  5. Airport business model toward airline partners (e.g., collaboration efforts)  
*Make attempts at working with airline partners, however, GOAA is currently (Oct 1, 2013) in rates by resolution due to airlines not adopting the latest lease/use agreement due to the construction of a \$1.1 billion capital project –South Terminal and Airside 4 renovations that did not gain support of airline partners.*
  6. Future considerations (e.g., terminal optimization efforts)

#### D. Airport Profile

1. Airport size classification
2. Facility/Terminal
  - a. Lay-out (equipment placement, security lanes configurations, etc)
  - b. Capacity for growth
3. Airline traffic trends/projections & passenger demographics
  - a. Common use vs. preferential use
    - *GOAA uses a significant amount of common use and has a goal of implementing common use check-in and gate are airport wide*
  - b. O&D vs. Connecting
    - *MCO is primarily an O&D airport*
  - c. International vs. domestic travel trends
    - *The greatest growth is in MCO's international traffic. Currently International traffic is growing at 5%, while domestic traffic is at a 1.5% growth rate. It is expected that this trend will continue.*
  - d. Business vs. leisure (family)
    - *Primarily leisure travel – lots of families and bags*
4. Aircraft types (size impacts potential self-service benefits)
5. CUPPS/CUSS
  - a. Maintenance/Support Model
    - *GOAA has an outsourced maintenance team provided by SITA*
6. IT Infrastructure at Airport
  - a. Ownership/Management
    - *GOAA owns all the IT Infrastructure and provides the management of this infrastructure*
  - b. Maturity/Scalability
    - *Although the infrastructure is a mature model, GOAA is constantly expanding its IT Infrastructure to support its needs. Examples include the Wireless and DAS discussed in these minutes.*
    - *Planning for infrastructure is vital. We have comm. Rooms every 200ft throughout our entire space. Core Rooms must be sized to accommodate*

*a massive amount of fiber. Business Continuity and Disaster Recovery must be assessed.*

7. Regional climate (impact on decision making)
  - a. *We attempt to take advantage of our temperate climate by providing more remote areas for check-in and baggage processing*

E. Follow Up Contacts / Meetings

1. *Follow up with Webmaster, Gerry Harris on web content ideas*
2. *GOAA has invested a considerable amount in its wireless infrastructure – measuring and monitoring of it as well. They may be a good case study for this purpose.*
3. *Other Airports / Airlines to look at include: Copenhagen, Heathrow, Munich, Dublin, Air New Zealand, Frankfurt*

## Appendix A8: Interview Notes – Seattle-Tacoma International Airport

### Interview Discussion Points

#### A. Self-Service Applications in Place Today – for the noted systems:

- *Self-Tagging (Bag tags through CUSS kiosks)*
  - *Hawaiian air – zone 1 (we have 7 zones for ticketing)*
    - *October 27 start*
    - *Very good customer service model – encourage passengers to use.*
  - *Alaska doing it on their proprietary*
  - *We anticipate growth*
  - *We had printers in them for a year before anyone used it*
- *Self Boarding*
  - *Airlines have shown interest*
  - *We have one running in the lab*
  - *Need BGR*
    - *Issues with CUTE not supporting*
    - *Need a CUPPS device*
  - *Airline driven*
    - *But we the airport want to encourage, because of putting in network. This type of project is ideal device to put in fiber in*
  - *It is on our technology road map*
- *Self Exit*
  - *One exit lane being used as a pilot*
  - *We are putting it in with*
  - *Using air-lock type doors – better than revolving*
  - *How do you facilitate / not encumber egress from the building in the event of a fire*
  - *We have 5 exits so far*
  - *We have had lots of false-positive alarms – fixing them*
  - *These are 15 lbs break away doors – won't hurt you if it closes on you*
  - *As of Jan 1, TSA will not staff the exit lanes*
  - *We have put a lot of cameras in*
  - *We have to account for a lot of variety, such as allowing police and fire to get through without setting off alarms*
- *Bag Drop*
  - *We are working on a self-bag drop project*
  - *3 locations in the terminal – 1<sup>st</sup> S end near the common use ticket counters*
  - *We want it to be an unattended self bag drop*
    - *We are working with our carriers to write a letter for TSA process*
    - *BSM messages are scanned – match the BSM with weights and*
    - *We are putting an interim step – podium with an attendant*

- 
- *Self service train*
  - *The person comes up to it – boards*
  - *We do have light rail to the airport coming*
  -
- *Interactive signage*
  - *Not much yet*
  - *Looking at something like 4 winds that actually can scan a boarding pass*
- *FIDS displays have terminal paging*
  - *We can do some advertising*
  - *Advertising is coming*
- *Clear channel has advertising*
  -
- *WiFi Upgrade (APs at every gate - future)*
  - *At every gate*
  - *We have coverage with our cellular DAS*
    - *Not really designed for WiFi – more linear*
    - *Does not support 802.11n or ac*
  - *Free at every gate*
  - *We have funded project underway for at least 2 APs are every gate*
    - *Maybe 3*
    - *We are doing this for location awareness as well*
      - *Some kind of mesh*
      - *Today, if you are in A-concourse and you log on to the free wifi web site, you get a different experience throughout, because we know where you are*
      - *As we add more APs, there will be finer granularity*
  - *Op-in function for location aware smart phone*
    - *Looking at this*
    - *Looking at i-beacons to provide wayfinding*
  - *Funded project*
    - *We in the departures hall*
  - *All upgraded in early 2014*
  - *We have \$3million project for 3 APs at the ramp*
    - *Will give us a lot of coverage*
  - *Coverage - bandwidth*
- *Video displays in cell phone lot*
- *Web site with SEA AP - 2014*
  - *Starting focus groups as to what the AP should do*
  - *We are going to offer really accurate, detailed way finding, which nobody else can do*

- *Google tried to map the facility, but it is very in-accurate*
- *Do some amazing thing with in-building way finding navigation*
- *We want passengers to Build an airport itinerary*
  - *Date, where you want to park, check bag or not*
  - *This would then help them navigate the airport*
- *We are expanding fiber quite a bit*
  - *Early 2004 we finished fiber throughout the facility*
  - *Now fiber to the gate*
  - *19 inch rack in the podium*
    - *12SM, 12MM to the gate*
  - *Doing a fiber ring around the facility as well*
- *Parking garage*
  - *Dynamic signage and image processing to count cars*
  - *We have tried valet and reserved, detailing, but...*
  - *Our challenge is that we have a very competitive market in parking*
- *We do a lot of passenger surveys*
  - *Very tech savvy*
  - *Parking stalls for free electric car charging*
  - *Green status – electricity is pretty cheap*
- *Facility services*
  - *We are doing a new contract for janitorial service*
  - *Simple people counters for usage of bathrooms*
    - *Now based on how many people go in/out*
    - *Instead of every 2 hours or so*
    - *More on demand verses schedule basis*
  - *We got feedback of people not wanting to touch the screens*
    - *So having a touchscreen next to the area,*
- *All pathfinders (airport ambassadors) have i-pads*
  - *We are doing a variety of things with Google maps*
  - *Flight information*
  - *Email reporting*
  - *Looking at going to min-ones*
- *Big thing we are doing is putting in power stations*
  - *Biggest complaint – lack of power*
  - *Power desks – some are stand up*
  - *USB as well as power*
- *Playing music in our holdrooms –*
  - *SEA-TAC music initiative*
  - *Can pump this to your smart phone*
  - *Variety is given*
- *Self Service Kiosk*

- *Partnership with TSA to accelerate Global Entry*
  - *Putting in 7 kiosks*
  - *TSA wants to encourage people to sign up*
  - *pr*
  - *Global Entry Kiosk*
    - *We have APC kiosks today*
      - *Most likely short lived, because at some point it will be a mobile app*
    - *Using SEA dark fiber, but their network electronics*
    - *Fiber to their closets – they provide their own small com-rooms*
  - *International arrival areas – building new facility today*
  - *Technology Strategy*
    - *Mobile*
    - *Self service*
    - 1. Quantitative and qualitative benefits and costs
    - 2. Supporting technologies
    - 3. Supporting policies, procedures, and processes
    - 4. Impacts:
      - a. Commercial
      - b. Planning
      - c. Facilities
      - d. Legal
      - e. Financial
      - f. Risk
      - g. Operations
      - h. Regulatory
      - i. Security
      - j. Technology
    - 5. Extent of integration with other self-service (passenger and non-passenger) applications and processes
      - a. *No integration between self-bag tag and bag drop*
      - b. *Most of these are autonomous*
    - 6. Partnering stakeholders (airlines, concessionaires, vendors, etc.)
      - a. *Our airlines are really promoting technology and self service*
      - b. *Some elements are exclusive*
      - c. *Self-service drives airline costs*
    - 7. Pricing models
      - a. Airlines
      - b. Concessionaires
    - 8. Lessons learned
- B. Self-Service Applications Planned or Being Investigated for Future Implementation

1. Types of applications (social media, mobile apps, off-site presence, on-site amenities, etc.)
    - a. *Social media – we have SharePoint, twitter, and quite a people following us*
    - b. *We don't allow a dialogue on Facebook today – maybe change in the future*
      - *It is perceived as a staffing issue to be responsive*
      - *Use a CRM product (salesforce.com) –does harvesting of social media sites that talk about SEA-TAC*
        - a. *Comments not complaints*
  2. Business drivers
    - a. *Customer service*
    - b. *Facility service*
      - *We view that technology will solve the space problem*
      - *We simply can't add space*
        - a. *Within 10 yrs \$32mill to \$45mill*
      - *Inspansion*
  3. Intended outcomes
- C. Airport Strategic Objectives
1. Airport management culture
    - a. Attitude towards risk
    - b. Decision making process
      - *We like to be a leader – an early adopter of technology*
  2. Airport business drivers
    - a. IT initiatives align with strategic business objectives
    - b. Impact of passenger experience (customer satisfaction) on decision making process
      - *We do a business plan every year with 7 strategic goals*
        - a. *46% of our business initiatives have technology tied to it*
      - *We really are an organization that looks for technology*
  3. Financial Aspects:
    - a. Overall financial situation (indebtedness; healthy)
    - b. Financial Model
      - Recovery of Cost (compensatory, residual, hybrid) vs. Transfer of Cost
      - Cost vs. benefits (for various stakeholders)
      - Funding (internal, external)
      - Impact on decision-making process
    - c. Lease Agreement Model
      - Preferred vs. Per-use or month-to-month
      - Bonds
  4. Airline business approach toward airport partner (e.g., branding)
  5. Airport business model toward airline partners (e.g., collaboration efforts)

6. Future considerations (e.g., terminal optimization efforts)

D. Airport Profile

1. Airport size classification
2. Facility/Terminal
  - a. Lay-out (equipment placement, security lanes configurations, etc)
  - b. Capacity for growth
3. Airline traffic trends/projections & passenger demographics
  - a. Common use vs. preferential use
  - b. O&D vs. Connecting
  - c. International vs. domestic travel trends
  - d. Business vs. leisure (family)
4. Aircraft types (size impacts potential self-service benefits)
5. IT Infrastructure at Airport
  - a. Ownership/Management
  - b. Maintenance/Support Model
  - c. Maturity/Scalability
6. Regional climate (impact on decision making)

## Appendix B: Airline Interview Notes

### I. Existing Self-Service Applications

- Self-Boarding / E-gates
- Web/Mobile/Kiosk Check-in
- WiFi in Aircraft
- Re-Check (IROPS)
- Mobile Applications
- Lounges
- Virtual Assistants
- Self-tagging
- Self-printed bag tags
- Self-service bag-drops
- Use of handheld devices as mobile check-in and information counters
- Baggage Weight Scales
- Queue management display signs
- Registration and real-time monitoring/tracking of baggage

### II. Current Focus of Self-Service Initiatives/Strategies

- Passenger convenience for long queues
- Improved passenger processing by increasing speed and optimizing existing facility space
- Customer Satisfaction Improvements
- Increase passenger control over their travel and journey experience
- Improved departure control and on-time performance
- Overall customer experience
- Facility Check-in Process
- New business opportunities
- Airport operational efficiency improvements
- Passenger to be able to self-serve in all situations
- Reduce Check-in space requirements
- Cost management
- Reduce hold-times at call center
- Gain competitive advantages

### III. Stakeholder Collaboration

- Generally the drivers of all initiatives at hub airport locations
- At non-hub locations, there are imposed limits to what can be done
- Insight into airport-owned facility locations (such as restaurants) is desired
- Airport governing authorities often impose limits
- Solutions often not integrated with the airport
- TSA restrictions

- Cooperation between airlines and airport is crucial especially regarding self-service initiatives

IV. Future/Planned Self-Service Efforts

- Expansion of Self-Service Initiatives via pilots and trial
- Focus on location-based services
- Overall infrastructure improvements, such as robust and secure WiFi

## **Appendix C: Case Study Reports**

**ACRP**

**Project 10-17**

**Implementing Integrated  
Self-Service at Airports**

**Task 3a:**

**Case Study Report #1a**

**Narita International Airport  
Corporation (NAA)**

TRANSPORTATION RESEARCH BOARD  
NAS-NRC

Submitted by:

**Barich, Inc.**

## INTRODUCTION

This Case Study Report (Report) documents the findings of the case study with the Narita International Airport Corporation (NAA). This Report contains the information collected during the site walks, presentations, and discussions with the NAA delegates. Relevant documents collected during the Case Study are included as Attachments to this Report. Although detailed analysis of the information collected will be conducted in a later task, this Report provides preliminary analyses to present relevance to the overall project objective.

The information contained herein is crucial for the development the framework for the Guidebook, especially the final section “Key Highlights/Take-Aways”, which highlight very valuable information and proposes specific areas where information will continue to be assimilated for use with the Guidebook.

The NAA has put in place an overall airport improvement strategy focusing on improving passenger services in general, with a special emphasis on passenger self-services, as encapsulated in its “i-Airport” initiative. It provides the fundamental basis for how the NAA assesses, establishes, plans, and tracks success of technology projects related to passenger self-services at all passenger journey points. It also includes how these IT initiatives integrate with each other, and how associated changes may impact other passenger self-services.

## BACKGROUND

### Entities/Location/Attendance

The Case Study was conducted at the offices of the NAA from 9:00 AM to 6:00 PM on April 8, 2014. The Agenda for the Case Study is included as Attachment 1. Research Team Members conducting the Case Study were Justin Phy (Principal Investigator) and Frank Barich (Lead Researcher). A complete list of the NAA Delegates that participated in the Case Study are included as Attachment 2.

The NAA Sponsor, Mr. Kazumi Hiraoka also assisted the Research Team in setting up for Case Study 1b, conducted at Haneda Airport (HND), with Japan Airlines (JAL). During Case Study 1b, Mr. Hiraoka and Mr. Tanaka from NAA also attended the meetings with JAL.

### Case Study Objectives

Based on secondary research on NRT and JAL, as well as an initial phone interview with and preliminary survey responses by the NAA Sponsor, the Team discovered useful information and valuable opportunities which identified NAA as well as JAL as strong case study subjects. Therefore, this case study entails the following objectives as:



- Understand as best as possible, the process in which an airport or airline chooses to introduce passenger self-services
- Evaluate the basis behind the planning and implementation of specific self-services
- Document the means in which the airport or airline measures the benefit of self-services, including discussing cost consideration affecting self-service initiatives.
- Understand the integrated components that may exist between the services, and the collaboration opportunities between airport and airline(s)
- Get a better understanding how social media supports self-services
- Inquire about future self-service initiatives, either planned or considered

## Research Approach

To meet the objectives, the Team had compiled a series of comprehensive worksheets and preparation documents designed to help facilitate the flow of meetings and collection of information. This documentation was discussed and sent to the case study coordinators prior to the actual on-site visit.

Once on site, the Research Team engaged with the various NAA delegates during a variety of meetings and workshops, which included presentations, discussions, and interviews. In addition, an airport site walk was conducted to experience the self-service efforts first hand.

## KEY HIGHLIGHTS/TAKE-AWAYS

This Case Study achieved very valuable results for the development of the project Guidebook.

### i-Airport

The NAA has adopted an “i-Airport” strategy, as a part of the overall airport improvement strategy. The Definition for “i-Airport” is given as:

*Utilizing cutting-edge information technology, we will optimize overall airport procedures, including security and operational efficiency. At the same time we will provide advanced airport service under the concept of a simple, fast and friendly airport, with a view to offering greater convenience for our customers.*

Further information regarding the “i-Airport” strategy is included in this Report in Attachment 3. This information, along with additional information on specific initiatives under the “i-Airport” strategy can be found on the Narita Airport website at, [http://www.naa.jp/en/i\\_airport/sap.html](http://www.naa.jp/en/i_airport/sap.html).



Understanding NAA’s methodology behind “i-Airport” is important to this project, because it provides the fundamental basis for how the NAA plans for and tracks success regarding technology projects related to passenger self-services. The Figure 1 illustrates NAA’s new initiatives against the primary objectives. Information such as this, along with all noted initiatives will be further investigated, along with the NAA approach to planning, as described in the next section.

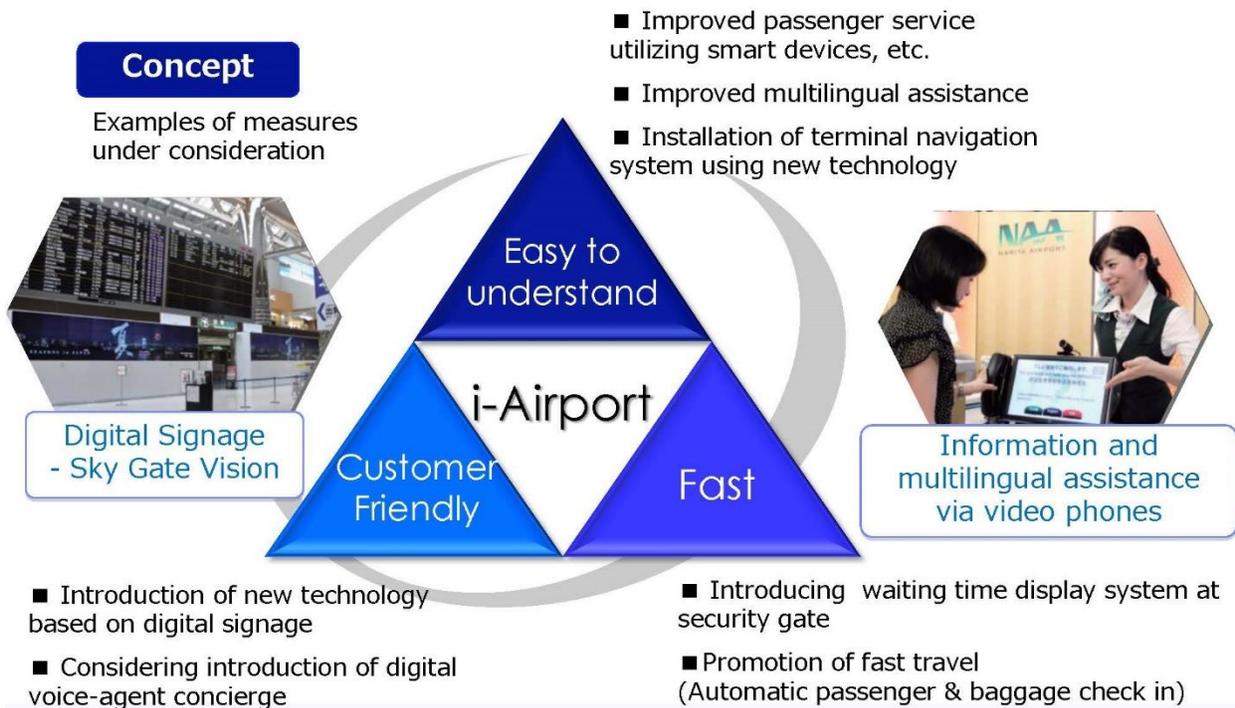


Figure 1. NAA New Initiative Mapped Against Objectives.

## Planning

The NAA provided a detailed discussion on the approach to Airport Planning. Their internal analysis focused on understanding their competition from a local / regional area, then from a global perspective. By understanding their competition, the NAA could then analyze how to improve its own internal processes; of which the time a passenger takes to arrive and go through the airport was key. The NAA has also started to assess how well the airport, along with its airline tenants, complies with IATA’s Simplifying the Business (STB) objectives. By doing so, the NAA plans to improve the self-service process across all passenger journey points. Once Planning has established the overall objectives, the IT Planning, IT Development and Planning Department (and some related departments) then establishes IT projects and goals to help achieve the overall objectives.

Understanding NAA's methodology behind airport planning is important to this project, because it helps to assess how IT initiatives are established and tracked for success. Attachment 4 provides background information on the NAA planning approach.

### **Tracking Success through the Evolving Narita Airport**

The NAA provided a detailed discussion on the approach for tracking passenger service enhancements to airport operational areas. Attachment 5 provides a graphic of the Service Enhancement Map.

Understanding NAA's methodology behind tracking the evolving processes is important to this project, because it helps to assess how IT initiatives integrate with each other, and how associated changes may impact other passenger self-services.

### **Site Walk of Narita Airport**

The NAA hosted a site walk of the airport, during which the Research Team discussed various initiatives to better understand the NAA approach to passenger self-services. Attachment 6 provides a sampling of the photographs taken during the site walk.



## ATTACHMENT 1

### Case Study Agenda

Date & Time	Content
7 April Mon	Case study with JAL at HND
8 April Tue 08:50	<p style="text-align: center;"><u>Assemble with NAA staff</u> <i>Assemble point: Please refer to the map "Assemble Point" After Security check at Train station (Airport Terminal 2 Station), B1, Terminal 2</i></p> <p><b><u>NAA's delegation</u></b> <b>Mr. Kazumi Hiraoka</b>, Senior Manager, Communications and Information Systems, Engineering Department <b>Ms. Yuki Kinjo</b>, Supervisor, International Policy and Planning Office, Planning Department</p>
09:00	<u>Arrive at the meeting room in NAA head office</u>
09:10-09:30	<p style="text-align: center;"><u>Overview of ACRP 10-17 Case Study by Mr. Frank Barich</u></p> <p><b><u>NAA's delegation</u></b> <b>Mr. Kazumi Hiraoka</b>, Senior Manager, Communications and Information Systems, Engineering Department <b>Mr. Yoshinori Tanaka</b>, Senior Manager, Corporate Strategies Office, Planning Department <b>Mr. Ryuichi Iizasa</b>, Manager, Corporate Strategies Office, Planning Department</p> <p><b>Mr. Shohei Nomura</b>, IT and Communications Systems, Facilities Management Department <b>Ms Hisako Toyoda</b>, Supervisor, IT Planning, IT Development and Planning Department <b>Ms. Yuka Terajima</b>, IT Planning, IT Development and Planning Department <b>Mr. Yuki Kubota</b>, IT Planning, IT Development and Planning Department <b>Mr. Yuichi Nakada</b>, International Policy and Planning Office, Planning Department, <b>Ms. Yuki Kinjo</b>, Supervisor, International Policy and Planning Office, Planning Department</p>



Date & Time	Content
09:30-12:00	<p style="text-align: center;"><u>Airport Tour (Passenger Terminal Building 2)</u></p> <p style="text-align: center;"><i>Suggested route:</i></p> <p><i>Train station → Departure Lobby → Information Counter, Videophone → Digital Signage → (move to airside) → Narita 5<sup>th</sup> Avenue → Gate area → (move to landside) → Digital Passenger Guide Panel at concession area</i></p> <p>✧ <i>Demonstration of Navigation app at airside</i></p> <p><b><u>NAA's delegation</u></b></p> <p><b>Mr. Kazumi Hiraoka</b>, Senior Manager, Communications and Information Systems, Engineering Department</p> <p><b>Mr. Toru Motoyoshi</b>, Sennior Manager, Passenger Services, Passenger Terminal Management Department</p> <p><b>Mr. Takahiro Suzuki</b>, Manager, Property Management II, Passenger Terminal Management Department</p> <p><b>Mr. Yasuki Yamazaki</b>, Passenger Services, Passenger Terminal Management Department</p> <p><b>Mr. Yoshinori Tanaka</b>, Senior Manager, Corporate Strategies Office, Planning Department</p> <p><b>Mr. Ryuichi Iizasa</b>, Manager, Corporate Strategies Office, Planning Department</p> <p><b>Mr. Shohei Nomura</b>, IT and Communications Systems, Facilities Management Department</p> <p><b>Mr. Yuki Kubota</b>, IT Planning, IT Development and Planning Department</p> <p><b>Mr. Yuichi Nakada</b>, International Policy and Planning Office, Planning Department,</p> <p><b>Ms. Yuki Kinjo</b>, Supervisor, International Policy and Planning Office, Planning Department</p>
12:00-13:15	<u>Lunch (2 PTB)</u>



<p>13:30-14 : 50</p>	<p style="text-align: center;"><u>Meeting 1</u>  <u>Overview of Narita International Airport</u></p> <p>◇ IT, automation, self-service initiative at Narita International Airport</p> <p><b><u>NAA's delegation</u></b>  <b>Mr. Kazumi Hiraoka</b>, Senior Manager, Communications and Information Systems, Engineering Department  <b>Mr. Hideharu Miyamoto</b>, Vice President, Corporate Strategies Office, Planning Department  <b>Mr. Yoshinori Tanaka</b>, Senior Manager, Corporate Strategies Office, Planning Department  <b>Mr. Ryuichi Iizasa</b>, Manager, Corporate Strategies Office, Planning Department</p> <p><b>Mr. Shohei Nomura</b>, IT and Communications Systems, Facilities Management Department  <b>Mr. Yuichi Nakada</b>, International Policy and Planning Office, Planning Department,  <b>Ms. Yuki Kinjo</b>, Supervisor, International Policy and Planning Office, Planning Department</p>
<p>15:00</p>	<p style="text-align: center;"><u>Meeting 2</u>  <u>"i-Airport" initiative</u></p> <p>◇ Overview of "i-Airport" initiative          ◇ App</p> <p><b><u>NAA's delegation</u></b>  <b>Mr. Kazumi Hiraoka</b>, Senior Manager, Communications and Information Systems, Engineering Department  <b>Ms Hisako Toyoda</b>, Supervisor, IT Planning, IT Development and Planning Department  <b>Ms. Yuka Terajima</b>, IT Planning, IT Development and Planning Department  <b>Mr. Yuki Kubota</b>, IT Planning, IT Development and Planning Department  <b>Mr. Yoshinori Tanaka</b>, Senior Manager, Corporate Strategies Office, Planning Department  <b>Mr. Ryuichi Iizasa</b>, Manager, Corporate Strategies Office, Planning Department</p> <p><b>Mr. Shohei Nomura</b>, IT and Communications Systems, Facilities Management Department</p>



	<p><b>Mr. Toru Motoyoshi</b>, Senior Manager, Passenger Services, Passenger Terminal Management Department  <b>Mr. Takahiro Suzuki</b>, Manager, Property Management II, Passenger Terminal Management Department  <b>Mr. Yasuki Yamazaki</b>, Passenger Services, Passenger Terminal Management Department  <b>Mr. Yuichi Nakada</b>, International Policy and Planning Office, Planning Department,  <b>Ms. Yuki Kinjo</b>, Supervisor, International Policy and Planning Office, Planning Department</p>
<p>16:30</p>	<p style="text-align: center;"><u>Meeting 3</u></p> <p style="text-align: center;"><u>Pre-booking system for car park, It, self-service initiatives from facility perspective</u></p> <ul style="list-style-type: none"> <li>◇ Pre-booking of car parks</li> <li>◇ IT facilities: Digital Signage, flight information, NFC, WiFi etc</li> </ul> <p><b><u>NAA's delegation</u></b>  <b>Mr. Kazumi Hiraoka</b>, Senior Manager, Communications and Information Systems, Engineering Department  <b>Mr. Shinichi Sato</b>, Senior Manager, Property Management, Aviation Marketing, Support &amp; Coordination Department  <b>Mr. Kenichiro Takahashi</b>, Supervisor, Property Management, Aviation Marketing, Support &amp; Coordination Department  <b>Mr. Shohei Nomura</b>, IT and Communications Systems, Facilities Management Department  <b>Mr. Yoshinori Tanaka</b>, Senior Manager, Corporate Strategies Office, Planning Department  <b>Mr. Ryuichi Iizasa</b>, Manager, Corporate Strategies Office, Planning Department</p> <p><b>Ms. Hisako Toyoda</b>, Supervisor, IT Planning, IT Development and Planning Department  <b>Ms. Yuka Terajima</b>, IT Planning, IT Development and Planning Department  <b>Mr. Yuki Kubota</b>, IT Planning, IT Development and Planning Department  <b>Mr. Toru Motoyoshi</b>, Senior Manager, Passenger Services, Passenger Terminal Management Department  <b>Mr. Takahiro Suzuki</b>, Manager, Property Management II, Passenger Terminal Management Department  <b>Mr. Yasuki Yamazaki</b>, Passenger Services, Passenger Terminal Management Department</p>



	<b>Mr. Yuichi Nakada</b> , International Policy and Planning Office, Planning Department, <b>Ms. Yuki Kinjo</b> , Supervisor, International Policy and Planning Office, Planning Department
17:30	End

## ATTACHMENT 2

### NAA Delegates

Name	Job Title	Email Address
Mr. Yoshinori Tanaka	Senior Manager, Corporate Strategies Office, Planning Department	yo-tanaka@naa.jp
Mr. Ryuichi Iizasa	Manager, Corporate Strategies Office, Planning Department	r-iizasa@naa.jp
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Ms. Yuka Terajima	IT Planning, IT Development and Planning Department	y-terajima@naa.jp
Mr. Yuki Kubota	IT Planning, IT Development and Planning Department	yuk-kubota@naa.jp
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Mr. Yasuki Yamazaki	Passenger Services, Passenger Terminal Management Department	yasu-yamazaki@naa.jp
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Mr. Kazumi Hiraoka	Senior Manager, Communications and Information Systems, Engineering Department	k-hiraoka@naa.jp
Mr. Yuichi Nakada	Senior Manager, International Policy and Planning Office, Planning Department	y-nakada@naa.jp
Ms. Yuki Kinjo	Supervisor, International Policy and Planning Office, Planning Department	yuki-kinjyo@naa.jp



**ATTACHMENT 3**  
**I – Airport Project**  
**Enhancing Customer Service by Utilizing Smart Devices**



**Index**

WORLD SKY GATE \_ NARITA

1

- 1) What is the i-Airport strategy?**
- 2) Priorities**
- 3) Service improvement measures using smart devices - examples**
- 4) NAA's smart airport vision**



## 1) What is i-Airport strategy?

WORLD SKY GATE \_ NARITA

2



August 2010: Project launched

### Objective



# 1) What is the i-Airport strategy?

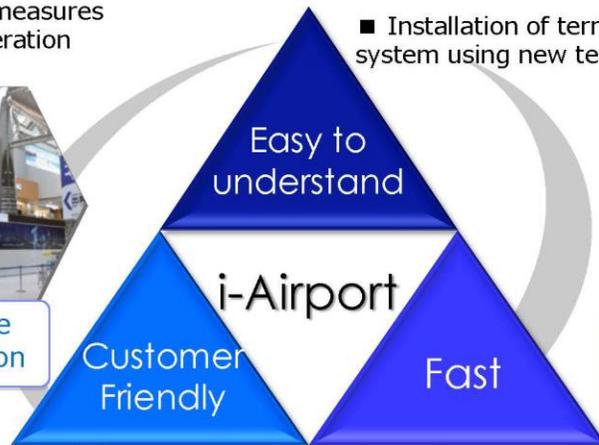
3

## Concept

Examples of measures under consideration



Digital Signage - Sky Gate Vision



- Improved passenger service utilizing smart devices, etc.
- Improved multilingual assistance
- Installation of terminal navigation system using new technology



Information and multilingual assistance via video phones

- Introduction of new technology based on digital signage
- Considering introduction of digital voice-agent concierge

- Introducing waiting time display system at security gate
- Promotion of fast travel (Automatic passenger & baggage check in)



## 2) Priorities

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### Improved customer service using smart devices

- (Background)
- Growth in number of smartphone users
  - Emergence of high spec tablet PCs



## 2) Priorities

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### Themes

	Completed				
	Under further development				
	Free Wireless LAN expansion	iPad Passenger info	Multilingual audio Translation app	Terminal Nav app	Concierge app
<b>Customer information</b> Staff-based, person-to-person assistance and provision of information catering to individual needs					
<b>Multilingual Assistance</b> Improved multilingual assistance for growing number of Chinese and Korean visitors					
<b>Internet improvement</b> Provision of comfortable Internet environment for smartphone and other Wi-Fi users					



### 3) Service improvement measures using smart devices

6

App 01 & 02

#### Promoting apps



### 3) Service improvement measures using smart devices

7

#### App 01

##### Multilingual audio translation application

##### Multilingual Assistance

#### Objective

eliminate the language barrier for all passengers.



- Application name: **NariTra**
- Released in December 2011
- Charge: Free
- Compatible with: iPad, iPhone, Android
- Languages: English, Chinese, Korean, Japanese, Indonesian, Thai<sup>※</sup>, French<sup>※</sup>, Spanish<sup>※</sup>
- Number of downloads:  
Approx. 317,000 as of Mar 2014

※Support only text input



### 3) Service improvement measures using smart devices

8

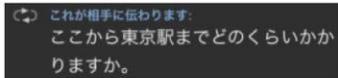
#### Voice recognition result

The words recognized by the system are displayed.  
This is what you said.



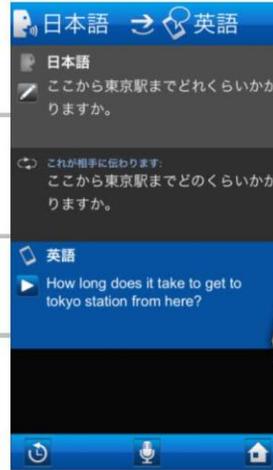
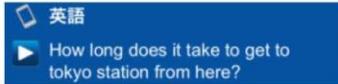
#### Reverse translation result

The translation (below) is translated back again into the original language and displayed here. If the text displayed here has the same meaning as what you have said, the translation is approximately correct.



#### Translation result

This is the translation of what you have said.



Minister for Internal Affairs and Communications  
Award at the 11th annual Merit Awards for  
Industry-Academia-Government Collaboration



#### 4) Service improvement measures using smart devices

9

App 02

Terminal Navigation app

Customer information



##### Objective

Provide increasing number of smartphone users with present position information and directions to a given location, cater to individual needs and improve customer service.

- Released in July 2012
- Charge: Free
- Compatible with iPhone and Android
- Languages: Japanese, English, Chinese, Korean
- Number of downloads:  
Approx. 110,000 as of Mar 2014



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APR. 2014

### 3) Service improvement measures using smart devices

10

#### Concept & functions

- Terminal position information using Wi-Fi
- Navigation function using AR technology
- Flight information: Push-based information delivery service on delays and gate changes
- Provision of facility and shop information, etc.



Register your flight and countdown to departure begins



### 3) Service improvement measures using smart devices

11

App 03

Voice-agent concierge app

Customer information



#### Objective

Produce a voice-agent concierge application to provide terminal information by simply speaking into smartphones, in order to respond to individual needs and improve customer service.



I want some sushi

sushi

There are the sushi restaurants in Terminal 2.

shi-Iwa  
aku



- Application name: **Narita Concierge NariCo**
- Release: November 2013
- Charge: Free
- Compatible with: Android
- Languages: Japanese



#### 4) NAA's smart airport vision

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APR. 2014

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**ATTACHMENT 4**  
**NAA Planning**  
**Strategy of Narita International Airport for Expansion of its**  
**International Air Services Network**



**Strategy of**  
**Narita International Airport**  
**for expansion of its international air**  
**services network**

April 2014  
Narita International Airport Corporation

WORLD SKY GATE \_ NARITA

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Task 3a: Case Study Report #1a – NAA  
Transportation Research Board  
April 1, 2014

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# Overview of Narita International Airport

WORLD SKY GATE \_ NARITA

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## Facilities at Narita International Airport



As of April 1, 2013

Airport site area	2,693 acres (1,090ha)		Passenger handling capacity	Terminal 1	25 million
Runways	Runway A: 13,123 ft (4,000m)		Car parks	Terminal 2	17 million
	Runway B: 8,202ft (2,500m)			Customer parking: 39 large vehicles, 3,242 cars	
Taxiways	103,675 ft (31,600m)		Business-use parking: 120 large vehicles, 6,750 cars		
Aprons	593 acres (240ha)		No. of airlines at Narita (30Jun-13July, 2013)	84	
No. of stands	161		No. of cities on Narita's network (30Jun-13July, 2013)	Overseas: 102 cities in 36 countries and 3 territories Japan: 14 cities	
Passenger handling facilities	Terminal 1	Floor space: 111 acres (451,000m <sup>2</sup> )	Operating hours	24 hours (Curfew between 23:00 and 6:00)	
	Terminal 2	Floor space: 91 acres (370,000m <sup>2</sup> )	No. of check-in counters	Terminal 1	340
Cargo facilities	21 facilities, floor space: 70 acres (283,700m <sup>2</sup> )			Terminal 2	244

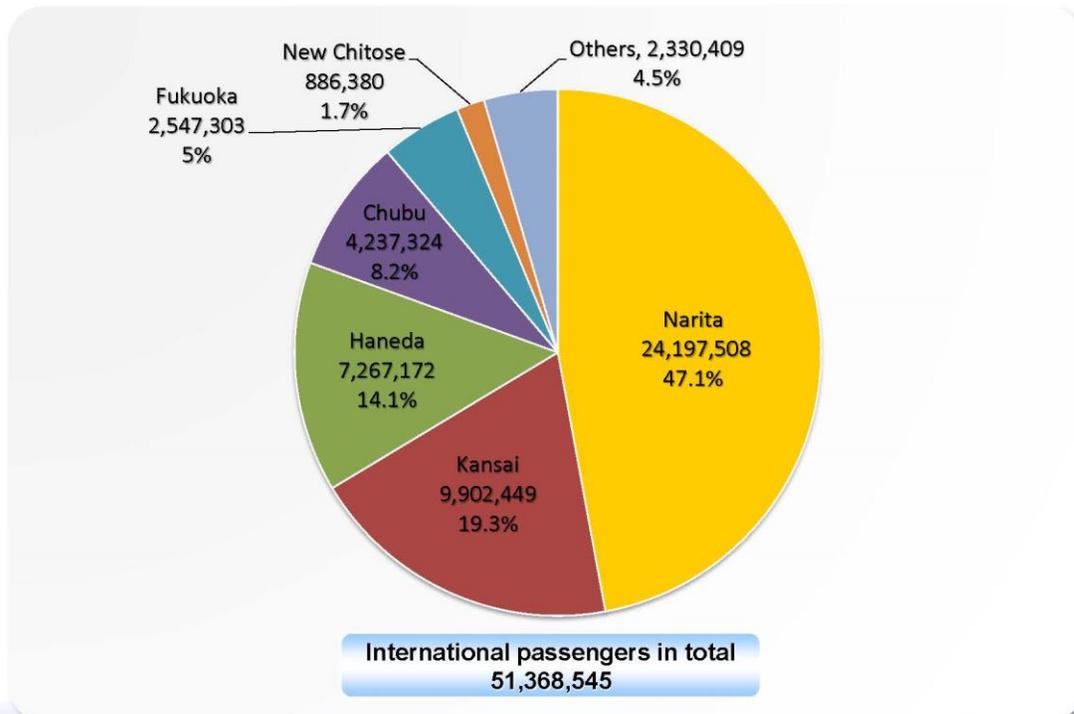
## Comparison between DEN and NRT

	DEN (As of Nov. 2011)	NRT (As of Jul. 2012)
Operator	City & County of Denver, Department of Aviation	Narita International Airport Corporation
Open	February 1995	May 1978
Location	25 miles from downtown Denver [Elevation AMSL 5,431ft (1,655m)]	36 miles east from downtown Tokyo [Elevation AMSL 135ft (41m)]
TTL Property	34,274acres (13,870ha)	2,693acres (1,090ha)
Runways	16,000ft (4,877m) × 1 12,000ft (3,658m) × 5	13,123ft (4,000m) × 1 8,202ft (2,500m) × 1
Cities Served	160 Cities [Intl: Canada, Latin America, Europe (LHR, FRA, RKV (Reykjavik))]	102 Cities [36 Countries 3 Regions] ( 30Jun-13July, 2013)
Air Carries	14 Airlines [Intl: AC, BA, LH, AM, FI (Icelandair)]	84 Airlines [36 Countries 3 Regions]
Operational Hours	24 Hours	24 Hours [Curfew 23:00~6:00]
Operation (Per Year)	Flights: 630 k Passengers: 52mil (Intl: 2mil) Cargo: 251k (Metric Tonnes) (Source: ACI World Traffic Report 2010)	Flights: 212 k Passengers: 33 mil (Intl: 29mil) Cargo: 1,921k (Metric Tonnes) [FY2012]
Number of Spots	95 (+62 spots for Regional jets)	150
TTL Floor Space	Jeppesen Terminal: 57acres (232,000m <sup>2</sup> ) Concourse A+B+C: 122acres (493,000m <sup>2</sup> )	Terminal1: 111acres (451,000 m <sup>2</sup> ) Terminal2: 91acres (370,000 m <sup>2</sup> )
Parking Lot	TTL: 38,000	[Passenger] Large Vehicle 39 / Car 3,242 [Commercial Vehicle] Large Vehicle 120 / Car 6,750

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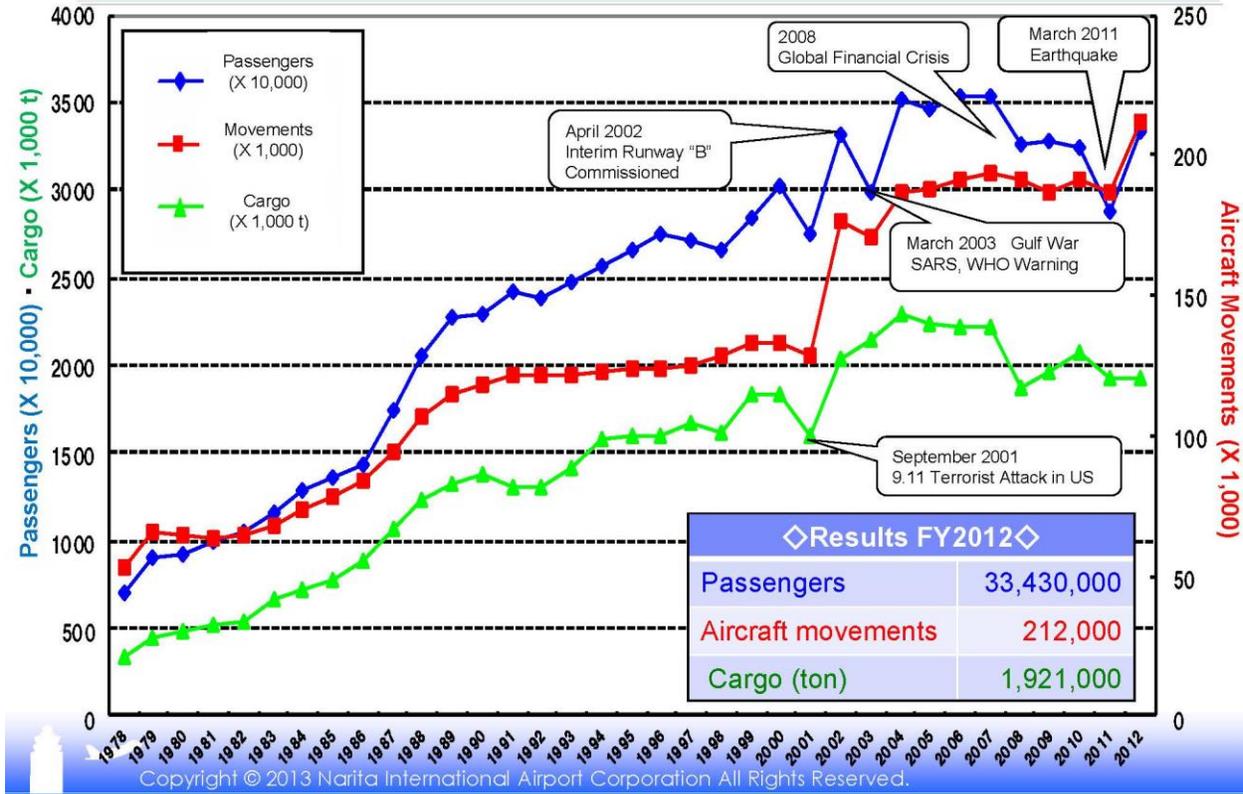
## Ranking and Share of International Passenger Numbers in Japan



※Source: Compiled from data of international passenger number from MLIT as of FY 2011

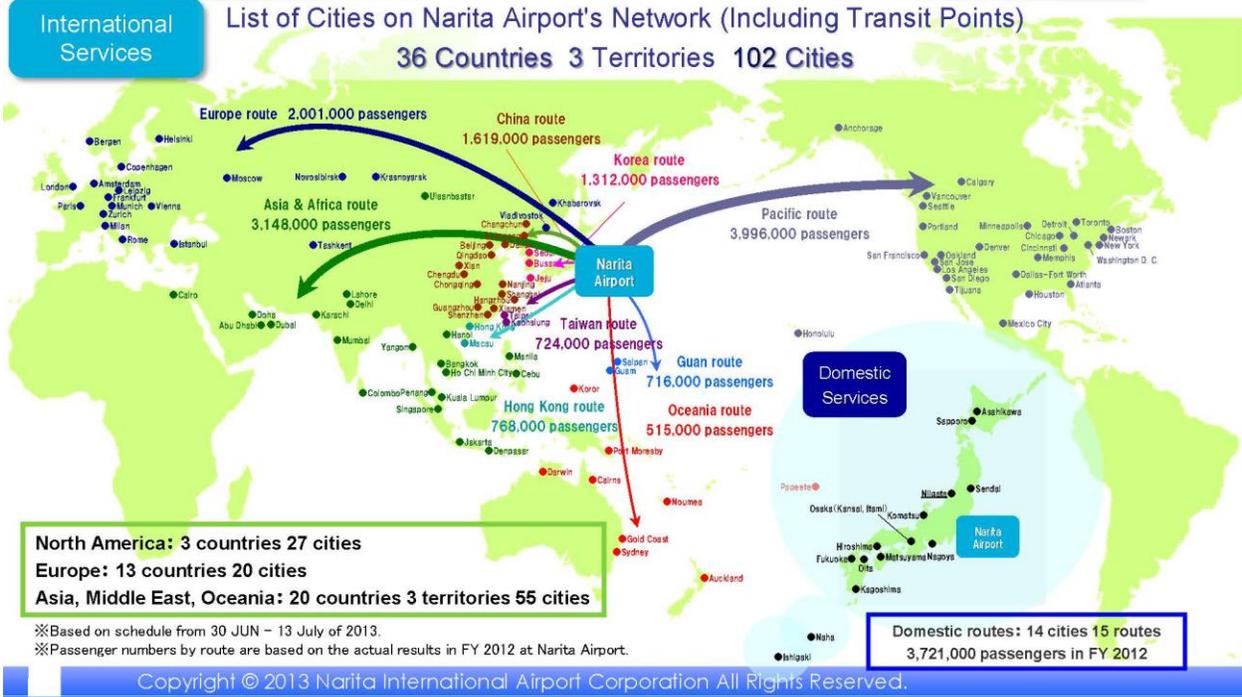
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## Operational Results (from FY1978~FY2012)



## Network at Narita International Airport

Narita links Asia to North America and has the advantage of its well-balanced network which is connected with 102 cities in the world.



## Airlines at Narita International Airport

84 airlines operate at Narita.

As of 2013 Summer

### Terminal 1 North Wing



### Terminal 1 South Wing



### Terminal 2



### Cargo



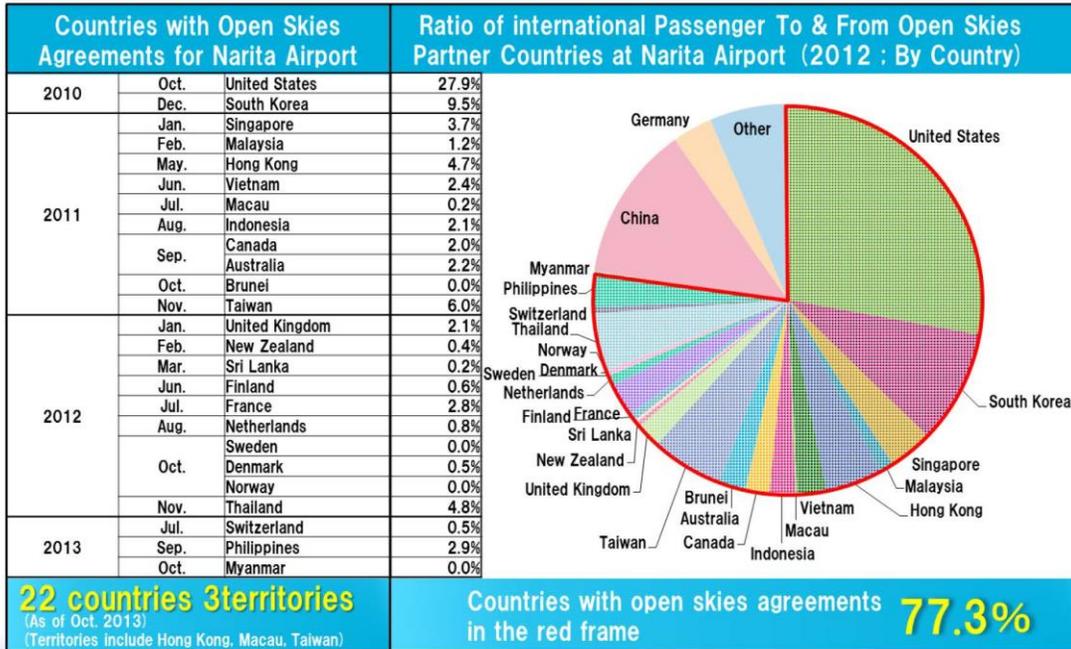
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## LCCs at Narita International Airport

Airlines	Service Commenced	Terminal	Destinations( Number of Flights/week and day) [As of 1 August, 2013]	
 Jetstar Japan	July 2012	2PTB	Dom	<ul style="list-style-type: none"> <li>● Naria - Sapporo( New Chitose ) [ 42/week ] [ 6/day ]</li> <li>● Narita - Osaka( Kansai ) [ 14/week ] [ 2/day ]</li> <li>● Narita - Matsuyama [ 21/week ] [ 3/day ]</li> <li>● Narita - Fukuoka [ 35/week ] [ 5/day ]</li> <li>● Narita - Oita [ 21/week ] [ 3/day ]</li> <li>● Narita - Kagoshima [ 14/week ] [ 2/day ]</li> <li>● Narita - Naha [ 21/week ] [ 3/day ]</li> </ul> <b>Total 168/week [ 24/day ]</b>
 Air Asia Japan	August 2012	2PTB	Dom	<ul style="list-style-type: none"> <li>● Naria - Sapporo( New Chitose ) [ 21/week ] [ 3/day ]</li> <li>● Narita - Fukuoka [ 14/week ] [ 2/day ]</li> <li>● Narita - Naha [ 7/week ] [ 1/day ]</li> </ul> <b>Total 42/week [ 6/day ]</b>
			Int'l	<ul style="list-style-type: none"> <li>● Narita - Incheon( Seoul ) [ 14/week ] [ 2/day ]</li> <li>● Narita - Busan [ 7/week ] [ 1/day ]</li> <li>● Narita - Taipei [ 7/week ] [ 1/day ]</li> </ul> <b>Total 28/week [ 4/day ]</b>
 Jetstar Airways (Australia)	December 2008	2PTB	Int'l	<ul style="list-style-type: none"> <li>● Narita - Cairns [ 7/week ] [ 1/day ]</li> <li>● Narita - Gold Coast [ 7/week ] [ 1/day ]</li> <li>● Narita - Darwin( via Manila ) [ 4/week ] [ 0~1/day ]</li> </ul> <b>Total 18/week [ 2~3/day ]</b>
 Air Busan (South Korea)	Jun 2011	1PTB		<ul style="list-style-type: none"> <li>● Narita - Busan [ 7/week ] [ 1/day ]</li> </ul>
 Eastar Jet (South Korea)	July 2011	2PTB		<ul style="list-style-type: none"> <li>● Narita - Incheon [ 7/week ] [ 1/day ]</li> </ul>
 Scoot (Singapore)	October 2012	2PTB		<ul style="list-style-type: none"> <li>● Narita - Singapore( via Taipei ) [ 7/week ] [ 1/day ]</li> </ul>
 Jeju Air (South-Korea)	July 2013	2PTB		<ul style="list-style-type: none"> <li>● Narita - Incheon [ 14/week ] [ 2/day ]</li> </ul>
				LCC( Domestic ) 210/week [ 30/day ] LCC( International ) 81/week [ 11~12/day ] LCC( Domestic+International ) 291/week [ 41~42/day ]

# The Environment Surrounding Narita International Airport - Progress of Open Skies

Open Skies Agreements for Narita Airport



※Source: Compiled by NAA from ADI(Sabre Airport Data Intelligence) data  
 ※Includes transit Passengers

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## Ranking of O&D departures from Narita (CY2011)

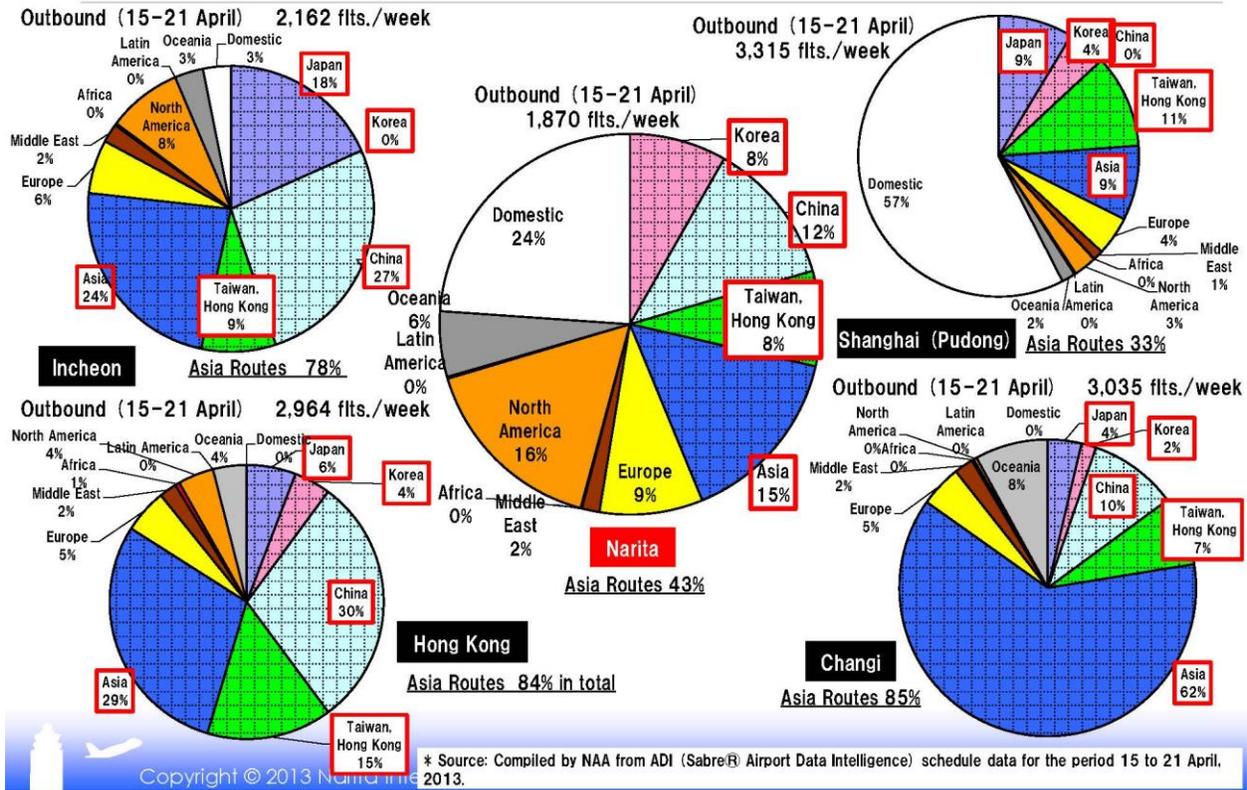
Rank	City	Country	Passengers
1	Shanghai	China	611,739
2	Seoul	South Korea	591,394
3	Honolulu	United States	518,480
4	Taipei	Taiwan	491,076
5	Guam	Guam	454,440
6	Hong Kong	Hong Kong	428,156
7	Bangkok	Thailand	373,724
8	Paris	France	312,426
9	Beijing	China	273,951
10	London	United Kingdom	248,904
11	Singapore	Singapore	240,237
12	Los Angeles	United States	234,578
13	Manila	Philippines	205,515
14	New York	United States	200,514
15	Jakarta	Indonesia	185,430



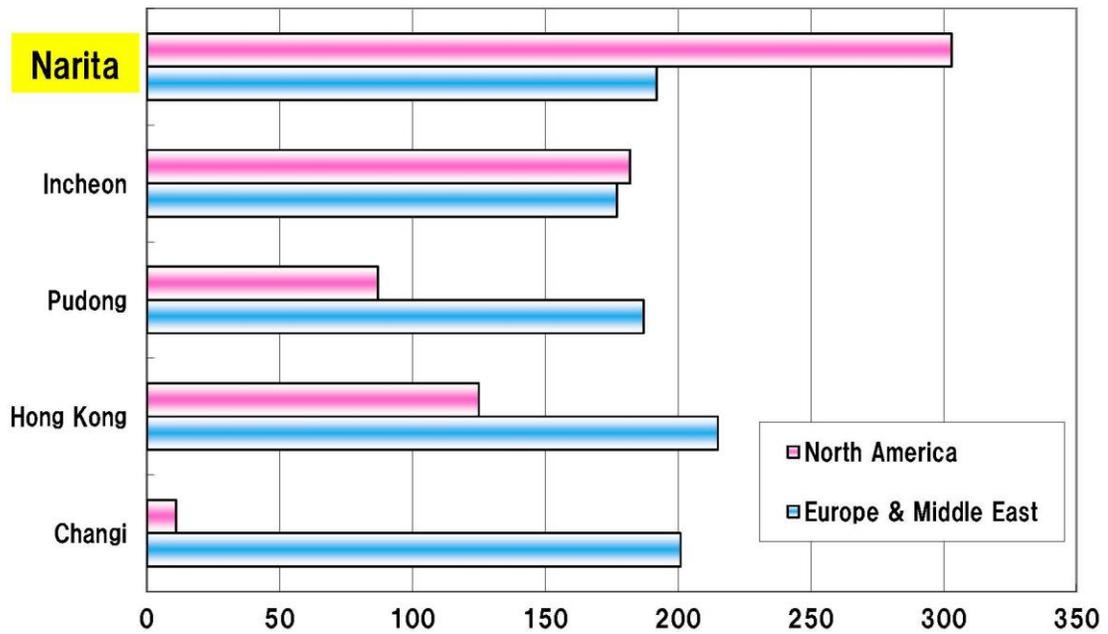
Source : Compiled from Sabre ADI(Airport Data Intelligence)  
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<http://airdi.com/>



## Route Characteristics of Key Asian Airports



## North America & Europe Services (Number of Outbound Flights per Week)



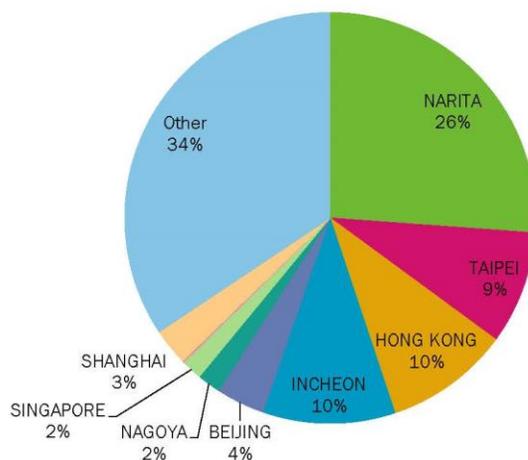
Source: Compiled from Airport Data Intelligence/Sabre schedule data for the period 15 - 21 April 2013

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## Asia ⇒ North America Passenger Figures by Connection Point

- **Narita Airport is the No. 1 connection point for passengers traveling from major countries in Asia to North America**

Passenger Ratio by Connection Point  
【Major Countries in Asia ⇒ North America】

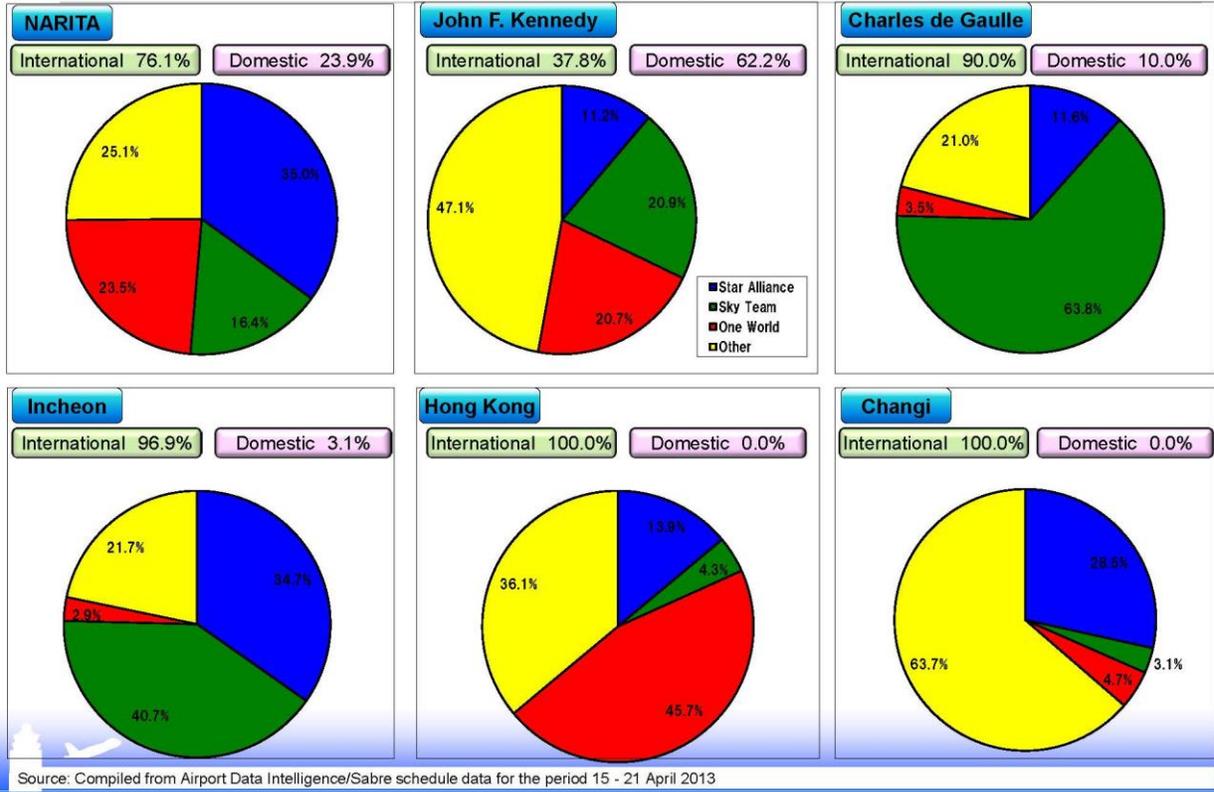


• Major Countries in Asia: China, South Korea, Taiwan, Hong Kong, Vietnam, Air Philippines, Thailand, Malaysia, Singapore, Indonesia

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Source: Compiled by NAA based on ADI® (Airport Data Intelligence)

## Share of Flights by Airline Alliances



## Impact of Haneda's Internationalization

- Flights for major European countries are barely maintained, but the number of flights is decreased.
- Reduction of Japanese carriers' flights for major Asian countries at NRT decreases the opportunities for transit in the morning

**【Impact of S14 Haneda's Internationalization】**

Nation	Airline	Network	Before	After	Difference
U.K	ANA	NRT-LHR	7FLTs/W	—	▲ 7 FLTs/W
	JAL	NRT-LHR	7FLTs/W	—	▲ 7FLTs/W
France	AFR	NRT-CDG	14FLTs/W	7FLTs/W	▲ 7FLTs/W
Germany	ANA	NRT-DUS	—	7FLTs/W	+ 7FLTs/W
		NRT-MUC	7FLTs/W	—	▲ 7 FLTs/W
		NRT-FRA	7FLTs/W	—	▲ 7FLTs/W
	DLH	NRT-MUC	7FLTs/W	—	▲ 7 FLTs/W
Singapore	ANA	NRT-SIN	14FLTs/W	7FLTs/W	▲ 7 FLTs/W
	JAL	NRT-SIN	14FLTs/W	7FLTs/W	▲ 7 FLTs/W
Thailand	ANA	NRT-BKK	14FLTs/W	7FLTs/W	▲ 7 FLTs/W
	JAL	NRT-BKK	14FLTs/W	7FLTs/W	▲ 7 FLTs/W

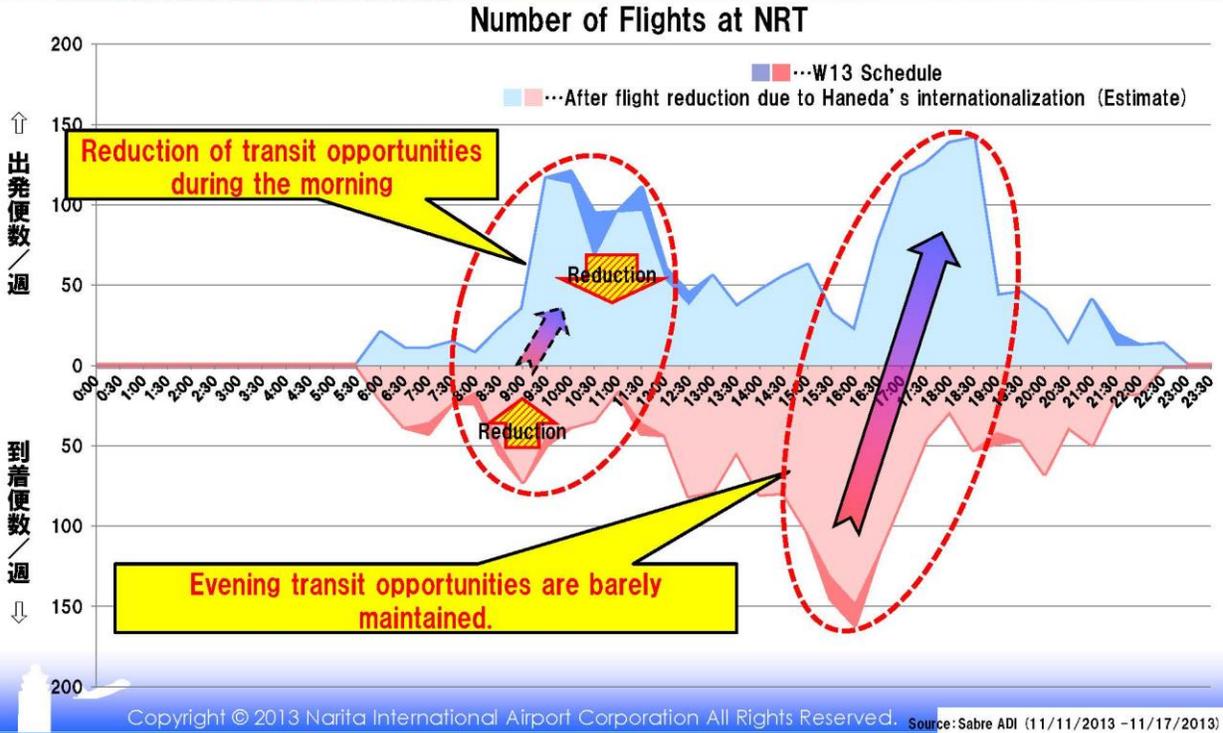


**✓ FSC's networks are divided into NRT and HND, which could result in the dysfunction of airlines' network**

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## Reduction of transit opportunities

→ Reduction of transit opportunities which is Important factor for NRT as a connecting point between Asia and North America



## Narita's Target

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## Narita's Target

### → Meeting hub requirements of the FSCs

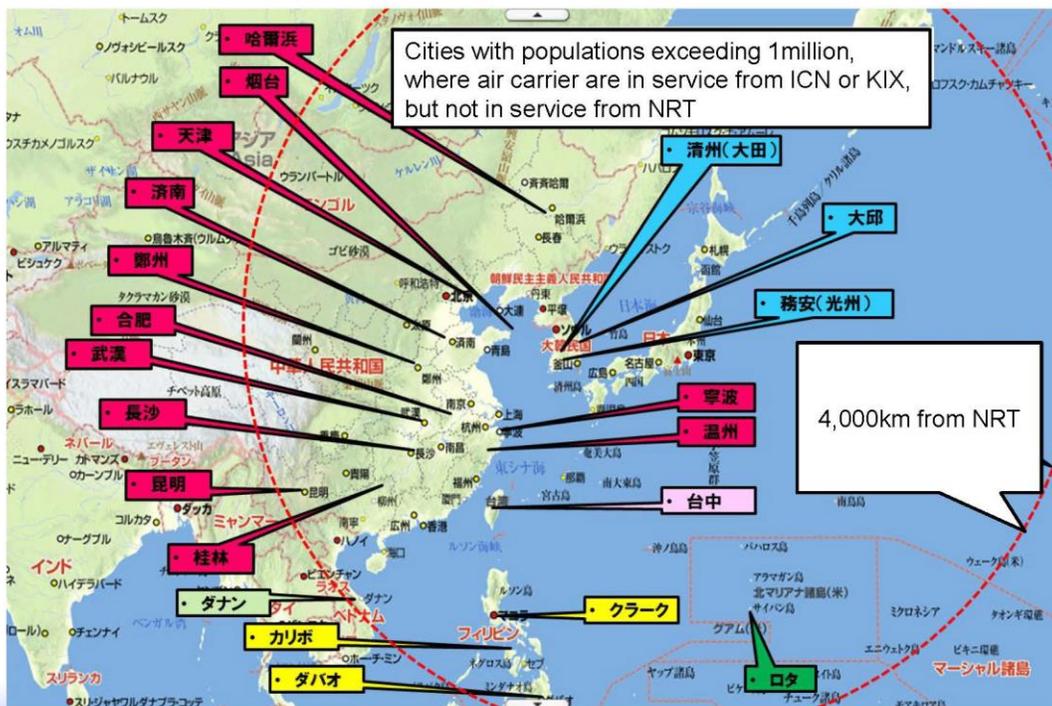
- ✓ Network expansion to/from China and Southeast Asia
- ✓ To maintain our network to/from North America
- ✓ Improved comfort and convenience for transit users

### → Meeting hub requirements of the LCCs

### → Strengthen our competitiveness



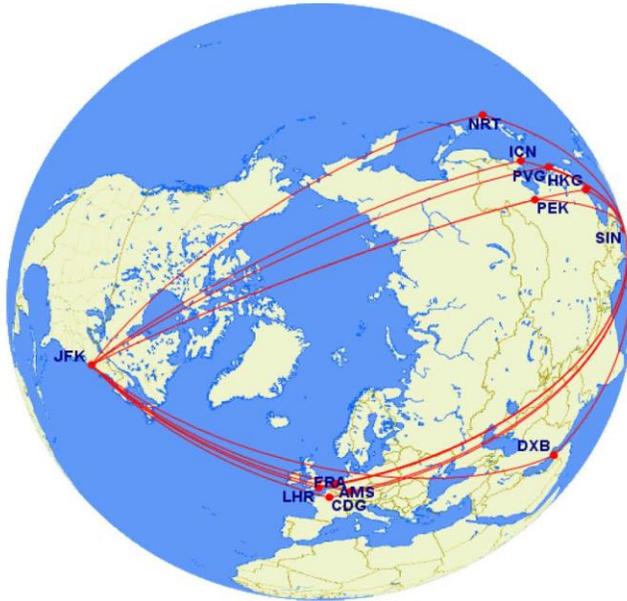
## Narita's Target (Chinese Market)



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## Connecting Point (East Coast USA)



□ Singapore (SIN) ~ New York (JFK)

Connecting point		Distance (Mile)
Direct		9,537
Asia	Narita (NRT)	10,069
	Incheon (ICN)	9,773
	Hong Kong (HKG)	9,660
	Beijing (PEK)	9,618
	Shanghai (PVG)	9,750
Europe	Amsterdam (AMS)	10,179
	Frankfurt (FRA)	10,246
	Paris (CDG)	10,302
	London (LHR)	10,217
Middle East	Dubai (DXB)	10,482

□ Asia ⇒ New York (JFK)

Connecting point	No. of Pax (Thousand)			
	2002	2007	2012	
全体	1,077	1,309	1,659	
Asia	Narita (NRT)	210	93	105
	Incheon (ICN)	98	86	86
	Hong Kong (HKG)	37	61	108
	Beijing (PEK)	3	33	48
	Shanghai (PVG)	0	7	44
Europe	Amsterdam (AMS)	9	5	5
	Frankfurt (FRA)	39	39	37
	Paris (CDG)	18	8	26
	London (LHR)	113	113	68
Middle East	Dubai (DXB)	18	73	109

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## Connecting Point (West Coast USA)



□ Mumbai (BOM) ~ Los Angeles (LAX)

Connecting point	Distance (Mile)
Direct	8,709
Narita (NRT)	9,674
Incheon (ICN)	9,445
アジア Hong Kong (HKG)	9,918
Beijing (PEK)	9,213
Shanghai (PVG)	9,635
欧州 Amsterdam (AMS)	10,168
Frankfurt (FRA)	9,892
Paris (CDG)	10,020
London (LHR)	9,943
中東 Dubai (DXB)	9,537

□ Asia ⇒ Los Angeles (LAX)

経由地	No. of Pax (Thousand)		
	2002	2007	2012
全体	1774	1988	2103
アジア Narita (NRT)	237	195	230
Incheon (ICN)	170	109	176
アジア Hong Kong (HKG)	57	118	86
Beijing (PEK)	14	47	41
Shanghai (PVG)	30	22	36
欧州 Amsterdam (AMS)	2	3	3
Frankfurt (FRA)	4	23	10
Paris (CDG)	1	2	3
London (LHR)	6	15	17
中東 Dubai (DXB)	3	4	47

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# Terminal Capacity Expansion Plan

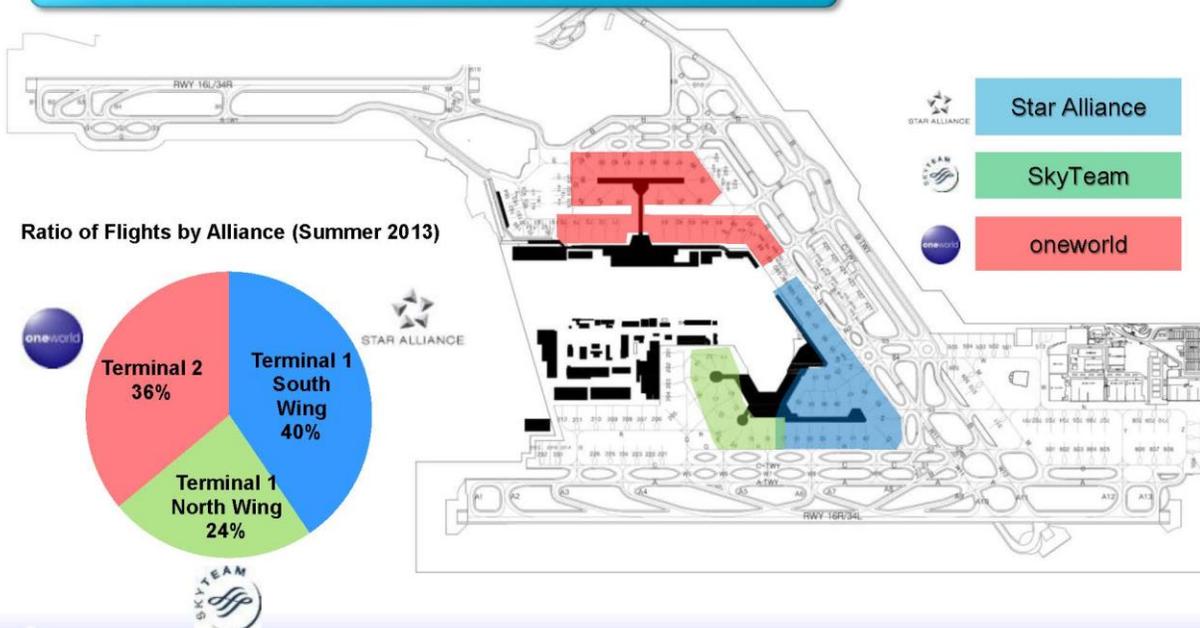
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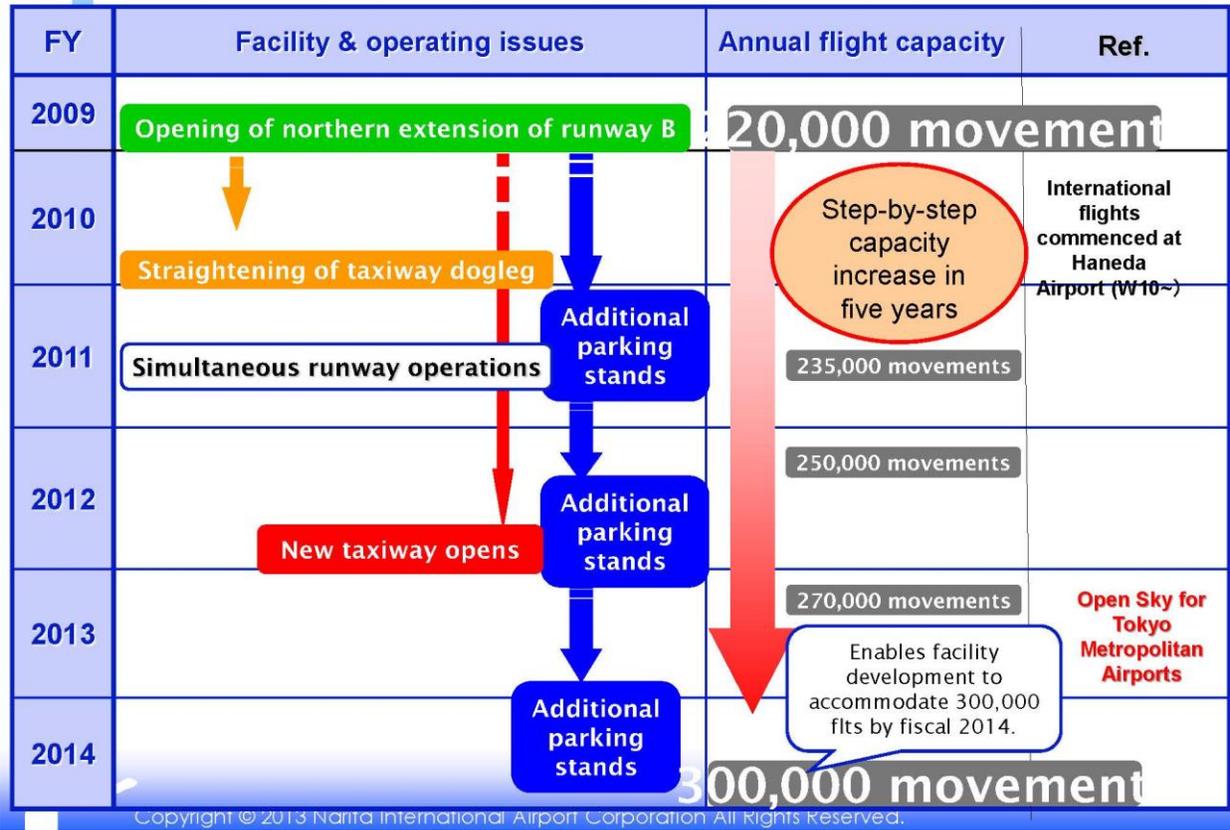
## Airline Allocation in the Passenger Terminals

Basically, each alliance uses a separate terminal

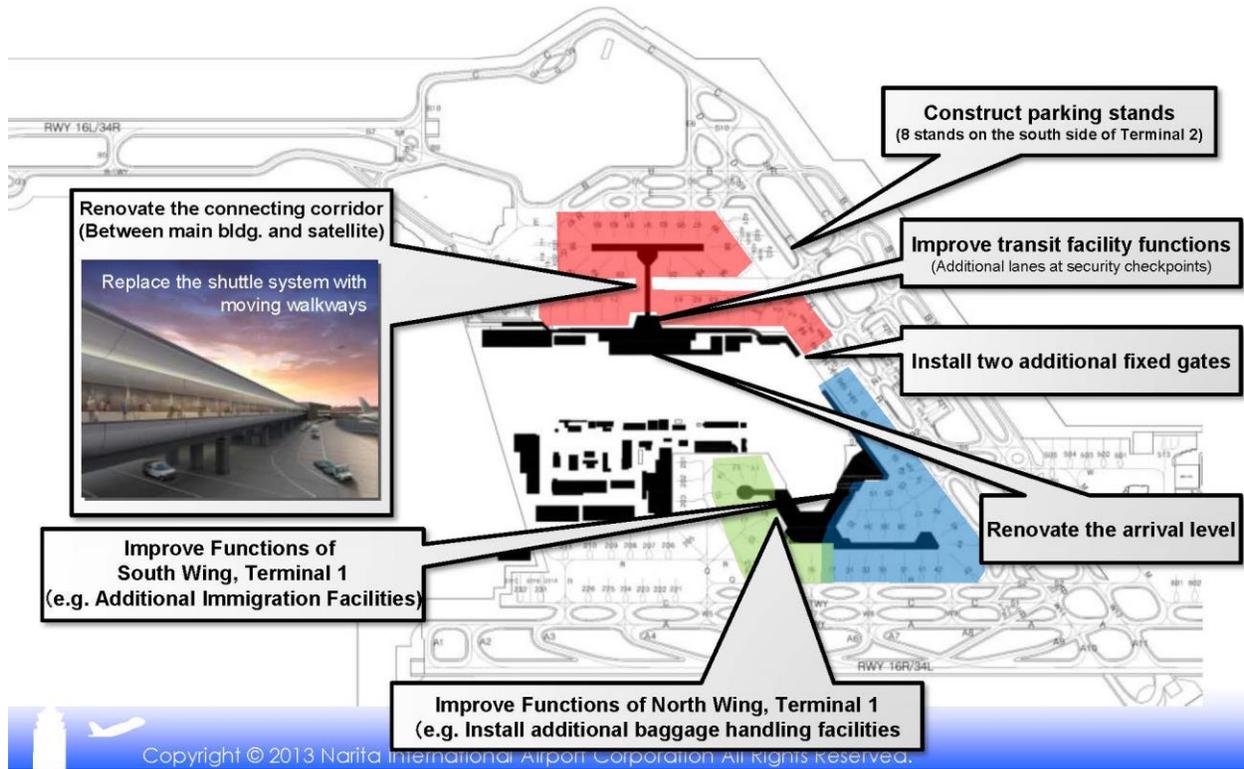


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## Airport Capacity Increase and Road ahead



## Functional Improvements to Existing Terminals



## Construction of a dedicated LCC terminal

LCC Terminal Completion by End of FY2014

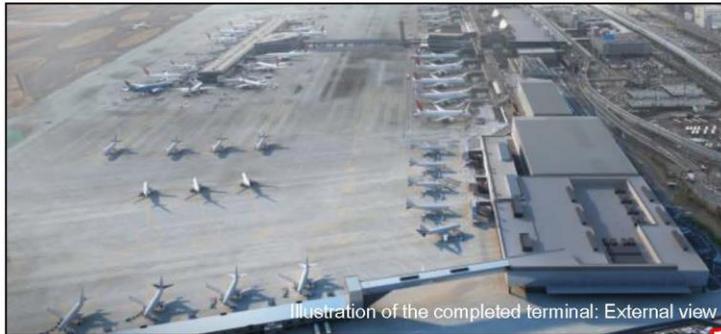


Illustration of the completed terminal: External view

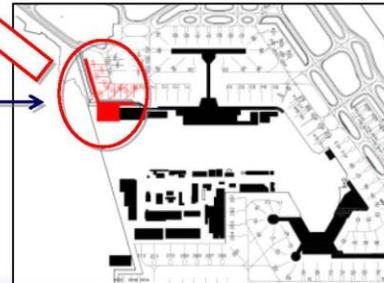


Illustration of the completed terminal: Departure lobby

### Outline of the LCC Terminal Project

Passengers: Approx	7.5 million p.a.
Aircraft movements	Approx. 50,000 p.a.
Floor space	50,000m <sup>2</sup> - 60,000 m <sup>2</sup>
Levels	Main Building 3 levels Satellite 2 levels
Bridge between main bldg. and satellite : 4th floor	

Viewed from  
this angle



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# Fast Travel

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## Simplifying the Business (StB)

- StBとは、IATAが推進している「航空旅行における手続きの簡素化を実現させるための取組み」である。
- その取組みの一つとして、「ファストラベル(セルフサービス)プログラム」がある。

### ファストラベル(セルフサービス)プログラム



ファストラベルの促進にあたり、航空会社は「上段の全プロジェクト」と「下段のうち最低でも1プロジェクト」を実施することを決定した。

### ファストラベルの導入状況

NRT  
MARTIA, Japan

Carrier	Alpha Color	Check-in	Bag Ready	Document Check	Flight Re-booking	Self Boarding	Bag Recovery
AA American Airlines	None	Green	Green	Green	Green	Green	Green
AZ Alitalia	None	Green	Green	Green	Green	Green	Green
BA British Airways	None	Green	Green	Green	Green	Green	Green
CA China Airlines	None	Green	Green	Green	Green	Green	Green
CG Cathay Pacific Airways	None	Green	Green	Green	Green	Green	Green
CI China Southern	None	Green	Green	Green	Green	Green	Green
CK Korean Air	None	Green	Green	Green	Green	Green	Green
GA Garuda Indonesia	None	Green	Green	Green	Green	Green	Green
HL Hanjin	None	Green	Green	Green	Green	Green	Green
KE Korean Air	None	Green	Green	Green	Green	Green	Green
JL Japan Airlines International	None	Green	Green	Green	Green	Green	Green
MH Malaysia Airlines	None	Green	Green	Green	Green	Green	Green
MS Egyptian	None	Green	Green	Green	Green	Green	Green
MS China Eastern	None	Green	Green	Green	Green	Green	Green
NX Air Mexico	None	Green	Green	Green	Green	Green	Green
OE Air New Zealand	None	Green	Green	Green	Green	Green	Green
OZ All Nippon Airways	None	Green	Green	Green	Green	Green	Green
PH PAL	None	Green	Green	Green	Green	Green	Green
PR Philippine Airlines	None	Green	Green	Green	Green	Green	Green
QF Qantas Airways	None	Green	Green	Green	Green	Green	Green
S7 S7 Airlines	None	Green	Green	Green	Green	Green	Green
TN Air Tahiti Nui	None	Green	Green	Green	Green	Green	Green
UL Sri Lanka Airlines	None	Green	Green	Green	Green	Green	Green
UN TransAsia Airways	None	Green	Green	Green	Green	Green	Green
VA Vietnam Airlines	None	Green	Green	Green	Green	Green	Green
XK Hong Kong Airlines	None	Green	Green	Green	Green	Green	Green

成田においては、必須プロジェクトである「手荷物預け」でセルフサービスが導入されていないため、「未整備(Red)」との評価を受けている。

### IATAからのコメント

- エアラインは自動化を促進したいと考えている。(NHは中部においてセルフバックドロップをトライアル中、JLは羽田においてセルフバックドロップのトライアルを検討、LHは成田において自宅で印刷した手荷物タグの導入を検討中。)
- 航空会社による自動化を促進していくためにも、NAAは航空会社をサポートする必要がある。
- 保安当局に対しキオスクや自宅で印刷した手荷物タグの導入について理解を求めたり、手荷物タグを印刷できるキオスクを導入したり、自宅で印刷した手荷物タグを入れるためのプラスチックホルダーを旅客に提供することが考えられる。

## Fast Travel

- ヨーロッパの空港においては、ファストトラベルの導入が進んでいる。
- 一方、アジア諸国や米国の空港においては、ファストトラベルの導入が進んでいない。

### 全プロジェクト導入済み空港 (Gold)

<b>LHR</b> LONDON HEATHROW, United Kingdom	Airport Color <b>Gold</b>	Fast Travel Compliant Airlines <b>4</b>
<b>FRA</b> FRANKFURT INT'L, Germany	Airport Color <b>Gold</b>	Fast Travel Compliant Airlines <b>1</b>

### 3プロジェクト導入済み空港 (Green)

<b>CDG</b> PARIS CDG, France	Airport Color <b>Green</b>	Fast Travel Compliant Airlines <b>3</b>
<b>AMS</b> SCHIPHOL AIRPORT, Netherlands	Airport Color <b>Green</b>	Fast Travel Compliant Airlines <b>5</b>

### ファストトラベル 未整備空港 (Red)

<b>SFO</b> SAN FRANCISCO INTERNATIONAL, United States of America	Airport Color <b>Red</b>	Fast Travel Compliant Airlines <b>0</b>
<b>LAX</b> LOS ANGELES INT'L, United States of America	Airport Color <b>Red</b>	Fast Travel Compliant Airlines <b>0</b>

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## What can we do?

### サポート案

- ✓ CUSSやセルフドロップシステムなどの設置 → コスト負担と回収について要検討
- ✓ 利用促進 → Webチェックインなどに対するインセンティブの提供  
例：電子搭乗券などへのクーポン券の発行など



KLM E-Ticket

### 「電子搭乗券などへのクーポン券の発行」

- 2013年1月より、KLMのオンラインチケットに広告を掲出している。
- 広告枠に成田空港で利用できるクーポン等を掲出することによって、お客様がオンラインチェックインを利用しようとするモチベーションにつながる。

2012 Summer	E-Service Check-in Kiosk	E-Service Check-in Web	Full Service Check-in
DL	39%	9%	52%

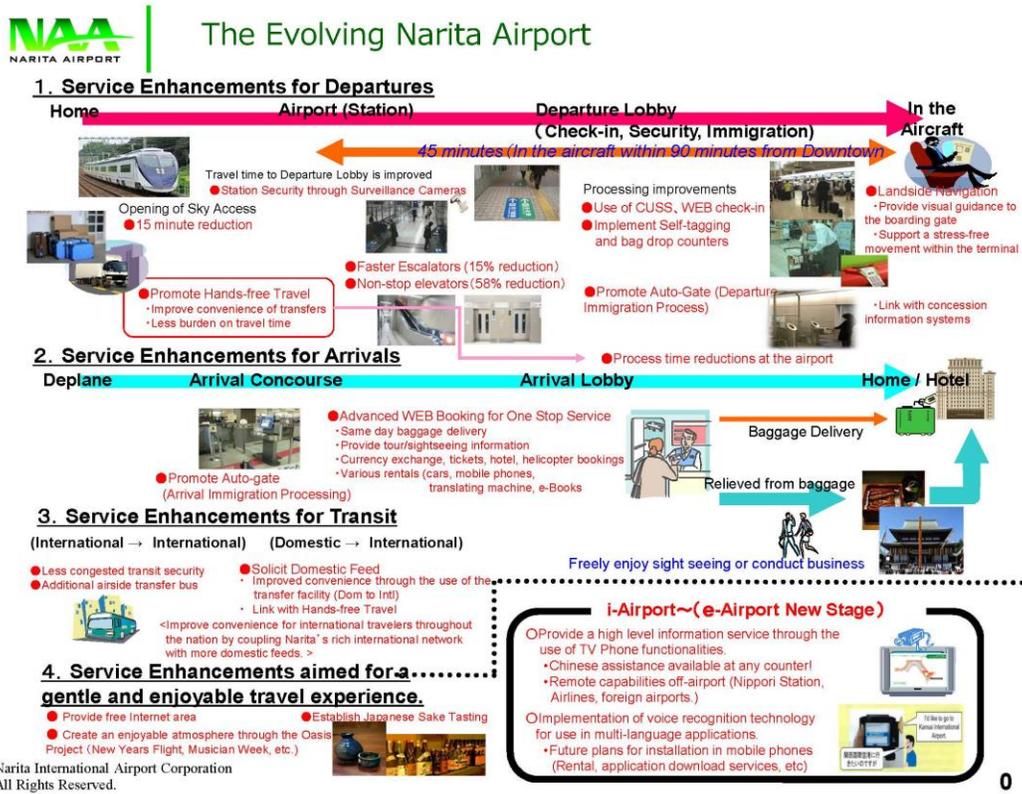
向上を目指す！



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# ATTACHMENT 5

## The Evolving Narita Airport Service Enhancement Map



**ACRP**

**Project 10-17**

**Implementing Integrated  
Self-Service at Airports**

**Task 3a:**

**Case Study Report #1b**

**Japan Airlines (JAL)**

TRANSPORTATION RESEARCH BOARD  
NAS-NRC

Submitted by:

**Barich, Inc.**

## INTRODUCTION

This Case Study Report (Report) documents the findings of the case study with Japan Airlines (JAL). This Report contains the information collected during the site walks, presentations, and discussions with the JAL delegates. Relevant documents collected during the Case Study are included as Attachments to this Report. Although detailed analysis of the information collected will be conducted in a later task, the following preliminary analysis is provided to present relevance to the overall project objective.

The information contained herein is crucial for the development the framework for the Guidebook, especially the final section “Key Highlights/Take-Aways”, which highlight very valuable information and proposes specific areas where information will continue to be assimilated for use with the Guidebook.

## BACKGROUND

### Entities/Location/Attendance

The Case Study was conducted at the offices of JAL, located at Haneda Airport (HND) from 9:00 AM to 5:00 PM on April 7. The Agenda for the Case Study is included as Attachment 1. Research Team Members conducting the Case Study were Justin Phy (Principal Investigator) and Frank Barich (Lead Researcher). The JAL Delegates that participated in the Case Study were Shuhei Kanayama (Strategy and Planning, Passenger Systems) and Hideyuki Isomura (Manager, Strategy and Planning, Passenger Systems).

The JAL Sponsor, Mr. Shuhei Kanayama also participated during the April 8 Case Study (see Report 1a) conducted at Narita Airport (NRT) with the Narita Airport Company (NAA).

### Case Study Objectives

Based on secondary research on JAL, as well as an initial phone interview with and preliminary survey responses by the NAA Sponsor, the Team discovered useful information and valuable opportunities which identified JAL as strong case study subjects in addition to the NAA. Therefore, this case study entails the following objectives:

- Understand as best as possible, the process in which an airport or airline chooses to introduce passenger self-services
- Evaluate the basis behind the planning and implementation of specific self-services
- Document the means in which the airport or airline measures the benefit of self-services, including discussing cost consideration affecting self-service initiatives.
- Understand the integrated components that may exist between the services, and the collaboration opportunities between airport and airline(s)
- Get a better understanding how social media supports self-services



- Inquire about future self-service initiatives, either planned or considered

## Research Approach

To meet the objectives, the Team had compiled a series of comprehensive worksheets and preparation documents designed to help facilitate the flow of meetings and collection of information. This documentation was discussed and sent to the case study coordinator prior to the actual on-site visit.

Once on site, the Research Team engaged with the JAL delegates during a variety of meetings and workshops, which included presentations, discussions, and interviews. In addition, an airport site walk was conducted to experience the self-service efforts first hand.

## KEY HIGHLIGHTS/TAKE-AWAYS

This Case Study achieved very valuable results for the development of the project Guidebook.

### QuiC

JAL recognizes that their primary competition for Domestic Airline travel is the ‘Bullet Train’, where this train has made travel between Japanese cities quick, convenient, and on-time. In direct response to this competition, JAL introduced the QuiC program in 2005. QuiC is the “world’s first IC check-in and boarding” system and covers all 52 JAL domestic departure airports. Through the QuiC program, JAL is now accepting at-airport check-in up to 15 minutes prior to aircraft departure time; dramatically reducing the overall travel time a passenger goes through when using JAL. In 2013, JAL was recognized as the “world’s top performer for on-time arrival.” Further information regarding the QuiC program is included in this Case Study Report in Attachment 2.

Understanding JAL’s methodology behind QuiC is important to this project, because it provides the fundamental basis for how the JAL plans for and tracks success regarding technology projects related to passenger self services.

### Passenger Services through an Integrated Mobile Strategy

The NAA provided a detailed discussion on the approach to their Passenger Self-Services Mobile Strategy Planning process. The Figure 1 illustrates the various touch points at which JAL is deploying the mobile strategy. Attachment 3 provides background information on the JAL mobile strategy planning approach.



Understanding JAL’s methodology behind the mobile strategy is important to this project, because it helps to assess how IT initiatives integrate with each other, to improve the overall passenger process.

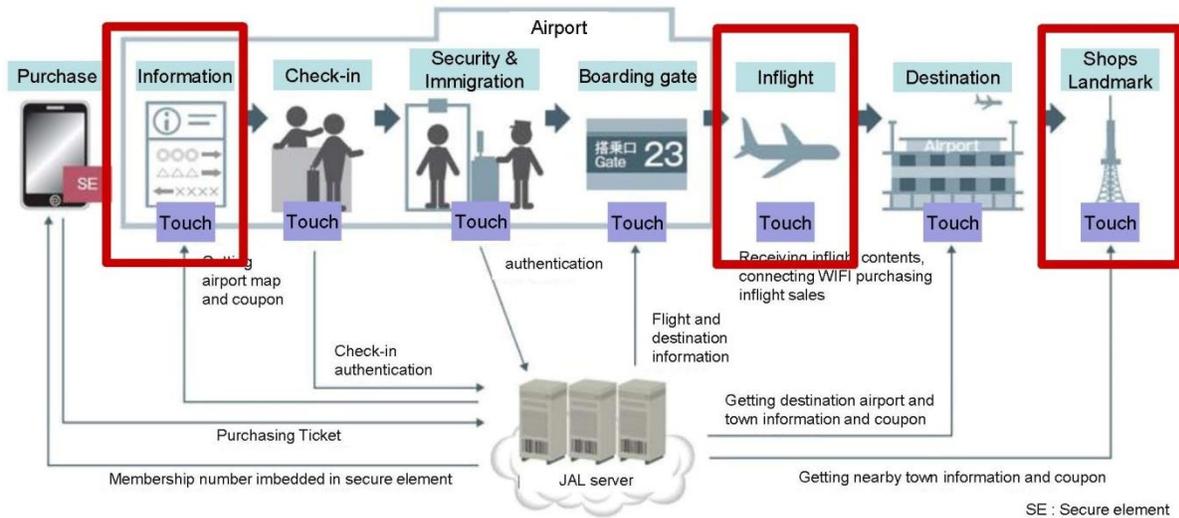


Figure 1. JAL Mobile Strategy – Touch Points

### Improving the Self Service Check-in Process

JAL provided a detailed discussion on the check-in process. For JAL airport check-in through self-service kiosks remains a vital link in the overall passenger process. As such, JAL continues to improve the check-in process by reducing the time a passenger takes at the self service kiosk. JAL ensures that the time it takes to advance between screens remains under 1 second for all screen changes.

Understanding JAL’s methodology behind this evolving process is important to this project, because it helps to assess how measuring IT initiatives at all levels is important to the success of the Passenger Self-Service program. Attachment 4 provides background information on the JAL Kiosk planning strategy.

### Site Walk of Haneda Airport

JAL hosted a site walk of the Haneda airport, as it related to their passenger check-in and boarding process. During the site walk, the Research Team discussed various initiatives to better understand JAL’s approach to passenger self-services. Figure 2 shows the overall processes viewed during the site walk.

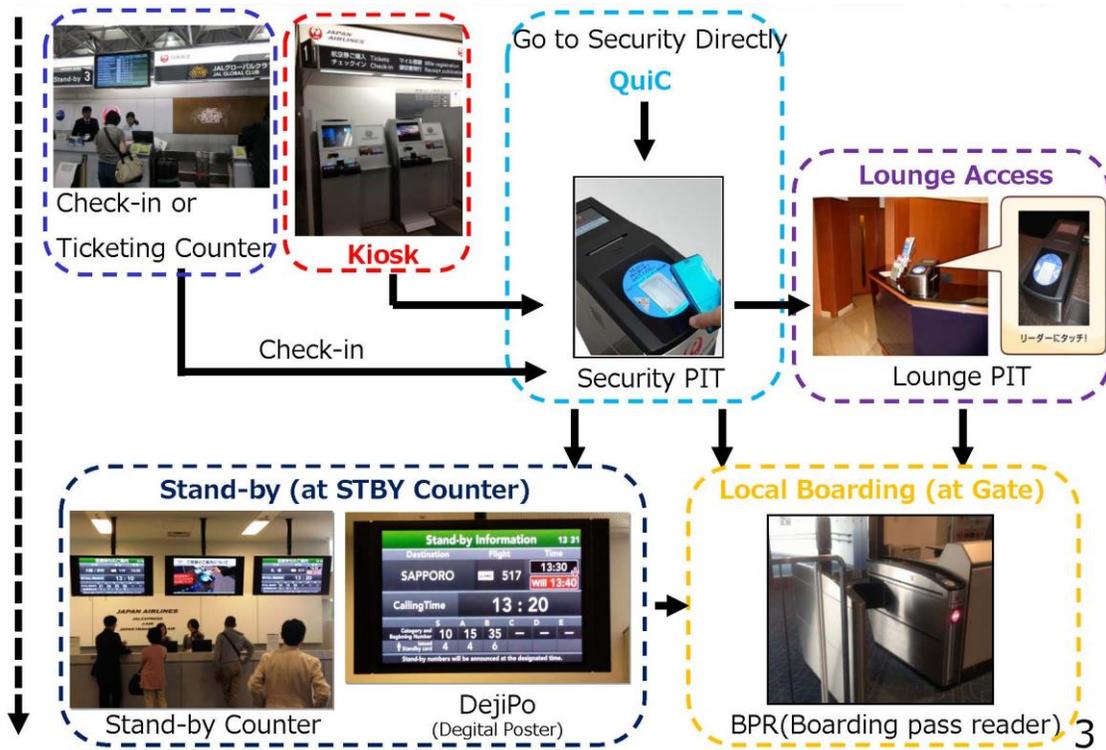


Figure 2. JAL Passenger Stream at Hareda Airport

The Research Team also witnessed an extremely efficient boarding process, where by using self-service boarding gates, JAL boarded a 777 in under 12 minutes. Attachment 5 provides a sampling of the photographs taken during the site walk.

## ATTACHMENT 1

### Case Study Agenda

Time	Content
7 April Mon	
09:50	<u>Assemble with JAL staff</u> <i>Assemble point : In front of #1 clock tower between the security gate A and B in the south wing of Terminal 1.</i>
10:00	<u>Arriving at the meeting room in JAL Haneda office</u>
10:10 – 10:20	<u>Overview of ACRP 10-17 Case Study by Mr. Frank Barich</u>
10:20 – 11:00	<u>Introduction to Self-Service of JAL for Domestic: QuiC &amp; Kiosk by Shuhei Kanayama</u>
11:00 – 12:30	<u>Meeting 1:</u> <u>Self-Services at the each Passenger Journey Point</u>
12:30 – 13:00	<u>Meeting 2:</u> <u>Social Media</u>
13:00 – 14:30	<u>Lunch Break</u>
14:30 – 15:35	<u>Airport Tour (details below)</u>
14:30 – 14:55	<u>Demonstration of Kiosk (Ticketing &amp; Check-in with upgrade)</u>
14:55 – 15:05	<u>Demonstration of Streamlined Process and QuiC at the Security Gate</u>
	--- Entering Airside ---
15:05 – 15:10	--- Move to the Boarding Gate ---
15:10 – 15:35	<u>Observe the Self-Boarding</u> ✧ 15:10 - Boarding Start of JL125 Tokyo – Osaka (B777-200) ✧ 15:30 - All on Board
	--- Back to Landside ---
15:40	Finish site visit
8 April Tue	Case study with NAA at NRT



## ATTACHMENT 2





# Innovative boarding process in Japan

## –Competition against 'bullet train'–

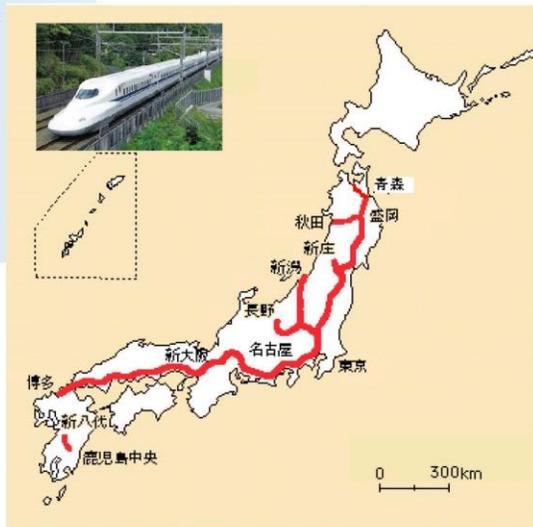
**Shuhei Kanayama**  
Strategy and Planning, Passenger Systems, Japan Airlines

<http://www.jal.co.jp/>



1

# Origin and Destination



•Huge traffic in Honshu (main) island

- |                 |          |
|-----------------|----------|
| Osaka           | Yamagata |
| Okayama         | Akita    |
| Hiroshima       | Misawa   |
| Ube             | Aomori   |
| Kita-Kyushu     |          |
| Fukuoka(Hakata) |          |

2

## World's No.1 punctuality



Thank you for your cooperation for on-time operations. 

**JAL was named the world's most punctual airline in the Major International Airlines and Asia-Pacific Major Airlines and JAL Group in Major Airline Network.**

**Recognized as the world's top performer for on-time arrival in 2013.**

FlightStats, Inc examined on-time performance of 31 major airlines.  
JAL achieved on-time performance rate of 88.94% of its 129,000 flights operated, the top performance of major global airlines.

-  **World's No.1** on-time performance rate **88.94%** (2013)  
Major International Airlines For the Second Consecutive Year
-  **Asia-Pacific's No.1** on-time performance rate **88.94%** (2013)  
Asia-Pacific Major Airlines
-  **World's No.1** on-time performance rate **89.75%** (JAL Group 2013)  
Major Airline Network



In addition to that...



In addition to that...

- JAL accept check-in up to



-15min  
prior to STD

4

But...



'Bullet train' is more punctual.

- Train never wait for passenger.
- Possible to run into the cabin without any security check, No need to fasten seat belt, No ATC



5

## Market share

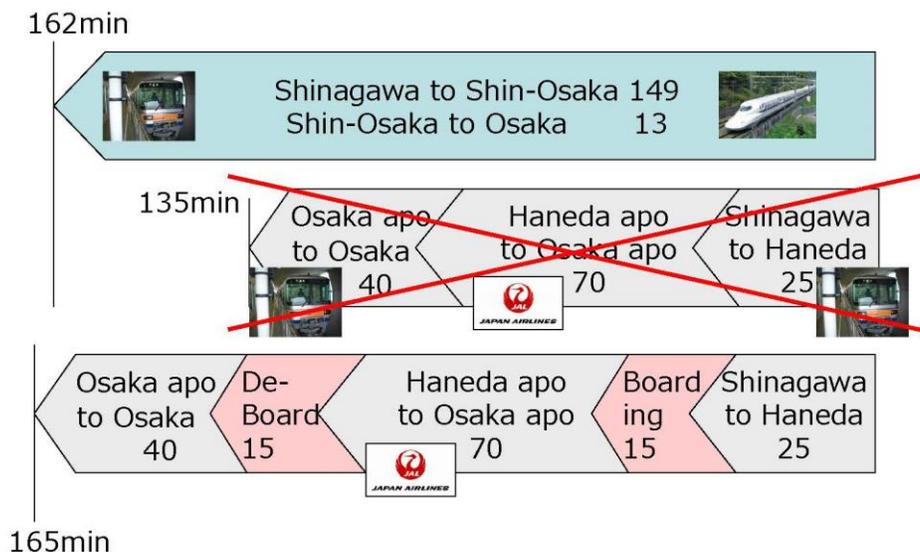


		
Tokyo-Osaka 510Km	150min    Share <b>84%</b>	70min    Share <b>16%</b>
		JL 16FLT    NH 15FLT
Tokyo-Fukuoka 1050Km	300min    Share <b>10%</b>	115min    Share <b>90%</b>
		JL 17FLT    NH 18FLT
Equipment	New model    270Km/h	Mainly B777 767

Time is Money... Fast travel make profit

6

## Detail of TYO-OSA case



- Boarding / De-boarding time is the key
- Hustle free boarding is highly mandated (No queue)

7

## Unique Requirement



- Many passengers show up to Haneda/Osaka/Fukuoka airport 30~20min prior to departure
- No positive ID check at boarding gate
- JAL dedicated equipment (not CUTE)
- Number of seats = 500 Max



8

## QuiC (Direct boarding style)



Branding = **QuiC**

Service started from 2005 Feb

The world's first 'IC check-in & Boarding'

Covers all 52 JAL domestic departure airports,

## QuiC (Direct boarding style) cont.



### Point1 : Boarding Token 4 types

2D (QR format) barcode on A4 paper



2D (QR format) barcode on mobile



IC chip in Frequent flyers card



IC chip in Japanese mobile phone  
JAL Apps downloaded



## QuiC (Direct boarding style) cont.



Point2 : No need Web Check-in => Touch & Go

だれでも簡単!



11



## QuiC (Direct boarding style) cont.



Point3 : Super fast self boarding



13

## QuiC (Direct boarding style) cont.



### Point4 : Functional spec

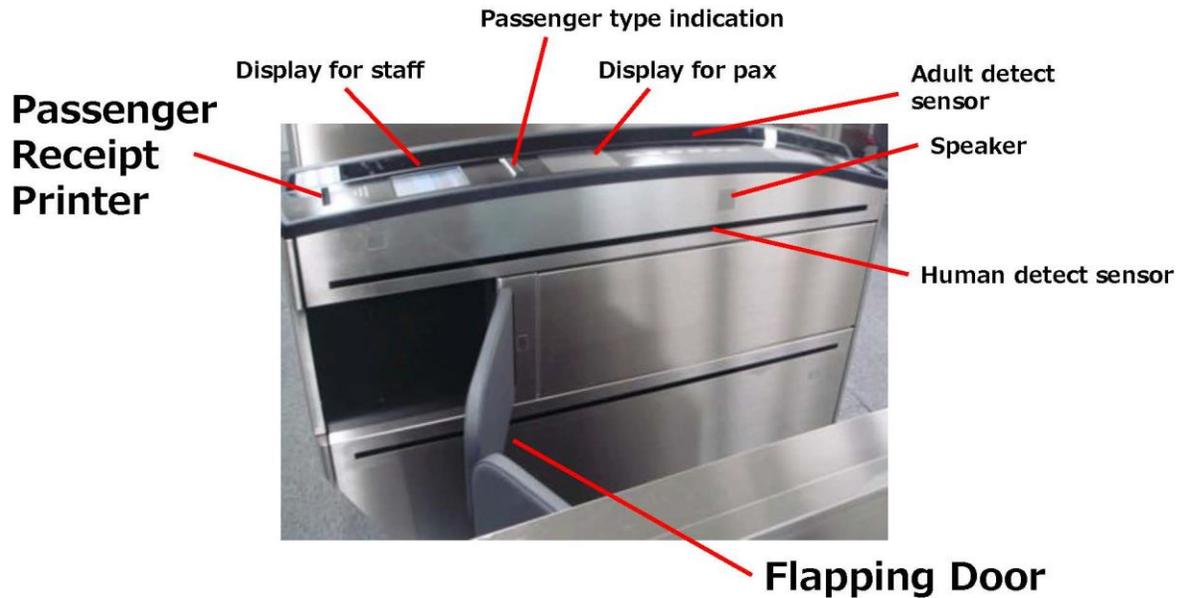


14

## QuiC (Direct boarding style) cont.



### Point4 : Functional spec



15



## About Types of IC



Available types of IC are...

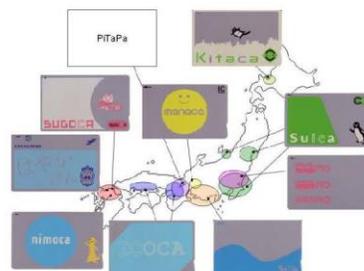
- Felica
- Mifare (Type-A)
- Type-B

=> QuiC service apply to Global standard !

But...

IC service in Japan has Felica in use, and it using NFC is still developing in Japan.

One reason is that the Felica is popularized as a usual tool for taking train.



17

## Mar 2014 TYO-OSA



		Numbers of Token	Ratio of Token	Self Scanning
IC	Mobile	5915	5%	Very good
			31%	Very good
QR (barcode)		6065	5%	Little difficult (back light)
		27030	21%	Little difficult (Positioning)
		49317	38%	Good
Total on board		128134	100%	18



## Key takeaway -Self Boarding-



- Improve competitiveness
- Reduce staffing cost
- User friendly equipment & Boarding token
- Total passenger flow



19

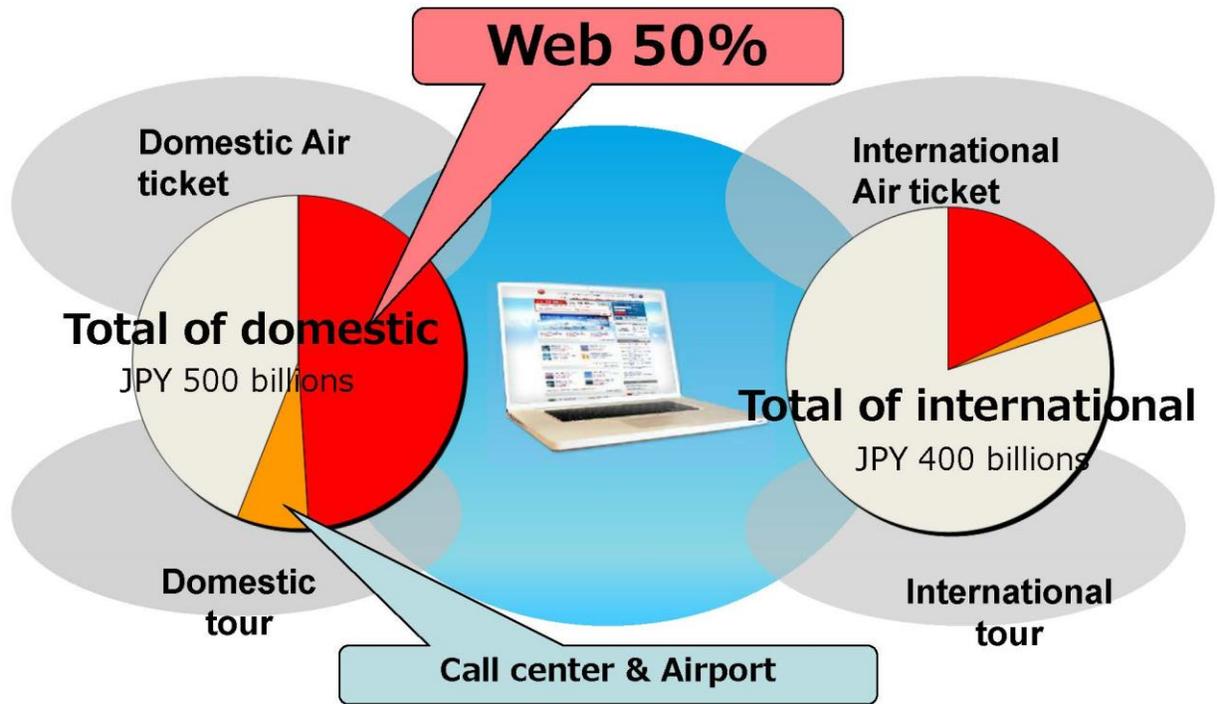
## ATTACHMENT 3



About JAL



## Air ticket sales rate through Web



Introduction



JAL Domestic Flight Sales from smart phone

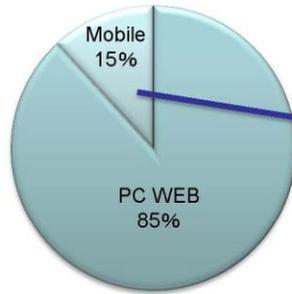


*\*individual market*

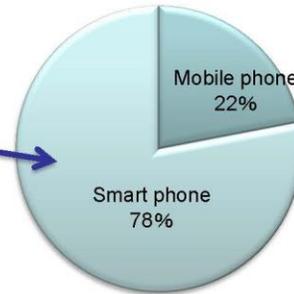
## Domestic sales



Domestic Air ticket Mobile vs. PC WEB



Domestic Air ticket Smart phone vs. mobile phone

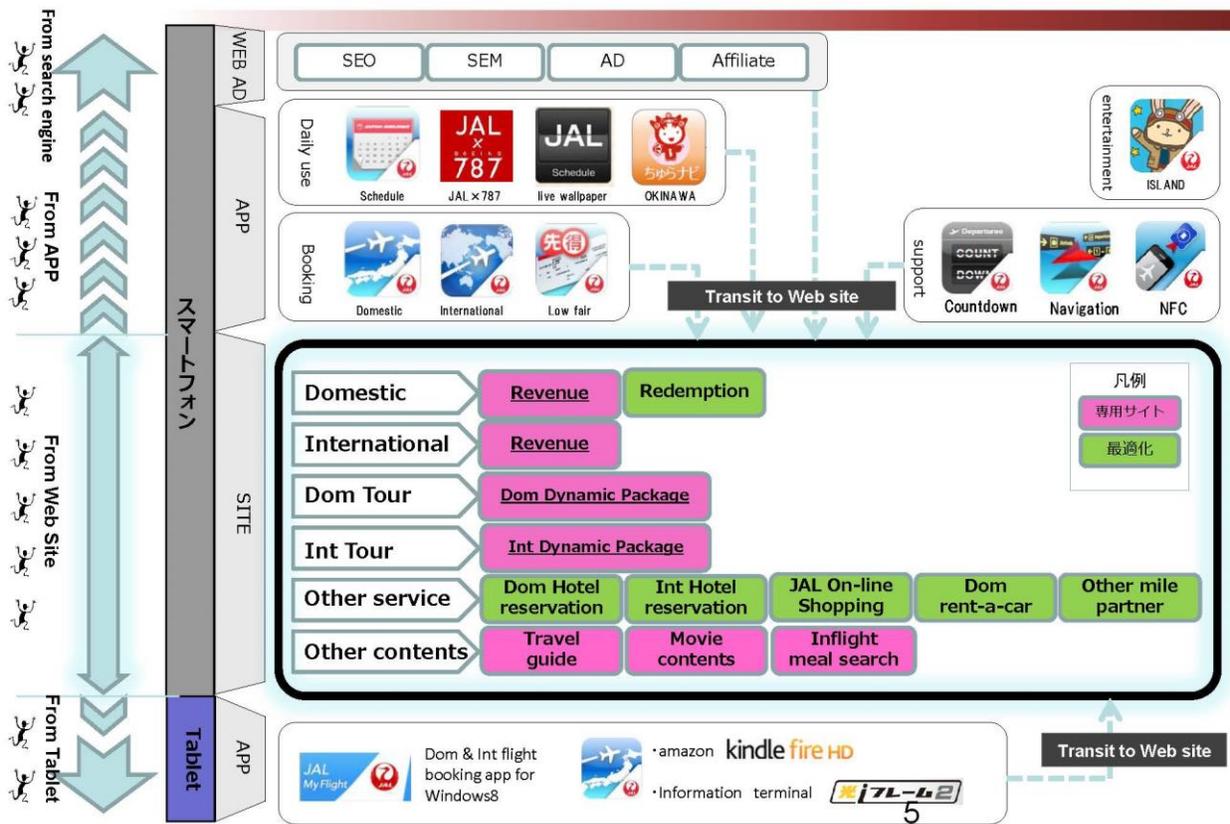


15m 150m

iPhone 40%

Android 60%

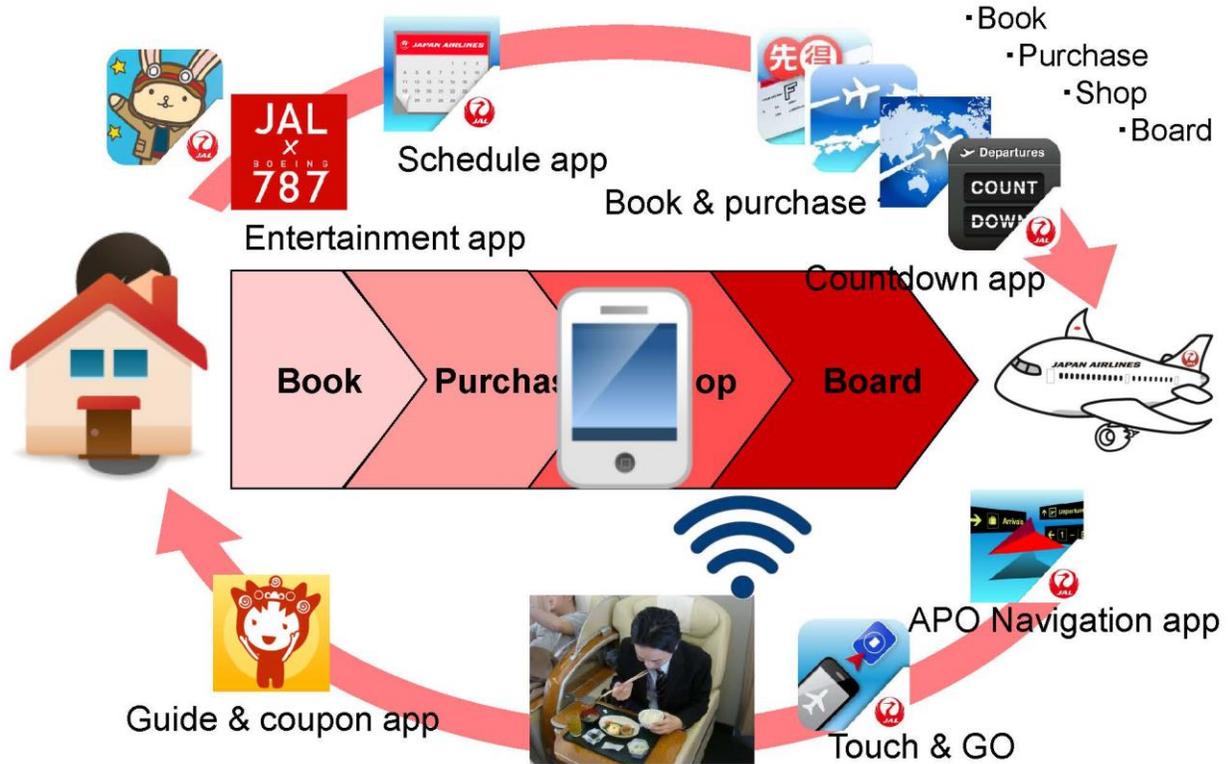
# Web site and App



## Traveling style



## Traveling style



JAL Schedule

iPhone Android

JAPAN AIRLINES



- Calendar App  
→sync with Google
- Event information around Japan  
→Information gathered by local JAL staff

8

JAL International iPhone  

 **JAPAN AIRLINES**



- International Ticket reservation  
All flight(include code share)  
All Class(F/C/Y)  
All Fair
- World clock  
11 different country with  
weather and currency  
information

JAL International iPhone     

 **JAPAN AIRLINES**



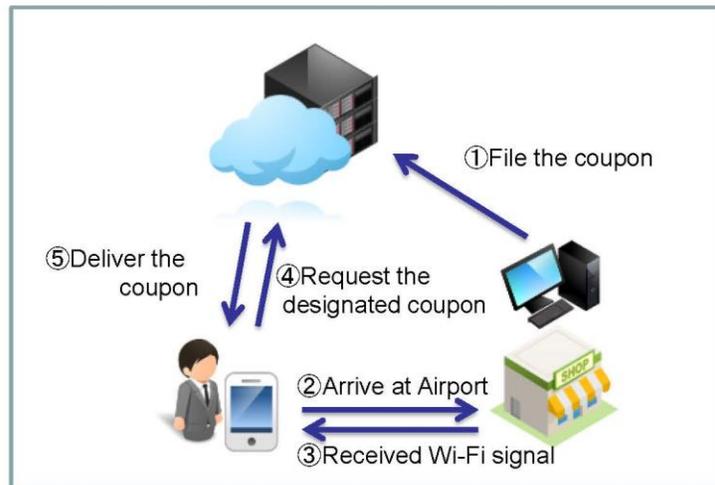
- Countdown the remaining time for the flight  
→JMB member will automatically retrieve the reservation  
→Guest member can also use it by setting the flight manually
- Display the latest flight status  
→sync with web information
- Sync with other App  
→Launch QR code for boarding  
→Launch navigation app to gate
- Real time information  
→Flight status information  
→Gate boarding status information

JAL International iPhone    

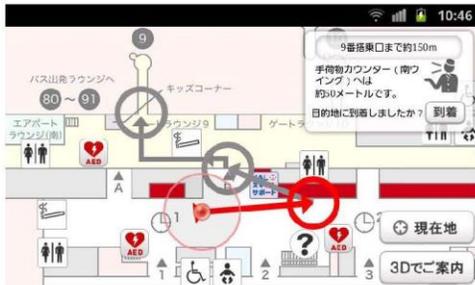
 **JAPAN AIRLINES**



- Shopping Coupon
- Location base
- No need to launch the app



## JAL AiRport navigation



- Navigate inside the HND airport  
→ 2D MAP mode and 3D AR mode  
→ From your position to your gate

- Airport facility  
→ smoking area, toilet, and other...



- Linked from countdown  
→ Countdown app will hand over your departure gate so the navigation will direct you automatically

JAL IC touch&go



JALタッチ&ゴサービスをご利用いただけます。



■ Tap & Go app for all IC smartphone  
→ Able to use at counter, security and gate

■ Capable with all type of NFC  
→ Type A / B and F



All App

iPhone 안드로이드

JAPAN AIRLINES



Common launcher  
→ Linked to all JAL app

## Single or Multiple app



		
Target device	For all device	According to each app purpose
Developing	One Developer	Multiple Developer
Testing	100% inspection	Only test the app you change
Promotion category	As travel app	Each app has it own assign category
Start & Close	Must coordinate with IT Dep.	DIY-Do It Yourself!

## QuiC navi



Summarize all information for your next flight



Boarding QR, and flight status. Able to upgrade by paying difference.



Live video feeds from all airport for weather check.



Live picture of security lane.

Dedicated for smartphone

## Passbook and Google now



Apple iOS Passbook



Google now

Android Google now



## JAL NFC SERVICE



Start in Feb 2005

FeliCa



TYPE F

- IC Boarding pass  
Security check  
Boarding gate
- IC Coupon  
Shop in Airport



## SERVICE AREA



Available in  
all Online Airport  
for Domestic Flight

## BOARDING GATE



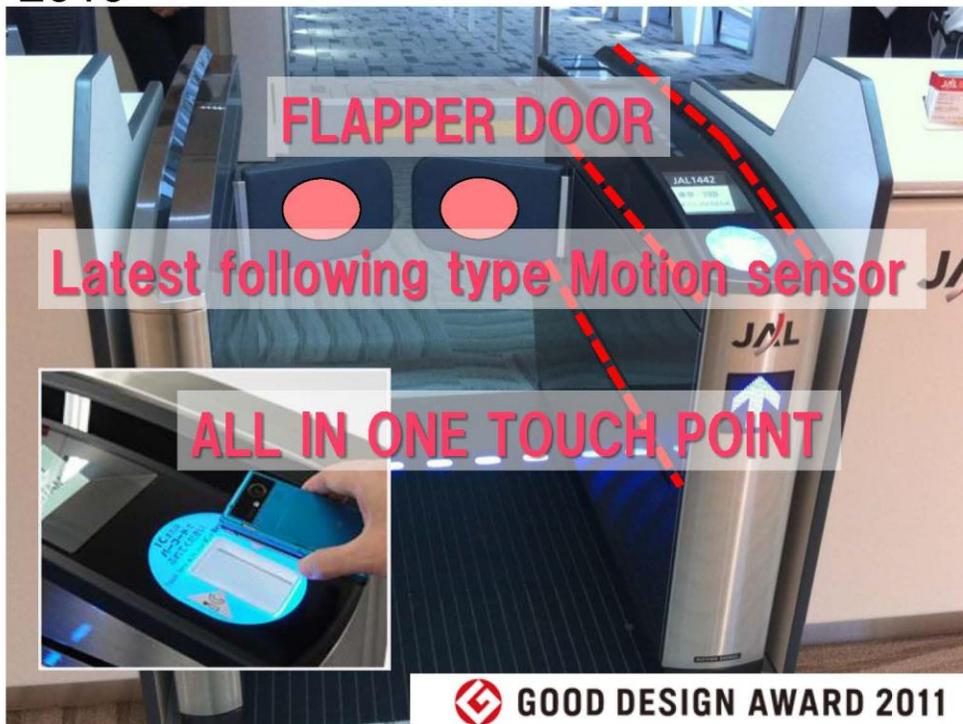
2005 ~ 2010



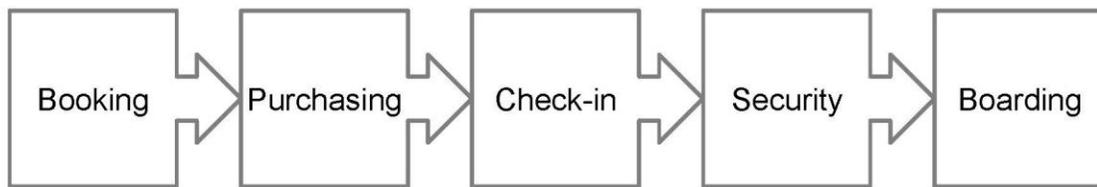
## BOARDING GATE



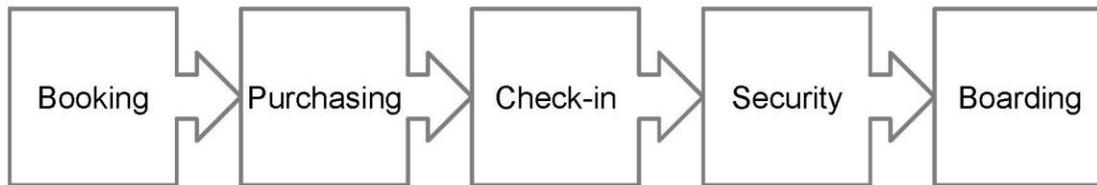
2010 ~



## Passenger Flow



## Passenger Flow



## IC and QV reader



## IC and QV reader



## IC and QC reader



## Traveling style



## NFC



))) NFC )))

## NFC Touch & Go

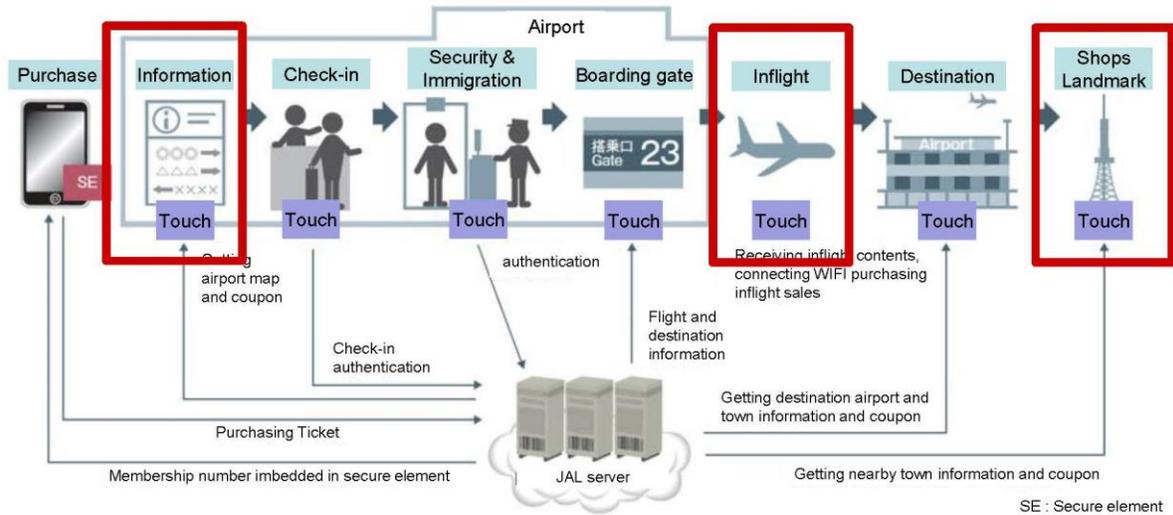


**Start from Sep 26 2012**

**Expand Felica touch & go service to  
NFC (TypeA/B) on smartphone**

**Currently available on KDDI frequency  
Will support other operator soon**

## Potential to use NFC



## ATTACHMENT 4





# Kiosk for Domestic Flight

**Shuhei Kanayama**

Strategy and Planning, Passenger Systems, Japan Airlines

1

## Background



- The main service of JAL domestic is QuiC (Direct Boarding Style)



But...

- There are some important services which QuiC cannot support (e.g. Change Flight, Upgrade etc)

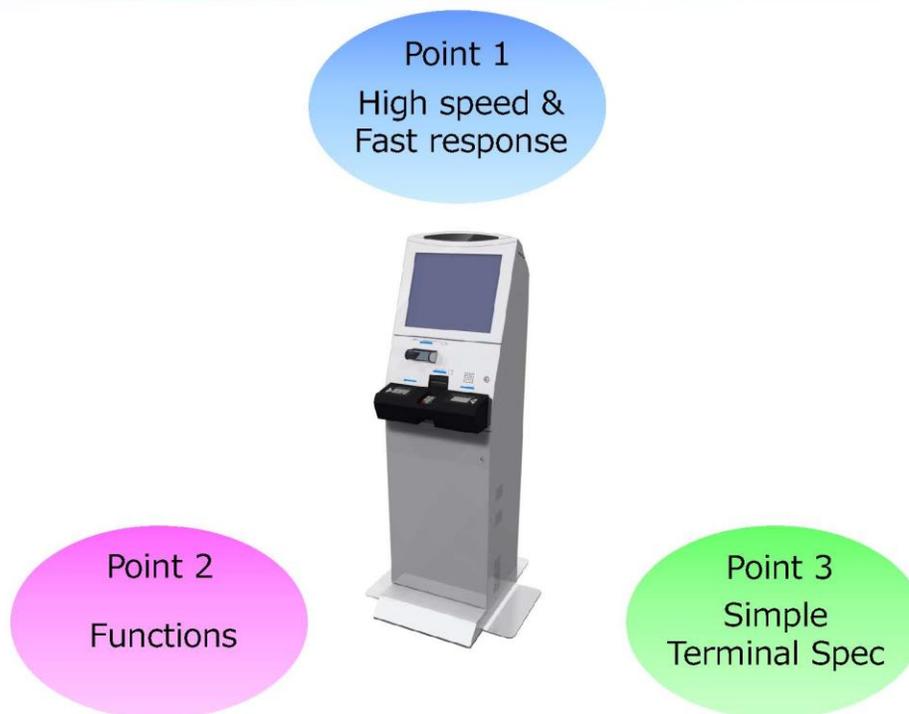


So...

- It is **JAL Domestic Kiosk** to complement those services !

2

## 3 Points of Kiosk



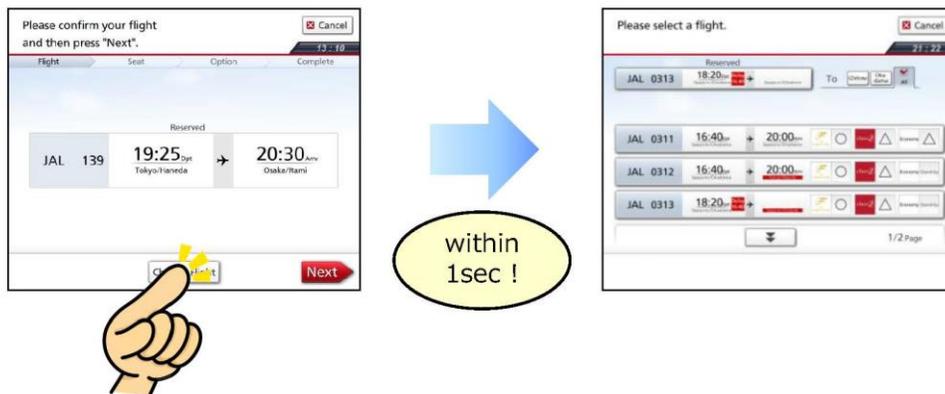
3

## Point 1 : Response



How fast is the response of Kiosk ?

=> It takes within 1.0sec to change to the next screen



4

## Point 2 : Functions



### What do we do by Kiosk ?

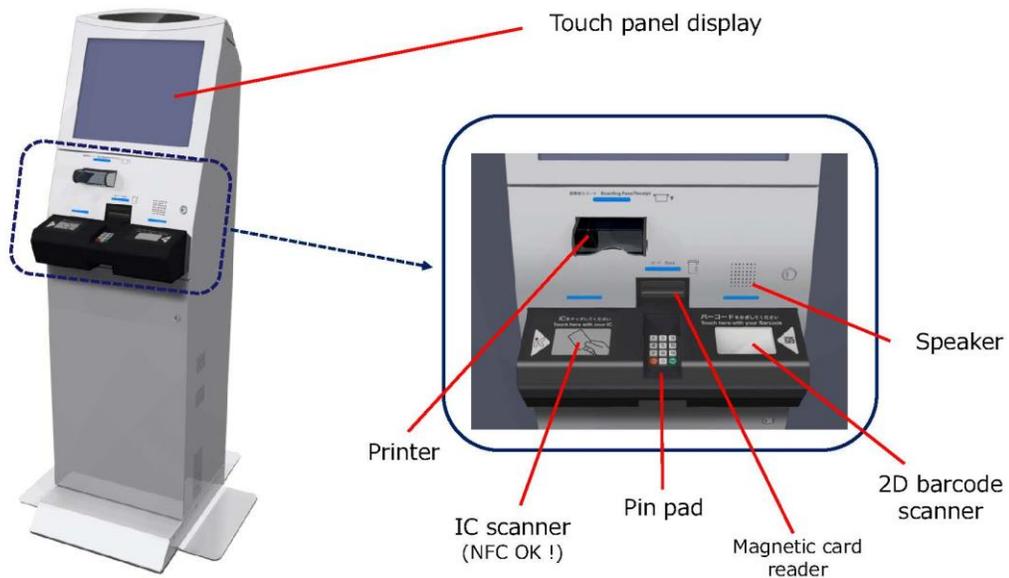
- Change Flight (same destination)
- Upgrade
- Stand-by
- Mile Registration
- Receipt Issue
- Ticketing with Create New Booking
- Ticketing with Existing PNRs

5

## Point 3 : Terminal Spec



This terminal is used in many airlines.  
(For JAL, some customization is carried out)



6

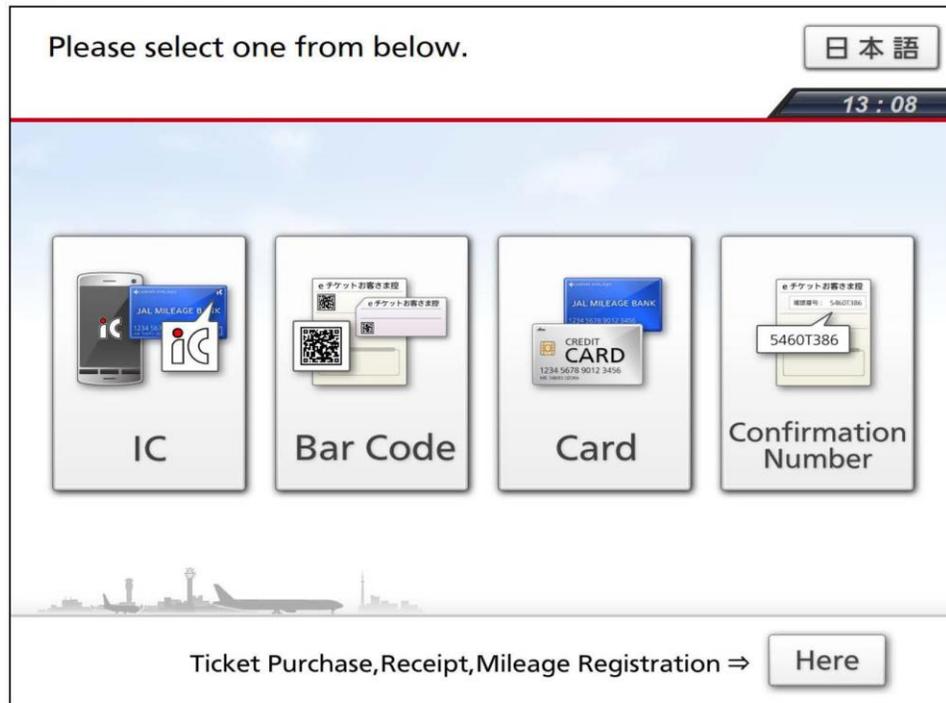


We will demonstrate some functions in airport tour.  
Please check its response and usability there !



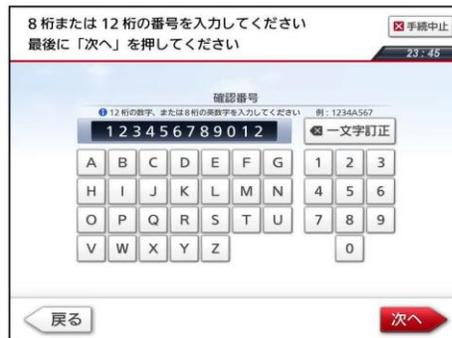
7

Sample Screen Flow : Upgrade with change flight



8

Input one of them to search passenger data



9

## Confirm passenger name(s)



Please confirm passengers in your party and then press "Next".

13:09

OOZORA/TABITO

OOZORA/HANAKO

Adult:2 + Infant:0

10

Select "Change Flight"



Please confirm your flight and then press "Next". Cancel

13 : 10

Flight > Seat > Option > Complete

Reserved

JAL 139 Economy	19:25 <sub>Dpt</sub> Tokyo/Haneda	→	20:30 <sub>Arrv</sub> Osaka/Itami
--------------------	--------------------------------------	---	--------------------------------------

Change Flight Next

11

Select desired flight



Please select a flight. Cancel

21 : 22

Reserved

JAL 0313 18:20 Depart Seaside/Okiadama → Seaside/Okiadama To Choose Okadama All

JAL 0311 16:40 Depart Seaside/Okiadama → 20:00 Arrive Seaside/Okiadama Economy

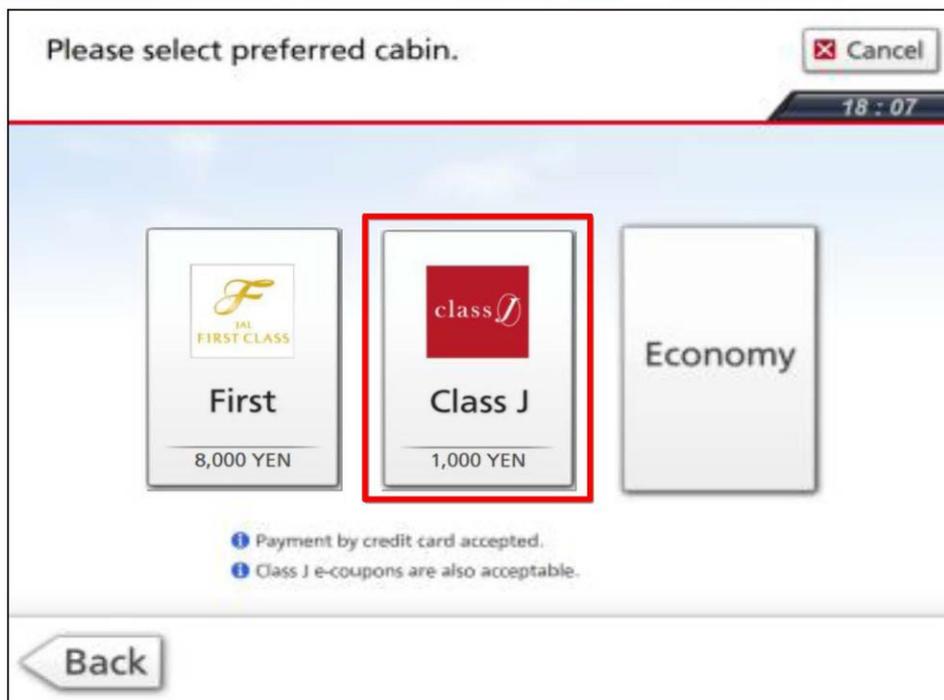
JAL 0312 16:40 Depart Seaside/Okiadama → 20:00 Arrive Seaside/Okiadama Economy Stand-by

JAL 0313 18:20 Depart Seaside/Okiadama → Seaside/Okiadama Economy Stand-by

1/2 Page

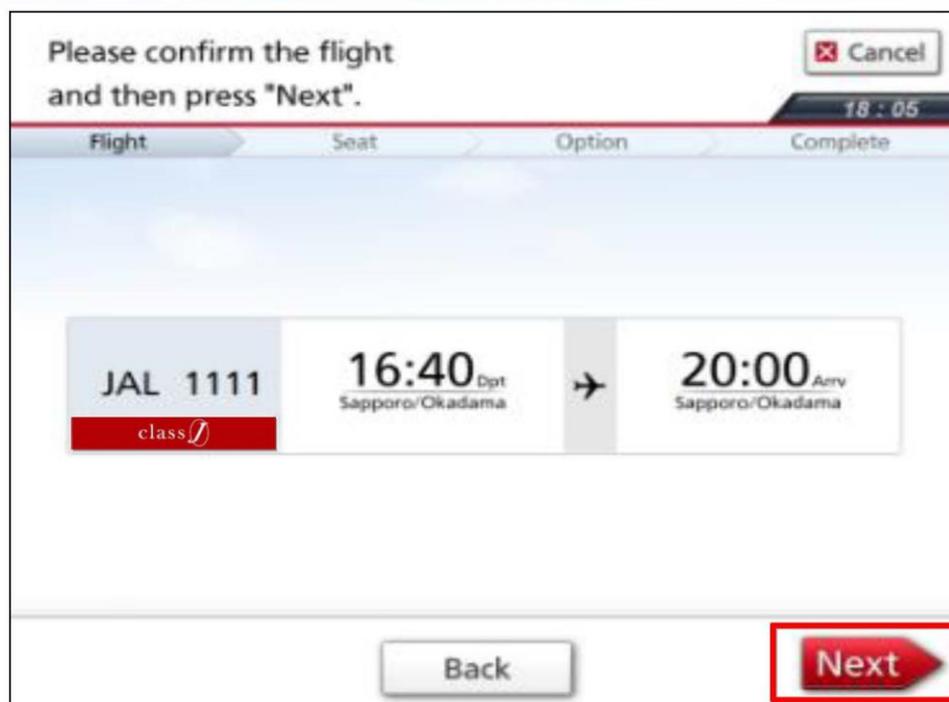
12

Select desired upper class



13

Confirm flight and class information



14

Select desired seat



Please select a seat and then press "Next".

Cancel 10:48

JAL 115 Tokyo Haneda 11:30 Osaka Kansai

0020RA/TAMETO 3D

0020RA/TAMENO 3E

0020RA/TSUBASA

Available

Available (With info)

Reserved/Confirmed

Checked-in

Checked-in (With infant)

Extra Leg Room

Pre-Reserved

5 6 7 8 9 10

A C D E F G H K

Back Change Seat Next

15

Confirm price information



Please pay the Class J fee.  
Credit card can be accepted.

10 : 49

OOZORA/TABITO	1,000 YEN
OOZORA/TABIKO	1,000 YEN
OOZORA/TSUBASA	1,000 YEN

Total Price 3,000 YEN

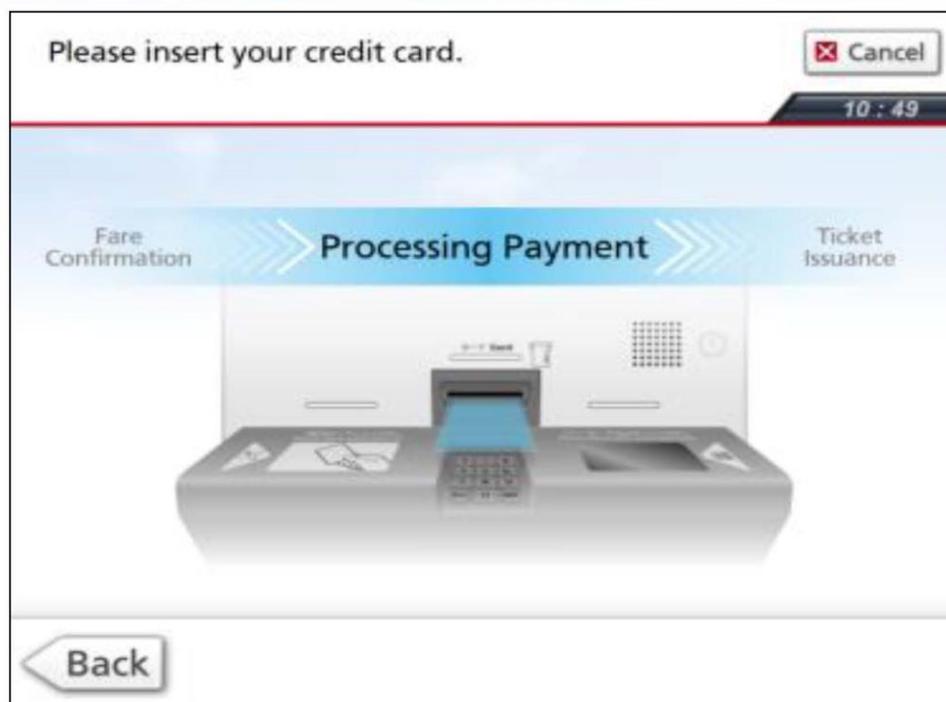
Class J e-Coupons are also acceptable.

Use My Upgrade Point

**Next**

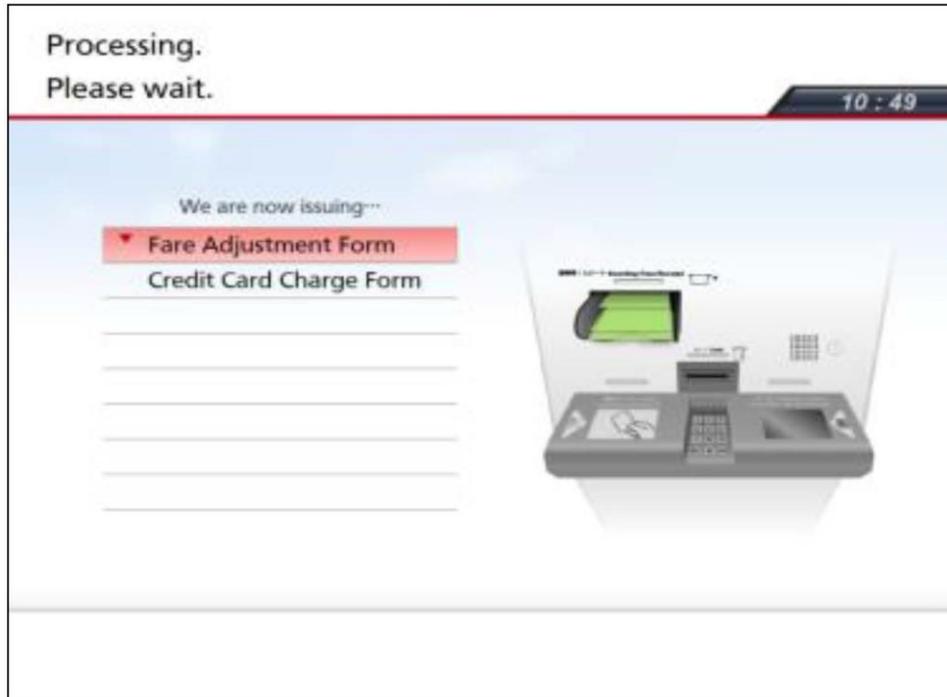
16

## Insert Credit Card



17

CCCF, Boarding pass issued



18

# **ACRP**

## **Project 10-17**

### **Implementing Integrated Self-Service at Airports**

#### **Task 3b:**

#### **Case Study Report #2a**

#### **Amsterdam Schiphol Airport (AMS)**

TRANSPORTATION RESEARCH BOARD  
NAS-NRC

Submitted by:

**Barich, Inc.**

## INTRODUCTION

This Case Study Report (Report) documents the findings of the case study with the Amsterdam Schiphol Airport (AMS). This Report contains the information collected during the site walk, and discussions with the AMS delegates. Relevant documents collected during the Case Study are included as Attachments to this Report. Although detailed analysis of the information collected will be conducted in a later task, this Report provides preliminary analyses to present relevance to the overall project objective.

The information contained herein is crucial for developing the framework for the Guidebook, especially the final section “Key Highlights/Take-Aways”, which highlight very valuable information and specific areas where information will continue to be assimilated for use with the Guidebook.

The AMS has articulated an “ambition” to be “Europe’s preferred airport.” This ambition has translated into, amongst other things, an emphasis on passenger self-services and aviation industry innovations. This spirit provides the basis for evaluating current passenger experience and services, considering all options for improvement and for how the AMS assesses, establishes, plans, and tracks success of technology projects related to passenger self-services at all passenger journey points.

## BACKGROUND

### Entities/Location/Attendance

AMS is privately managed by the Schiphol Group, which in turn composes the Airport staff. This background is relevant for a better understanding of the content in this Report. The Case Study was conducted at the offices of AMS, from 11:00 AM to 9:00 PM on May 19, 2014. The Agenda for the Case Study is included as Attachment 1. Research Team Members conducting the Case Study were Frank Barich (Lead Researcher) and Peter Longoria (Researcher).

The AMS sponsor, Mr. Kees Jans, setup interviews with Marianne van Scherpenzeel (Manager Terminal Logistics, Passenger Services) and Christa Bakker (Manager E-Business) of the Schiphol Airport. Mr. Jans himself (Chief Information Officer) provided a tour of key passenger self-services throughout the Airport. Mr. Jans also assisted the Research Team by setting up a discussion with Mr. Rob Zwerink, KLM airline’s Director of E-Development. The discussion with Mr. Zwerink is captured in Case Study 2b.

### Case Study Objectives

Based on secondary research on AMS and KLM, as well as an initial phone interview with and preliminary survey responses by the AMS Sponsor, the Team discovered useful



information and valuable opportunities which identified AMS as well as KLM as strong case study subjects. Therefore, this case study entails the following objectives:

- Understand as best as possible, the process in which an airport or airline chooses to introduce passenger self-services
- Evaluate the basis behind the planning and implementation of specific self-services
- Document the means in which the airport or airline measures the benefit of self-services, including discussing cost consideration affecting self-service initiatives.
- Understand the integrated components that may exist between the services, and the collaboration opportunities between airport and airline(s)
- Get a better understanding how social media supports self-services
- Inquire about future self-service initiatives, either planned or considered

## Research Approach

To meet the objectives, the Team had compiled a series of comprehensive worksheets and preparation documents designed to help facilitate the flow of meetings and collection of information. This documentation was discussed and sent to the case study coordinators prior to the actual on-site visit. Survey information is still pending. Additionally, a presentation, as provided in Attachment 2, given by Mr. Jans in May of 2013 on “IT services for passengers” was reviewed.

Once on site, the Research Team engaged with the various AMS delegates during a number of interviews. In addition, an airport site walk was conducted to experience the self-service efforts first hand.

## KEY HIGHLIGHTS/TAKE-AWAYS

This Case Study achieved very valuable results for the development of the project Guidebook.

## Vision and Planning

The AMS has identified as their “ambition” to be “Europe’s preferred airport.” This speaks to both the preference of passengers as well as airlines. Ms. van Scherpenzeel’s group focuses primarily on the passenger’s experience upon arrival within the terminal until departure. She confirmed that planning for passenger self-service takes a very comprehensive approach and considers passenger self-services initiatives from the moment the passenger arrives at the terminal to when the passenger boards the aircraft. AMS is highly structured in their efforts toward achieving this ambition and the central aspect of this structure is the heavy use of surveys and studies. These surveys and studies generate the metrics that form the basis for identifying and justifying projects as well as



evaluating total airport progress toward improving passenger service and experience. It should be noted that when considering airport capacity, the focus is not on the number of passengers but rather on the time spent at process points. For example, it is not as important to know that the number of passengers processed through a security gate has increased, as it is important to know that the time it takes a passenger to go through the security gate decreases.

In addition to the surveys and studies, AMS has a separate division (Passenger Services Division) that is specifically dedicated to the improvement of passenger services and processes and, therefore, reviews them from a strategic and tactical perspective. This division reviews the survey information and works with other airport staff, as applicable, to identify possible solutions (IT and non-IT) to noted issues. AMS also has a business information manager from the Information and Communications Technology (ICT) Division - AMS' IT division - that is focused on passenger services. This business information manager is the bridge between the Passenger Services Division and the ICT Division to ensure IT and IT integration is properly considered in the project planning. Project ideas are then further researched, developed, and proposed to an Investment Board that is made up of airport directors and that are responsible for all commercial activities. This investment board reviews the metrics, business cases, capacity studies, project timing, input from various airport managers, and overlap and interference that may exist between proposed projects.

Passenger services and experience surveys are conducted every two months, manually, by airport staff that walk passengers through a set of questions that are the same each time the survey is conducted. In this manner the frequency of the surveys provide on-going assessment of services, systems, processes, and trends; whereas the consistency of the questions ensures the reliability of the data from one survey to the next. The questions help to measure actual performance against established Key Performance Indicators (KPI). Such information can help in developing a strong business case for projects targeting problematic issues. Additionally, consistent surveys show whether or not overall project efforts are resulting in improved feedback from passengers.

Capacity studies, which are conducted annually, evaluate processes, space, queues, systems, etc. Airline input is sought and reviewed as part of these studies as well as information from IATA and ACI surveys and reports. These capacity studies provide the findings through a dashboard identifying critical timeframe points. Project priorities are color-coded for each system and process as green, orange, or red; with red indicating critical capacity issues and orange indicating growing and projected critical capacity issues. Projects are planned to address red and orange issues. Project prioritization is still a challenge; everything is considered "high" priority. These studies also review competition airports to see how to help airlines save costs to make AMS more attractive to airlines.

It is through capacity studies that the airport has learned ~60% of airport traffic constitute transfer passengers and that more effort needs to be put into better addressing the needs of these types of passengers.

Other information AMS garners from IATA and ACI reports includes new means and methods for how other airports are addressing challenges and providing new passenger services. AMS reviews these updates to see how some variation may be applied to Schiphol across all passenger journey points.

AMS' evaluation and planning methodology is important, because it provides a clear path for not only identifying problem areas that conflict with the Airport's Vision, but also providing targeted projects for addressing these areas in common and innovative ways.

A belief that drives many of the project decisions is that passengers are most happy when they are in control of their journey and are able to board a flight in a timely manner, regardless of terminal capacity or process points. This belief drives many of the decisions regarding common use and mobile services that AMS offers and why the airport seeks to prepare the passenger for their travel, as much as possible, prior to the passenger coming through the door. AMS also translates this to mean the passenger is able to use the Airport effectively as a dynamic meeting place. This thinking is aligned with the Airport Vision that, "An airport is viewed as an AirportCity – a dynamic meeting place." Considering its Vision, the Schiphol Group's Mission is, "To further develop AirportCities and AMS and to create sustainable value for stakeholders."

Since ICT manages the Information Technology at AMS, it is notable that in support of the overall Airport Vision, Mission, and Ambition, ICT has established its own Vision, Mission, and Ambition Statements:

***Vision:***

*Innovative, professionally managed IT systems are essential for the business success of Schiphol Group.*

***Mission:***

- *Supporting the airport operation*
- *Managing IT complexity*
- *Initiating and facilitating business innovation*

***Ambition:***

*Being the business' preferred IT partner*

The Schiphol Group and ICT determined the following key drivers are necessary to help achieve the Vision points discussed above:



- Self-Service enables the passenger/consumer to be in control
- Common Use provides the Schiphol Group the means to lower costs to the airline

## Business Cases

All projects require a business case be developed to indicate what problem is being solved, what risks are associated with the project, and what benefits are anticipated. Though AMS does not value innovation for innovation's sake, it does not shy away from risk if there is sound thought behind a new solution idea and subsequent expected benefit garnered in a successful project. Such information is provided as part of a project's business case analysis. The two key aspects of business cases targeted at passenger services and processes are: (a) do passengers like it, and (b) does it free up staff?

AMS understands that being innovative means that there are very real risks that may result in an unsuccessful project. However, AMS equally embraces well conducted innovative projects as it understands that new avenues are sometimes needed to provide the lower operating costs airlines with what they are looking for and to grant the increased amount of control the passenger and consumer are seeking.

## Passenger Tracking

A limited form of passenger tracking is used extensively to measure and monitor passenger queue wait times and passenger behavior and tendencies throughout the Airport. Passenger tracking is used to understand security queue times, passenger movement throughout the airport, shopping preferences of passengers on specific flights, and use of various passenger services including passenger self-services.

Passenger tracking is "limited" in the sense that passenger specific information (i.e. name, gender, age, etc.) is not used or logged in any way. The process for tracking passenger movement is such that the MAC address for a passenger's mobile device is used in conjunction with a unique key that is regenerated daily. To create a unique passenger identifier for that device, for that day, the key and the MAC address are combined through an algorithm that provides the identifier. This identifier is what is tracked and monitored throughout the airport. On another day, this same MAC address would be paired with a different key to generate yet another unique passenger identifier. There is no means for pairing the different identifiers assigned to a passenger from visit-to-visit and, as such, there is no way to generate a passenger specific log of that passenger's tendencies from one visit to another. Airline and authorities have verified that the Passenger Database does not store sensitive passenger information.

As passenger data is a vital part of understanding passenger movements, decisions, and tendencies, AMS seeks to capture as much non-sensitive passenger data as possible with the idea that AMS can figure all the various ways this data can be used later. One example given for how passenger tracking is used today is the scanning of boarding passes at retail



locations. This information is used to inform retailers and airport property managers what items passengers are purchasing at particular gates, to particular destinations, and at particular times. With this information the airport can provide more shops that address these passenger needs and the retailers can provide the corresponding goods these shoppers are buying in the appropriate locations. An idea for how passenger tracking could be expanded is to enlist the help of customs agents to scan passenger boarding passes, thereby providing information to the airlines, alerting that a passenger is being further reviewed and will subsequently not make the flight. Currently, airlines do not know any particulars about why a passenger has not made it to the gate, which can cause a flight to be delayed as the airline waits for the passenger to turn up.

## **Data Architecture**

A standards-based data architecture is at the foundation of Schiphol's ability to share data between the various data systems. An architecture such as this allows for new systems to be deployed while providing data that is usable by all and that can be consolidated into a single database that is populated by information from each of the various systems. It is through this architecture that the Schiphol's Passenger Database was created and is continuously populated. Examples of the data architecture standards used include the ACI-led Aviation Standard Airport Community Recommended Information Services (ACRIS) and a general software industry standard known as service-oriented architecture (SOA). AMS' use of this standards-based architecture is significant in that it proves out the efforts and the direction the Aviation industry is trying to move toward by acting as an example of the integration and system interchangeability benefits it brings.

## **E-business/Social Media**

Schiphol's E-business includes the management of the Airport's website, email marketing, intranet, and extranet (communicate with an internal group of people, i.e., airline managers) and extends through social media. All media channels are measured and this information is used to try to improve each of them to better engage and meet the needs of users of these channels. E-business also advises the different departments of the Airport on how to do their business digitally. Advisement includes covering what is required if a given department wants to start a facebook page or web page, for instance. All the departments want their own web page but the Airport requires that each department has to keep their own web page content up-to-date and E-business helps them to understand this as well as other requirements that come with the different media channels.

A group of Airport directors are responsible for all the AMS commercial activities. The Manager of E-business reports and advises this group on E-business issues.

E-business information is tracked on everything. Automated tools are used, however cannot be completely relied upon, and require some review of the findings when



measuring “success”. Comments such as “I’m waiting here for hours to get coffee. Isn’t that nice?” does not mean a happy customer but an automated tool might interpret it that way.

At Schiphol, social media is a part of the overall process to please the passenger and give them an effective distraction to help them forget they are traveling. Measuring an Airport’s return on investment with social media is difficult, but AMS views engaging in the use of social media a must. AMS’ E-business perspective is, “[The passengers] are calling, [the Airport] has to answer.”

To this end, Schiphol’s E-business is active in the following social media channels: Facebook, Twitter, Linked-In, Pinterest, g+, and YouTube. Schiphol’s YouTube channel was noted as being especially successful with a great deal of interest on behind-the-scenes videos regarding the various operational aspects of the Airport, such as how de-icing of a plane is performed. For other social media channels, travel information, such as flight information, has been found to be the most important to users. AMS has found that “commercial”, or advertising centric messages are not well received in social media channels. Instead, social media messages need to be a combination of information and “fun”. The quality of posts is measured by the engagement on a particular post.

Schiphol also uses social media channels as a means for connecting with passengers that are having issues with their travel plans and as an opportunity to further please their passengers. AMS’ current policy is to respond to media inquiries within an hour. This response time will be decreased to 30 minutes in the coming months, though this response time is already typical for the AMS’ twitter channel. This is done with vendor support to address on-line questions and a team of 6 staff members that monitor the various channels in addition to other job duties. Retail and parking questions are answered by airport retail staff between 6AM and 12 midnight. There are no staff members that monitor social media as a full-time position. Emphasis on social media is readily apparent when contrasting Schiphol’s response time to e-mail inquiries of 24-48 hours. Schiphol’s twitter channel receives an average of 50 real questions per day but there are also a number of people that post they have arrived at Schiphol and Schiphol will respond with a welcome. Schiphol Airport information is not integrated. This is an issue that is being addressed.

Airline to Airport cooperation is happening at AMS and is highly valued. This occurs on a daily basis when passenger messages are received through social media and passed on to the appropriate party to respond. It also occurs at regular intervals throughout the year as AMS’ E-business meets with the airlines (for example, meetings with KLM occur four times per year) to specifically discuss social media and working to improve coordination and responses across all media channels.

To improve upon E-business avenues, Schiphol’s Manager of E-business does not look to other airports for inspiration. Instead, Schiphol looks to other companies in other markets to find who is doing E-business well.



## **Airline Cooperation**

As previously mentioned, AMS seeks to be Europe's preferred airport for airlines. This ambition is largely the impetus for the close cooperation between Schiphol and its airlines and particularly its dominant carrier, KLM. Schiphol works closely with its airlines to accommodate their business processes whenever AMS is looking to modify a process with the goal of improvement. Schiphol speaks with its airlines prior to starting a project to ensure there is benefit to the carriers and ensure there is buy-in as much as possible. Additionally, AMS believes that reducing airline operational costs is an important part of becoming the airlines' preferred airport and making Schiphol a competitive place for business. For this reason, coordination efforts with the airlines is also meant to uncover potential means for reducing airline operational costs at AMS. It is important to AMS to develop this basis of cooperation with its airlines before starting the logistical aspects of a project as it helps projects to run more smoothly and increases the likelihood of the Airport and the airlines both working toward a successful project outcome.

## **Site Walk of Schiphol Airport**

The AMS hosted a site walk of the airport, during which the Research Team discussed various initiatives to better understand the AMS approach to passenger self-services.

### ***Common Use and Kiosks***

For check-in and printing of boarding passes, most airlines have actively worked at preparing the passenger through web-based check-in and printing of boarding passes. Some airlines actually require this to be completed by its passengers prior to airport arrival. Therefore, the Schiphol Group views the maintaining of kiosks and processes used for check-in at the airport as a costly use of that equipment, maintenance, and space, when compared to the costs for a passenger to check-in at home, or at some other convenient point and has stated that it no longer sees enough value in continuing to invest in the traditional ticketing only passenger self-service kiosks to provide them for use in the Airport. However, the airlines continue to value these kiosks and have taken to managing the deployment and on-going operation of common use kiosks in Schiphol Airport through the airline's club.

As KLM is the dominant carrier and accounts for such a significant footprint within the Airport and specifically in departures, KLM is allowed to have their own kiosks and their own kiosk application. Deploying their own kiosk in this manner allows them to enable technologies as they desire, rather than being limited by the technological limitations that may come with a common kiosk. The following are some sample photographs.



### ***Self-bag Drop***

AMS is known to be an Aviation industry leader in the development and deployment of self-bag drop passenger self-service. Solutions in self-bag drop are being deployed as one and two step processes. Schiphol decided upon a single step process such that the bag drop point is both the kiosk and the bag drop. The setup has an agent manning the entrance to the drop off kiosks and regulating queuing so that passengers at the kiosks do not feel rushed from having another passenger standing right behind them as they work through the bag drop process. Once the passenger tags the bag, the passenger then places the bag in the bag well and the bag well cage drops and secures the bag. At this point the bag label is scanned and activated and placed on a buffer belt until a second bag is similarly processed. This buffer belt is used as a staging area. When the second bag is processed, both bags are pushed onto the primary bag belt and continue into the baggage handling system. In the case the passenger decides not to fly for whatever reason, the bag can be immediately returned to the passenger and the bag tag deactivated.

The self-bag drop was deployed as a trial with KLM airlines and is now being beta tested in a common use capacity with other airlines with planned deployment in Q3/Q4 of this year. Per the Airport CIO, its success is prompting continued rollout of additional kiosks in a common use capacity. Success has been defined such that passenger processing throughput has increased, airline staffing needs has decreased, and because kiosks can be charged to airlines on a per use basis versus a dedicated use model, airlines are saving money in operating costs. For the Airport, the self-bag drop service is proving true that the

Airport can increase its passenger capacity without adding physical terminal space. The following are some sample photographs.



### ***Automated Passport/Border Control***

To reduce queue times and increase passenger throughput at border control check points, AMS has deployed passenger self-service stations that allow a passenger to scan their travel documents and verify their identity through iris scanning recognition. This service is tied to membership in the Airport's Privium program. The process is completely automated except for the instance that a problem is determined. At this point, the passenger is directed to a border control agent. As with many other projects, this one was found to be a source of pain for passengers and determined to be a solution that could be solved technologically to improve the passenger experience and the Airport's passenger processing capacity.

In assessing how this project would be funded, the Airport discussed the project with border control who stated they did not have the funds for the project. AMS deemed the value of this project high enough that, though the Airport did not own this process, the benefit to the Airport and to its passengers was significant enough that AMS decided to fund the project. Subsequent surveys have indicated reduced wait times has enhanced passenger experience and happiness. The following is a sample photograph.



### ***Privilium***

To further work to become Europe's preferred airport in the eyes of its passengers, Schiphol offers the Privilium program. Membership in this program is meant to provide benefits that will make a passenger's use of the Airport more comfortable and enjoyable. Privilium offers Automated passport/border control in public queues and, for the higher level membership, through the Privilium Lounge where the line is sure to be minimal. The lounge itself offers high end luxury comfort seating and snacks, quiet areas, and flexible workstations. Additionally, membership in Privilium can include priority parking in up front areas and discounts on Schiphol valet parking as well as access to an Airport Assistance Service. The Privilium program illustrates how self-service can also be achieved through non-technological means while still facilitating a great passenger experience as well as additional revenue generation for the Airport. The following are some sample photographs.



### ***Self-Service Security Document Verification for Check-Point Access***

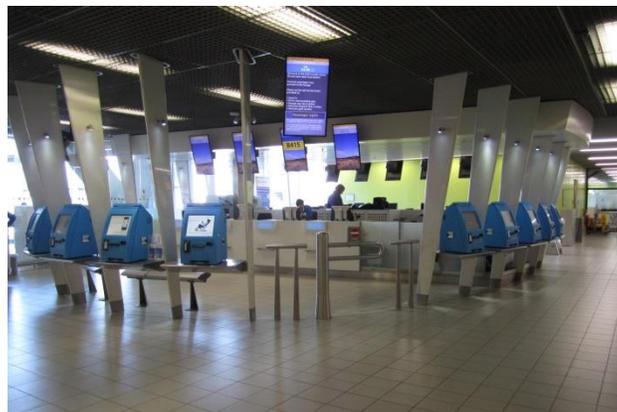
To reduce queue times and increase passenger throughput at security check points, automated document verification systems (same vendor solution often used for self-boarding) have been deployed. These systems allow the passenger to self-service the verification of boarding pass and passenger identification prior to entering the check-point

queue. The scanning of passenger information at this location additionally serves to provide AMS with queue wait times by noting the entrance of the passenger into the queue. The following is a sample photograph.



### ***KLM Transfer Kiosks***

Through the use of capacity surveys, Schiphol has learned that ~60% of their passenger traffic is transfer. For KLM, the dominant carrier of the Airport, this percentage is even greater. Given the sizeable numbers of KLM passenger transfer traffic and the desire to ensure the happiness of passengers traveling through the Airport, Schiphol and KLM worked together to locate and provide kiosks that would enable passengers to self-service checking in for a connecting flight, reprinting of boarding passes, change seats, and obtain individualized flight information. This reduces airline agent staffing needs resulting in lower operational costs for KLM. The following is a sample photograph.



### ***Security Checkpoint Customized Screening Conveyor***

In deploying a new security checkpoint, Schiphol worked to improve upon the typical security screening process and minimize the time fast moving passengers spent waiting on

slower moving passengers when trying to progress through security screening. Working with a trusted vendor, Schiphol redesigned the initial process of obtaining a screening tub. This was done by having the tubs dispensed from under the conveyor in three different locations. Also, the tub dispensing area is curved in a semi-circle to convey that approaching this queue does not have to be done in a “line” as is traditionally done and that passengers are free to move forward when they are ready to do so, not when the passenger in front of them is ready to do so. The following are some sample photographs.



## ATTACHMENT 1

### Case Study Agenda

Date & Time	Content
19 May Mon 11:00	<u>Meeting 1</u> <u>Terminal Logistics</u>
	<b><u>AMS delegate</u></b> <b>Ms. Marianne van Scherpenzeel</b> , Manager Terminal Logistics, Passenger Services
14:00	<u>Meeting 2</u> <u>KLM E-Commerce</u>
	<b><u>KLM delegate</u></b> <b>Mr. Rob Zwerink</b> , Director E-Development
15:00	<u>Meeting 3</u> <u>E-Business</u>
	<b><u>AMS delegate</u></b> <b>Ms. Christa Bakker</b> , Manger E-Business
16:00-19:00	<u>Airport Tour (Terminal Building)</u> <i>Suggested route:</i> <i>Arrivals and Schiphol Plaza Common Use Kiosks → Departures KLM Self Bag Drop, Self-Service Border Control → Departures Common Use Self-Bag Drop, Self-Service Security Checkpoint Queue Access → Privium Lounge Self-Service Border Control → (move to airside) → KLM Self-Service Transfer Kiosks → Security Checkpoint Customized Screening Conveyor System</i>
	<b><u>AMS delegate</u></b> <b>Mr. Kees Jans</b> , Chief Information Officer
19:00-21:00	<u>Dinner</u>
	<b><u>AMS delegate</u></b> <b>Mr. Kees Jans</b> , Chief Information Officer
21:00	End

## **ATTACHMENT 2**

**Presentation by Kees Jans**

**CIO Schiphol Group**

**May 16, 2013**

**“Airport IT in the future (?)  
IT services for passengers”**

## Airport IT in the future(?) IT services for passengers



## Agenda

- Schiphol Group (IT)  
(an introduction)
- IT services for passenger
  - IT Architecture
  - Examples at Schiphol

## Schiphol Group

**Vision:**

An airport is viewed as an AirportCity – a dynamic meeting place

**Mission:**

To further develop AirportCities and Amsterdam Airport Schiphol and to create sustainable value for stakeholders

**Ambition:**

Being Europe's preferred airport



## Schiphol Group activities



- Amsterdam Airport Schiphol
- Rotterdam Airport
- Eindhoven Airport
- Lelystad Airport

- JFK International Terminal 4 (management & shareholder)
- Aéroports de Paris (alliance, 8% shareholder)
- Brisbane Airport (management & shareholder)
- Arlanda Stockholm & Göteborg (retail management)
- Aruba Airport (management contract)



## Amsterdam Airport Schiphol Facts & Figures 2012

Passengers	51 million
Air Transport Movements:	423.400
Ranking in Europe in passengers:	4th
Ranking in Europe in freight:	3th
Home carrier:	Air France-KLM
Alliance:	SkyTeam
Destinations:	317
Employment at Schiphol:	64.000
Employees Schiphol Group:	2.100



## Amsterdam Airport Schiphol Facts & Figures 2012

Passengers	51 million
Air Transport Movements:	423,400
Ranking in Europe	
Ranking in Europe	
Home carrier	KLM
Alliance:	
Destinations:	
Employment at Schiphol:	64,000
Employees Schiphol Group:	2,100



## Amsterdam Airport Schiphol Facts & Figures 2012

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Home carrier:	Air France-KLM
Alliance:	SkyTeam
Destinations:	117
Employment at Schiphol:	64.000
Employees Schiphol Group:	2.100

**Best European Airport**  
(Skytrax, April 19, 2012)  
Skytrax, April 16, 2013



## Schiphol Group

Information & Communication Technology (ICT)



 **Schiphol**  
Group

## Schiphol Group ICT

**Vision:**

Innovative, professionally managed IT systems are essential for the business success of Schiphol Group.

**Mission:**

- Supporting the airport operation
- Managing IT complexity
- Initiating and facilitating business(!) innovation

**Ambition:**

Being the business' preferred IT partner



## Schiphol Group ICT Facts & figures 2012

Total ICT operating costs (million €)	65 (4,7% of Schiphol costs)
ICT employees (incl. ST*):	210
ICT systems:	100
Flight information displays:	2300
#sensors (to monitor assets):	50.000
Flight information connections:	60
Office workstations:	2200
Average ICT project hours	85.000 (yearly)

\* Schiphol Telematics (ST) is the airport's Telecom Operator and a 100% subsidiary of Schiphol Group (85 FTE).



## Schiphol Group (IT) Services for Passengers

### Our Vision:

Passenger/consumer wants to be in 'control'

Airline wants low(er) airport charges



## Schiphol Group (IT) Services for Passengers

### Our Vision:

Passenger/consumer wants to be in 'control' => **Self Service**

Airline wants low(er) airport charges => **Common Use**



## Schiphol Group (IT) Services for Passengers

### Our Vision:

Passenger/consumer wants to be in 'control' => **Self Service**

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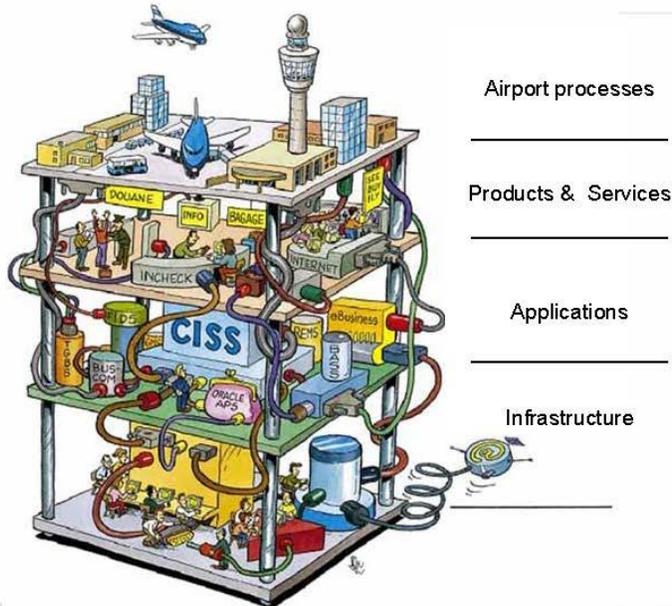
To shorten time to market and  
To gather PAX process data  
You'll need the right



To shorten time to market and  
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**IT Architecture**

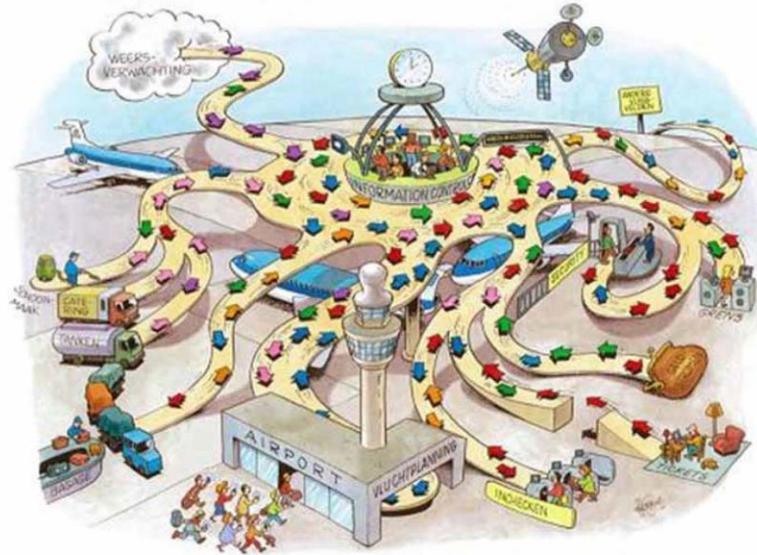


## IT architecture: relation business-IT



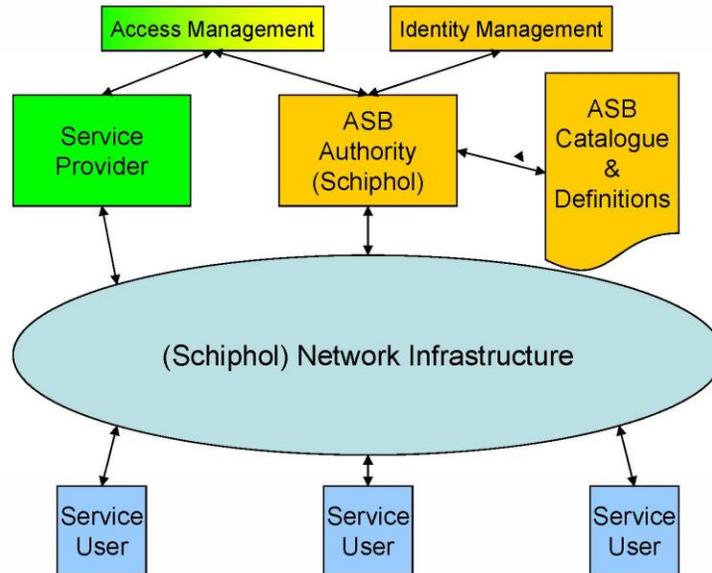
## Airport Service Bus

Sustainable and efficient information exchange at Schiphol



Schiphol  
Group

## Airport Service Bus Implementation of Service Oriented Architecture



## Schiphol Group (IT) Services for Passengers

### Our Vision:

Passenger/consumer wants to be in 'control' => **Self Service**

Airline wants low(er) airport charges => **Common Use**



## Schiphol Group (IT) Services for Passengers

### Our Vision:

Passenger/consumer wants to be in 'control' => **Self Service**

Airline wants low(er) airport charges => **Common Use**

Common Use Self Service solutions at Schiphol:



## Common Use Self Service at Schiphol



## Common Use Self Service at Schiphol



## Common Use Self Service at Schiphol



## Common Use Self Service at Schiphol



## Common Use Self Service at Schiphol



## Common Use Self Service at Schiphol



## Schiphol Group Europe's preferred airport\*



\* Powered by ICT



## Schiphol Group Europe's preferred airport\*



\* Powered by ICT



# **ACRP**

## **Project 10-17**

### **Implementing Integrated Self-Service at Airports**

#### **Task 3b:**

#### **Case Study Report #2b**

#### **KLM Royal Dutch Airlines (KLM)**

TRANSPORTATION RESEARCH BOARD  
NAS-NRC

Submitted by:

**Barich, Inc.**

## INTRODUCTION

This Case Study Report (Report) documents the findings of the case study with KLM Royal Dutch Airline's (KLM). This Report contains the information collected during the discussion with the Director of E-Development. This discussion occurred in coordination with the Schiphol Amsterdam International Airport Case Study, Case Study Report #2a. Although detailed analysis of the information collected will be conducted in a later task, this Report provides preliminary analyses to present relevance to the overall project objective.

The information contained herein is crucial for developing the framework for the Guidebook, especially the final section "Key Highlights/Take-Aways", which highlight very valuable information and specific areas where information will continue to be assimilated for use with the Guidebook.

KLM has a dedicated team for E-services (on-line check-in, baggage, lounge, etc.) and is looking forward to advancing innovative passenger services as passengers continue to become more comfortable and increasingly expect to self-serve on-line and through mobile devices.

## BACKGROUND

### Entities/Location/Attendance

The Case Study was conducted in the Sheraton Amsterdam Airport Hotel lobby adjacent to AMS from 2:00 PM to 3:00 PM on May 19, 2014. Research Team Members conducting the Case Study were Frank Barich (Lead Researcher) and Peter Longoria (Researcher).

The AMS sponsor Mr. Kees Jans setup the interview with Mr. Rob Zwerink, KLM's Director of E-Development. This was done in conjunction with AMS Case Study #2a.

### Case Study Objectives

Based on secondary research on AMS and KLM, the Team discovered useful information and valuable opportunities which identified KLM as strong case study subject while studying Schiphol Airport. Therefore, this case study entails the following objectives:

- Understand as best as possible, the process in which an airport or airline chooses to introduce passenger self-services
- Evaluate the basis behind the planning and implementation of specific self-services
- Document the means in which the airport or airline measures the benefit of self-services, including discussing cost consideration affecting self-service initiatives.

- Understand the integrated components that may exist between the services, and the collaboration opportunities between airport and airline(s)
- Get a better understanding how social media supports self-services
- Inquire about future self-service initiatives, either planned or considered

## Research Approach

To meet the objectives, the Team had compiled a series of comprehensive worksheets and preparation documents designed to help facilitate the flow of the meeting and collection of information. This documentation was sent to the case study coordinator prior to the actual on-site visit. Once on-site, the Research Team conducted the interview with Mr. Zwerink.

## KEY HIGHLIGHTS/TAKE-AWAYS

This Case Study achieved very valuable results for the development of the project Guidebook.

### Vision

The three key components of KLM's E-Development vision for passengers are:

- Deliver the right service, at the right touch point, at the right time
- Provide as much of the process as possible off the airport
- Give the customer as much choice as possible.

These three components drive innovation in KLM's services and align the airline well with the Schiphol Airport's drivers, smoothly pairing the airport and its dominant airline.

### E-services as Revenue Opportunity

Mr. Zwerink stated that KLM is looking to E-services as a relatively new opportunity for revenue generation. Customers are always online, even while at an airport. With that in mind much thought is being put into how KLM can best make use of a passenger's dwell time and location information in order to best reach the passenger and create opportunities for up-selling additional services. Expounding specifically on the aspect of geo-location, Mr. Zwerink stated that location-based services are upcoming. This capability is important to the airline as it will allow KLM to better service their customers by reducing delays in such instances as holding planes for passengers that are "stuck" in customs. Knowing that the passenger is being held up means the Airline can make a better informed decision on whether to continue to hold the plane or pull the customer's baggage from the plane and begin rebooking the customer for another flight.



Under normal circumstances, KLM could advise customers on which security checkpoint and lane to take for faster processing, as well as provide them with an estimate for when they need to be at the gate to catch their flight. This would allow KLM customers to plan and maximize their time spent on shopping, providing them with “peace of mind, since they know how much time they have available.

Social media, including a variety of channels, is one E-service avenue that KLM has been steadily advancing and has reached a certain level of maturity. It targets to respond to customer inquiries within 1 hour. This is accomplished through the use of 150 agents that are dedicated to monitoring the various social media channels and responding to inquiries. KLM offers 24-hour support in 12 languages.

Mr. Zwerink reiterated that KLM desires to reach their customer both on-airport and off-airport and has no rigid distinction between the two. The preference is certainly to engage the passenger prior to arrival at the airport. This is part of the vision and on-going effort to drive as much of the passenger travel process as possible off the airport. Airport kiosks are considered a last resort for passenger engagement before security.

Nevertheless, Mr. Zwerink confirmed that there will still be a need for kiosks for some time and that KLM is currently working on a project. KLM kiosks in Departures 1 of the Schiphol Airport Terminal have been outfitted with cameras and NFC readers. KLM is intently studying the use of NFC for mobile payments, a trend they see for the near future. Although these features are not yet in actual use, the kiosks have been designed accordingly to meet the requirements of these features. The following shows such a kiosk.



Future efforts in regard to how kiosks can function and be utilized can entail to improve the way kiosks and mobile devices connect so that they better complement each other and, therefore, enabling the airline to offer a more seamless interaction between the two. An example of kiosks and mobile devices integrating smoothly is the ability to use the kiosks to print something stored on a mobile device. Another example would be to complete a process on a kiosk that was started on a mobile device.

## Metrics

Metrics are highly valued by KLM for the purpose of understanding their customer and for evaluating initiatives meant to improve engagement, service, and customer experience. Customer panels, usability testing, on the spot customer interviews, and website click behavior analyses are all methods used to understand customers and to determine success of a new initiative to improve passenger service and experience. Results of these studies and analyses provide results against key performance indicators (KPI) that help determine the effectiveness and value of a given initiative.

It is through these methods that KLM was able to learn that 70% of KLM's passengers in Schiphol are transfer passengers. Using this information, KLM worked with the airport to establish ample KLM kiosks for transfer passengers and to build a business case for provision of a KLM lounge. Through these studies, KLM also learned that 70% of their passengers utilize mobile boarding passes and that there are still 30% of passengers that are not yet ready for it.

## Airport Infrastructure

Mr. Zwerink stated that an Airport's communications infrastructure is very important to KLM to allow the airline to service their customers and maximize operational effectiveness. It was noted that KLM's reliance on the airport infrastructure is most heavy at KLM outstations, where the airline has a small operational presence. In responding to a request for an example of a pressing airport-offered infrastructure item for KLM, Mr. Zwerink stated that a current KLM need at airports is for ubiquitous wireless connectivity including connectivity for ground services around aircraft and for other operational uses.

When asked about Common Use as an infrastructure item, Mr. Zwerink responded that he had not heard of the CUPPS discussion in some time, but that success for this relies heavily on kiosks being in the right position.

## Development/Innovation Challenges

The interview revealed a number of items that impact an airline's ability to develop and innovate its business.

The first related to authority regulation challenges and subsequent development costs to address them. For example, the latest U.S. mandates on kiosks regarding accessibility features make it especially difficult for an international airline that has to comply with regulations from different countries.

The ability to influence airports was another identified item that impacts/challenges development and innovation. This is not so much an issue for KLM in Schiphol where the airline is the dominant carrier, but it certainly is at airports where that is not the case. For example, KLM must rely on IATA, as well as their SkyTeam and Star Alliances partners, as



their platforms for negotiations and to gain influence and create volume of combined efforts in international airports, including U.S. airports.

Collecting and analysis customer geo-location information, as previously mentioned, is a capability that KLM would like to leverage for providing better services and maximizing revenue generation opportunities. However, the tracking of passengers is a development challenge as it requires working closely with airports in regard to the big question of, “who owns the passenger?” Cooperation also needs to focus on learning how to share information. Airports and airlines need to figure out how to work together addressing regarding this issue in order to jointly combat 3<sup>rd</sup> party services (such as offered by Google). These new market players are working hard to provide services to airport/airline customers that are in direct competition with services the airports and airlines are trying to offer.

Another challenge to collecting and using geo-location information of passengers is that the US is generally more protective of customer data than other countries. This cultural difference also impacts efforts in innovating the security screening process. Mr. Zwerink contends that it is better for security to focus on the non-trusted passenger and less on the trusted.

It was also previously mentioned that kiosks will be a major part of KLM’s strategy for some time. This is in part due to KLM’s assertion that personal mobile devices and connectivity is not yet robust enough for roaming in an airport environment. It is not that these devices do not work at all, but it is about the fact that they cannot always be counted on to work reliably (i.e., no problems with OS, local app, etc.) and to be consistently connected to the internet, everywhere; especially when roaming. Reliance on wireless connectivity is only becoming more prevalent for both the passenger and the airline, as communication between the two is beneficial and relevant for both parties. To that extent, Mr. Zwerink believes that airports need to provide wireless service free of charge to passengers to ensure all passenger can and will be connected.

In addition, Mr. Zwerink mentioned that during the self-bag drop beta testing and implementation it was realized that a new mindset needed to be forged in its agents. Self-bag drop at Schiphol required that the agents come out from behind their counters to assist the passengers in learning this new system. It was not the way they were used to servicing the customer and it required some change management. The next challenge will be to overcome the changes required as more and more hand-held devices, such as tablets, are used by KLM staff to service the customer throughout the airport.

## Customer Loyalty

Customer loyalty is important to any business and it is true for both the airline and the airport. KLM puts much effort into increasing such loyalty through the customers’ use of the KLM website as well as other multi-media offerings/channels. In discussing the



previously stated question of, “Who owns the passenger,” Mr. Zwerink stated that he is of the position that the passenger should be allowed and enabled to decide whether to use applications offered by airlines or the airport during their travel journey.

# **ACRP**

## **Project 10-17**

### **Implementing Integrated Self-Service at Airports**

#### **Task 3b:**

#### **Case Study Report #3a**

#### **Montréal–Pierre Elliott Trudeau International Airport (YUL)**

TRANSPORTATION RESEARCH BOARD  
NAS-NRC

Submitted by:

**Barich, Inc.**

## INTRODUCTION

This Case Study Report (Report) documents the findings of the case study with Aéroports de Montréal (ADM) staff, managing the Montréal–Pierre Elliott Trudeau International Airport (YUL). This Report contains the information collected during the discussions with the ADM staff. Relevant documents collected during the Case Study are included as Attachments to this Report. Although detailed analysis of the information collected will be conducted in a later task, this Report provides preliminary analyses to present relevance to the overall project objective.

The information contained herein is crucial for developing the framework for the Guidebook, especially the final section “Key Highlights/Take-Aways”, which highlight very valuable information and specific areas where information will continue to be assimilated for use with the Guidebook.

## BACKGROUND

### Entities/Location/Attendance

ADM is a not-for-profit corporation without share capital and is responsible for the management, operation, and development of Montréal–Pierre Elliott Trudeau International Airport and Montréal–Mirabel International Airport under the terms of a 60-year lease signed with Transport Canada in 1992. The Case Study was conducted at the offices of ADM, from 8:00 AM to 2:00 PM on May 23, 2014. The purpose for the meeting was to investigate further the topics briefly discussed during a previous Telephone meeting between Frank Barich (ACRP Research Team Member – Lead Researcher) and Antoine Rostworowski. Meeting notes from the telephone meeting are included in Attachment 1. Research Team Members conducting the Case Study were Frank Barich and Peter Longoria.

The ADM sponsor, Mr. Antoine Rostworowski, coordinated a four-hour interview meeting, including also Mr. Eric Montplaisir. Antoine is Director of Industry Relations for ADM. In this capacity, Antoine maintains a good understanding of where the industry is going with regard to technology and operational best practices and trends. He then shares this knowledge with ADM’s airport management, thus improving the decision making process. Antoine also works as manager for ADM services; an independent consulting services that exposes ADM staff to international experiences and consulting opportunities. Eric Montplaisir is the Deputy Director for product and services development. In this capacity, Eric is responsible for the passenger processes; for operational and passenger benefits.

Antoine also participated in the IATA Passenger Experience Management Group (PEMG) workshop, earlier in the week. The results of this workshop are captured in Case Study 3b.



## Case Study Objectives

Based on secondary research on YUL, as well as an initial phone interview with the ADM Sponsor, the Team discovered useful information and valuable opportunities which identified YUL as a strong case study subjects. ADM has also explored the collection and use of passenger based data; also a key item for the case study work. The added benefit of participating in the IATA PEMG workshop provided further support of this as a case study objective. This case study entails the following objectives:

- Understand as best as possible, the process in which an airport or airline chooses to introduce passenger self-services
- Evaluate the basis behind the planning and implementation of specific self-services
- Document the means in which the airport or airline measures the benefit of self-services, including discussing cost consideration affecting self-service initiatives.
- Understand the integrated components that may exist between the services, and the collaboration opportunities between airport and airline(s)
- Understand better the collection and use of passenger data
- Inquire about future self-service initiatives, either planned or considered

## Research Approach

To meet the objectives, the Team compiled a series of comprehensive worksheets and preparation documents designed to help facilitate the flow of meetings and collection of information. This documentation was discussed and sent to the case study coordinators prior to the actual on-site visit. Survey information was received and included within the notes in Attachment 1.

Once on site, the Research Team engaged with the noted two ADM delegates during a four-hour interview. In addition, an airport site walk was conducted as a part of PEMG Workshop (Report 3b) to experience the self-service efforts first hand.

## KEY HIGHLIGHTS/TAKE-AWAYS

This Case Study achieved very valuable results for the development of the project Guidebook.

## Vision/Mission/Values

Aéroports de Montréal's vision is expressed in these statements:

- *ADM aims to become an airport manager ranking among the best in the world, distinguished by the quality of its customer service as well as its rigour, efficiency, and innovation.*



- *Montréal-Trudeau will expand its role as a continental gateway and a dynamic hub for passenger traffic between Europe and the Americas.*
- *Montréal-Mirabel will continue to develop so as to consolidate its status as a world-class aerospace and logistics platform.*

*Building on experience and past successes, a seasoned team, and a flair for commercial and technological innovation, ADM plans to resume its consulting activities and win contracts to manage other airports.*

Aéroports de Montréal's mission is threefold:

- *Provide quality airport services that are safe, secure, efficient and consistent with the specific needs of the community.*
- *Foster economic development in the Greater Montréal Area, especially through the development of facilities for which it is responsible.*
- *Coexist in harmony with the surrounding environment, particularly in matters of environmental protection.*

*Aéroports de Montréal is committed to succeeding in each of its sectors — airport, aeronautical, real estate and commercial services — and to developing its airport complexes to their full potential. From this perspective, Montréal-Trudeau acts as a hub for domestic, transborder and international passenger traffic, while Montréal-Mirabel will continue to grow as an industrial and all-cargo airport.*

Aéroports de Montréal's is operating according the following 5 values:

1. Team spirit - *Co-operating with other team members, placing the team's objectives above personal goals, contributing ideas with the aim of improving team cohesiveness and effectiveness, sharing information, listening to others' viewpoints, promoting consensus.*

2. Respect for others - *Paying attention to colleagues' needs, concerns and ideas, defining and acknowledging each team member's role and responsibilities, giving every individual the opportunity to develop, encouraging the sense of initiative, treating everyone fairly regardless of their rank in the corporate hierarchy, challenging ideas, not people.*

3. Thoroughness and perseverance - *Making decisions in accordance with corporate policies, staying on course to attain objectives despite obstacles, establishing and observing strict procedures for every action, monitoring and following up to ensure adherence to budgets, schedules and procedures, leading by example.*

*4. Loyalty and integrity - Honouring commitments and keeping promises, acting honestly and ethically in every situation, observing social and corporate standards, speaking frankly, admitting mistakes, refusing to tolerate complacency, respecting confidentiality.*

*5. Innovation and creativity - Constantly being on the lookout for innovative solutions that have the potential to improve performance, taking advantage of and managing opportunities, remaining open to change and new ideas, being undaunted by risk, adapting new trends and ideas to personal circumstances.*

## **Airport Culture:**

Key take-aways regarding the Airport Culture included:

- ADM is dedicated to common use.
- Current emphasis on non-airline revenues.
- There is an emphasis on how to become more efficient on technology, infrastructure, and staff/organization.
- Passenger Transfer is on the increase:
  - Passenger demographic is changing, with transfer passenger traffic increasing to approximately 14%.
  - With this increase, ADM is starting to look at what they can do to make passenger dwell time experience more pleasant. Until now the volume has been too low to make it worth their time. Real estate, especially on international areas, is very expensive.
  - Airport competition comes from Vancouver, Boston, New York, Chicago for getting to Europe and Asia.
  - The key is how to reduce minimum waiting time for transfer passengers.
- ADM thinks it is the role of the airport to get involved with passenger flow and airline process issues. ADM believes the Airport should play a role in making changes even if it's an airline "thing" to build what will be needed in the future and to help talk with government entities even if it's an airline request. It's easier for the airport to talk to the regulators representing the airlines than for the regulators to talk with each airline.
- ADM believes that passengers want choices and each service responds to a specific need so they keep a number of services.

## **Business Cases/Budget**

To get a project moved through the approval process, you must build a business case. We have started justifying all of our new technology/process through a well established business case. Key point to consider include:

- Do it improve our common use model?



- Does it improve the passenger experience?
- Does it improve passenger processing
- We aim for zero cost. If there is a cost, it must be accompanied by a solid ROI showing an increase in non-Aeronautical revenue or high cost deferral in capital expenditures
- What is the value related to innovation – We want to innovate, but not necessarily on everything. Innovation in the passenger experience, flow and capacity is a good thing.

In considering the passenger experience, it is a challenge to try and determine if passenger experience translates directly into spending more money. Some initiatives are easier to track, such as with improved Web options for purchasing goods. Most are not as easy. As a result, we attempt to weight the passenger experience with the cost of the project.

To help in providing justification related to passenger services, we conduct or use various forms of surveys throughout the year. We place a lot of importance on survey results in the decision making process. Use of surveys include:

- Internal ADM passenger satisfaction survey: About 9,000 per year done in a continuous way, through use of staff.
- ACI general ASQ airport survey: 500 surveys done for each yearly quarter (total of 2,000 per year)
- ACI Retail specific ASQ airport survey: 1,000 surveys done twice a year (total of 2,000 per year)
- Various other ad-hoc passenger surveys: An average of about 4 to 5 surveys per year (accomplished using people with clip boards, or iPads.)

Passenger self service has high management support from the top down. One of our first objectives is to be the leading airport in efforts for the passenger experience. We want to serve as a reference for the passenger processing and experience, thus having an impact on the region.

Budget: projects are planned over next 4-7 years. There is annual budget for items like replacing an AP, a CUSS kiosk, etc. and will reserve / plan for those operational funds. There is a budget also associated with passenger experience, ambiance, operational efficiencies, and other related items.

## Passenger Service Project Approach

Most of our project initiatives are through the strategic planning process. We recently used the efforts of two 3rd party providers to help prepare our strategic plan. Projects get



approved through a committee and they are the ones that prioritize and ensure it fits into the airport's strategic plan.

We typically conduct project pilots/trials. If we prove success through the project pilots, then we begin rolling it out on a larger scale. We are finding manufacturers and solution providers are more open to supporting pilots and sharing in the project risks and expenses.

## Data Analysis / Sharing

ADM is collecting a large amount of data but at present, they are not doing much with it. One area where ADM is conducting data analysis is in analyzing passenger spending. Such analysis is being conducted based on passengers on a specific flight so ADM can ensure they provide the right products and services near the flights with the passengers that are going to buy them. Not using any geolocation services right now.

ADM knows the benefit of data analysis is there, so data collection continues to expand. Most of the data analysis of the benefits is done in-house. When necessary, ADM will bring in 3rd parties to provide expert analysis or input. They have grown to a better understanding and approach to the "Big Data" concept. In other words, they collect the data from all projects; then analyze it from various perspectives to try to figure out how it can be used and integrated in other ways.

Understanding that data is important, changes the dynamics of project requirements, including:

- New project initiatives have to be able to integrate with existing systems
- Considering the data uses and sharing, help to reduce duplicate processes and sometimes project initiatives
- Projects are evaluated based on how the project supports or improves key performance indicators (KPI) and what data is needed to justify such support. As a result, the type of data collected can also become a part of the business case.
  - Data on retail sales
  - Operational data for allocation of gates and flights
- Collection of data and the use of it may impact change to the IT infrastructure – as a result, each project is evaluated for such impacts
- Projects have to assess the management of data. ADM has more people working on organizing the database than ever before, due to project changes.

There are challenges in data collection; none of which can't be overcome. These include:

- We would like to get and share data with CATSA but not there yet – we continue to meet and discuss opportunities



- Data sharing is a very political topic – who owns the data; how to mask unnecessary data, etc. – we are making positive strides with the airlines and other agencies on this topic, but more conversations are required.
- Security screening and customs: this is where a lot of the bottlenecks are today. If data sharing is more accessible then may solve a lot of issues.

When it comes to data sharing, we know it will arrive and are working to ensure the technical piece will not be something that blocks this when the politics are worked out. We are working to make sure we have what is required from an IT perspective.

## IT Architecture

Starting last year, ADM realized their need to change IT infrastructure to be ready for the future with more stable infrastructure for systems. As a result, all IT infrastructure is in process of being changed. If they did not start the change, ADM would be “behind the curve” with regard to new system projections, and would not be able to stabilize and make use of the data. As such, ADM is setting up a bus architecture. Last year, ADM replaced the core switching with a new CISCO Nexus core switch.

ADM also made significant improvements to the airport wireless infrastructure, including several upgrades to the terminal wireless. To meet the needs of the new types of aircraft that have specific types of wireless communication as the aircraft arrives (ex. download the operational and commercial information), ADM is in the process of deploying WiFi at the gates and throughout the airfield. ADM is installing a microwave technology based system throughout the airfield for web connection to passengers, ramp services, operations, resale services, maintenance information, etc.

With the work accomplished on the wireless, ADM is now reevaluating the means to can generate more revenue, while keeping passenger use free of charge.

System redundancy is important. At present, there is redundancy within the airport; plans are to construct a new server room hosted off campus, but not into the cloud.

## Self-Service Initiatives

### Common Use:

The culture of YUL is common use. ADM considers all self service projects from a common use perspective. The consideration has been to own the "system" if they feel multiple airlines are going to use it. Two of which include the Common Use Self Service Kiosk (CUSS), and the Common Use Self Bag drop.

1. Wayfinding has been added to the CUSS kiosks; known as the Airport Concierge. Every CUSS kiosk now has wayfinding. Wayfinding is passenger specific based on boarding area. Once wayfinding is selected, the passenger is provided a map which will display



location of the passenger's gate and the walking time. The passenger has the option of pushing this map to his/her cell phone.

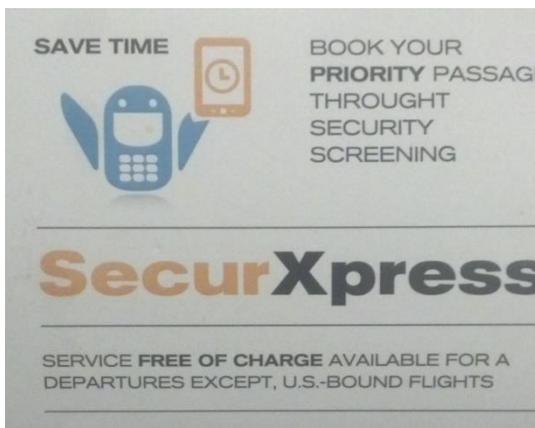
2. For Transborder use, ADM has installed the first unassisted Common Use Bag drop system in the world. ADM realized the bag drop function is becoming more generic and



will eventually move off campus. As such, they decided to use this momentum to install a series of bag drop locations behind the Transborder Check-In counters. These bag drops are fully common use, in that a passenger can select any location available to him/her. ADM expects the ROI will come in next 3-5+ years and not in short term. Once completed, this bag drop system is designed to be a two-step process, where the passenger prints the bag tag at the kiosk and applies the tag, and then proceeds to the bag drop. Today, it is more of a 3-step process, where the passenger (after applying the tag) proceeds to the counter, where for some airlines, the agent then weighs the bag. The Agent then directs the passenger to the bag drop area.

ADM worked with TSA to develop template for the airline to fill out for a request to do self service bag drop. This helps make the process more efficient. ADM firmly believes the airport needs to get involved. ADM is exploring similar bag drop solutions on the domestic and international boarding area. ADM is currently piloting a bag drop solution with WetJet.

### Fast Pass Queuing



ADM has just deployed a queue line “fastpass” process known as “SecurXpress”. The purpose for this service is to allow departing passengers the ability to reserve a time to go through security checking. This new system requires the passenger to:

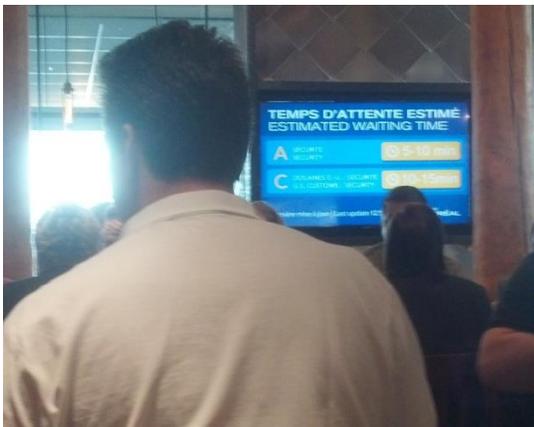
1. Book on-line for a maximum of five people.
2. Confirm their inscription by replying to an SMS.
3. Show up at the appointed time, at the SecurXpress line.

When the passenger books on-line, he/she can reserve parking spots at a discounted rate. This service is currently available only through the website. ADM realizes that people who use the airport often will not download the app and those that are new to the airport will go to the website, rather than downloading an app. This service is free of charge and currently is available for all departures, except U.S.

The primary business driver for ADM was from a public relations perspective. If it is successful, the ADM hopes to flatten the peak queuing of passengers. ADM provides links for airlines for its specific check-in sites. Although it is primarily a basic solution, ADM expects that popularity of the system will grow as airlines see the benefits. In the near future, airlines are going to offer more choices from a process perspective. Different airlines want to offer different combinations of things, such as:

- security queue time
- time to get to gate
- time when airline is going to start boarding

#### Improved Passenger Information on Wait Times:



ADM sets a yearly target goal for impact on passenger wait times, mainly for transborder departures. Along with measuring wait times, ADM is improving how and where to display wait time information. The picture below show a wait time display installed in one of the Terminals dining areas.

For ADM, anywhere there's queuing that's where you want to target innovation and efficiencies.

## **Other Passenger Services**

ADM is working on other passenger related services, including the following:

1. Airport ambiance. ADM has setup a pilot program for music with the local university. ADM is also working with Montreal Studios to setup a video game area for items manufactured here locally.
2. Digital Signage Improvements: ADM has installed improved digital signage, design around improving the experience for the younger ages.

## Automated Border Control (ABC)

Automated border control (ABC) provides an accelerated process for the majority of passengers. ADM has installed the Vancouver solution.

ADM chose to pay for the system because it was a good investment for passenger processing and positioning the Airport. There still is some debate as to who owns it. The system was deployed in June and has 12 kiosks. Immediately throughput increased, and satisfaction went thru the roof.

From the same real estate space ADM drastically increased throughput, which made the business case easy. Just adding this piece showed customer satisfaction increase at the queue line but also showed increase in satisfaction after security and in the shopping areas, even though ADM didn't change anything at that point. This is evident of passenger the intangible benefit of having the passenger more relaxed.

## Tool Review

Prior to the close of the Case Study Session, ADM and Research Team members discuss the potential tools that may be produced as a part of the ACRP guidebook. The following comments were noted:

- Recommend providing a clear definition of self service . Clarify why self service? Can provide better service and offer choices. Self service helps passengers that want to go fast and less interaction and allows passengers who need more help to get it. Self service frees agents to spend the time with the passengers that need it without being rushed.
- Is the airport looking to improve process or add channels for self service? What are you aiming to do? Is it more on transaction base? Is it more on building a database of different users?
- Helping to build the business case would be helpful to Montreal even as mature as they are because it could be an additional validation of their analysis. Suggestions include:
  - Create a profile that can continue to be added to.
  - Gain aspect on self service
  - Use as a business case
  - Use to educate others within an airport

ADM said they would be happy to provide feedback on the tool as it's being developed.

## ATTACHMENT 1

### Telephone Interview / Survey Notes

#### Interview Session:

Antoine Rostworowski – ADM

#### Interview Objectives

This interview is a part of the preliminary research efforts of the project. In this initial effort, interviews are conducted with airports of known progress in Passenger Self-Service Initiatives. The information collected during the interviews will provide the following:

1. Identify self-service operations available at various airports world-wide
2. Demographics of Airports today implementing self service solutions
3. An understanding of the evaluation, and strategic decision making process regarding an integrated Self-Service program for the airport
4. Benefits and impacts resulting from the self-service installations
5. A better understanding of the direction airports are taking in these areas
6. Identify airport/airline case study opportunities for more detailed research in subsequent project tasks

#### Interview Discussion Points

##### A. Self-Service Applications in Place Today – for the noted systems:

- *Self-service check-in*
- *Common use bag drop - will be the first to have unassisted CU Bag Drop (in Transborder area)*
- *Automated Passport Control (Vancouver solution)*
- *Main focus is to start with a list of menu for the passenger as they approach. Certain tools include:*
  - *As the Passengers arrive, we use our Web site heavily*
    - *Offer various services such flight information and alerts using SMS – passengers punch in the flight number, type in if they want an alert for time.*
    - *Another option – Secure Express – being able through the Web to enter flight # and register for a secure time to “fast track” security (like Disney). This helps to flatten the peaks.*



- *We added 2 months ago – parking reservations with fee in advance – regular price to those who show up and offer specialty pricing for advanced. Different services.*
- *Weather, roads, traffic information – all in the planning*
- *Mobile web site – up to date.*
- *Responsive design – (being built – launch in March) Website adapts to the specific hardware being used and according to where the passenger is logging on. Using wireless and other location-based services.*
- *Part of the upgraded website, offering the passenger certain tools depending on travel and the passenger's profile. We are offering a preferred reward program.*
- *Off-site check-in. Our vision is that the on-site check in process is disappearing. All checked-in. Home printed bag tags – temporary. Permanent (RFID) is where things are going. Not outside of airport bag drop at this time. We did some are cruise boats and we have a project for a direct shuttle – when that opens in a couple of years, we will want it there. We are looking at places in parking lots and trial downtown.*
- *We have common use SS bag drops in the Transport terminal – we started pilot with WestJet. 2-step process. We just deployed all the bag drops self-service. We hope to replicate in domestic and international.*
- *For landside dwell – we have tons of data on wait times, etc., so we are providing the passenger the process times on the Web / mobile and displayed on-site. Same thing for customs and at baggage delivery and Canadian customs. For integration – as part of our common use kiosks – as you finish check-in, you have an option for a map to your gate and get the process time and QR code for getting it on your mobile.*
- *Dual location through Wi-Fi – something in the future and to integrate that as well, using the mobile as GPS – opt-in type of approach with marketing coupons. Not there yet.*
- *Not really done much with equipping airport ambassadors. We know some are doing it. So we are in the process of questioning ourselves as to what are the best ways. Mobile tools seem to make best sense, but we don't want to duplicate the airline's work.*
- *Security is managed by CATSA, which are fairly pro-active. We have several queuing options: Nexus members have a fastrack, and looking as a self-*

*service access for Nexus; family queuing, those who register on the Web; regular queuing. Also looking at “check-point of the future.”*

- *We have always put an emphasis on departures, but we started to look at arrivals. There are very good opportunities to influence government.*
- *Re-booking / boarding – working with airlines, yes.*
- *Airside dwell time – we still have quite a bit more landside. We have physical limitations to our building on airside. Spa massage, business centers, rest areas – we are looking at that. Looking at passenger opt-in programs – providing specific information to the passenger – is a direction we are going, augmented reality, etc. – We are not there yet.*
- *Arrivals – traditionally, passengers were arriving, going through customs, getting their baggage and leaving. But working with customs, we started working with automated process. Our line ups reduced from over an hour, to less than 20 minutes and passenger satisfaction went extremely high. We worked with other customs areas. We had looked at the entire process. Wait time at customs (Canadian-US), wait time at baggage carousels; automated gates at the downstream of customs after baggage collection and handing off of card.*
- *Social Media – we are doing it and are doing a few contests. We have about 20k members. Also: YouTube and Facebook.*

## B. Airport Strategic Objectives

### 1. Airport management culture

#### a. Attitude towards risk

- i. *About 10 years ago, we decide to put innovation in the forefront, which changed our approach. We decided to move to 100% common use and reduce the cost of Cap-x and infrastructure.*
- ii. *At that time, there was resistance .*
- iii. *Since that time, culture has changed to where if we want to become more effective, then innovation and technology was the only way. This drove change.*
- iv. *We really focused on certain key technologies and innovations*
  - a. *We did not want to be the innovators in everything*
  - b. *We identified key performance indicators and focused on these*
  - c. *We worked through pilots*

#### b. Decision making process





## ATTACHMENT 1

### Case Study Agenda

Date & Time	Content
19 May Mon 11:00	<u>Meeting 1</u> <u>Terminal Logistics</u>
	<b><u>AMS delegate</u></b> <b>Ms. Marianne van Scherpenzeel</b> , Manager Terminal Logistics, Passenger Services
14:00	<u>Meeting 2</u> <u>KLM E-Commerce</u>
	<b><u>KLM delegate</u></b> <b>Mr. Rob Zwerink</b> , Director E-Development
15:00	<u>Meeting 3</u> <u>E-Business</u>
	<b><u>AMS delegate</u></b> <b>Ms. Christa Bakker</b> , Manger E-Business
16:00-19:00	<u>Airport Tour (Terminal Building)</u> <i>Suggested route:</i> <i>Arrivals and Schiphol Plaza Common Use Kiosks → Departures KLM Self Bag Drop, Self-Service Border Control → Departures Common Use Self-Bag Drop, Self-Service Security Checkpoint Queue Access → Privium Lounge Self-Service Border Control → (move to airside) → KLM Self-Service Transfer Kiosks → Security Checkpoint Customized Screening Conveyor System</i>
	<b><u>AMS delegate</u></b> <b>Mr. Kees Jans</b> , Chief Information Officer
19:00-21:00	<u>Dinner</u>
	<b><u>AMS delegate</u></b> <b>Mr. Kees Jans</b> , Chief Information Officer
21:00	End

# **ACRP**

## **Project 10-17**

### **Implementing Integrated Self-Service at Airports**

#### **Task 3c:**

#### **Case Study Report #3b**

#### **Montréal–Pierre Elliott Trudeau International Airport (YUL)**

TRANSPORTATION RESEARCH BOARD  
NAS-NRC

Submitted by:

**Barich, Inc.**

## INTRODUCTION

This Case Study Report (Report) documents the findings of the case study with Aéroports de Montréal (ADM) staff, managing the Montréal–Pierre Elliott Trudeau International Airport (YUL). This Report contains the information collected during the discussions with the ADM staff. Although detailed analysis of the information collected will be conducted in a later task, this Report provides preliminary analyses to present relevance to the overall project objective.

The information contained herein is crucial for developing the framework for the Guidebook, especially the final section “Key Highlights/Take-Aways”, which highlight very valuable information and specific areas where information will continue to be assimilated for use with the Guidebook.

## BACKGROUND

### Entities/Location/Attendance

ADM is a not-for-profit corporation without share capital and is responsible for the management, operation, and development of Montréal–Pierre Elliott Trudeau International Airport and Montréal–Mirabel International Airport under the terms of a 60-year lease signed with Transport Canada in 1992. The Case Study was conducted at the offices of ADM, from 8:00 AM to 2:00 PM on May 23, 2014. The purpose for the meeting was to investigate further the topics briefly discussed during a previous Telephone meeting between Frank Barich (ACRP Research Team Member – Lead Researcher) and Antoine Rostworowski. Meeting notes from the telephone meeting are included in Attachment 1. Research Team Members conducting the Case Study were Frank Barich as well as Peter Longoria and Ron Hiscox (Team Researcher Members).

The ADM sponsor, Mr. Antoine Rostworowski, coordinated a four-hour interview meeting, including also Mr. Eric Montplaisir. Antoine is Director of Industry Relations for ADM. In this capacity, Antoine maintains a good understanding of where the industry is going with regard to technology and operational best practices and trends. He then shares this knowledge with ADM’s airport management, thus improving the decision making process. Antoine also works as manager for ADM services; an independent consulting services that exposes ADM staff to international experiences and consulting opportunities. Eric Montplaisir is the Deputy Director for product and services development. In this capacity, Eric is responsible for the passenger processes; for operational and passenger benefits.

Antoine also participated in the IATA Passenger Experience Management Group (PEMG) workshop, earlier in the week. The results of this workshop are captured in Case Study 3a.



## Case Study Objectives

Based on secondary research on YUL, as well as an initial phone interview with the ADM Sponsor, the Team discovered useful information and valuable opportunities which identified YUL as a strong case study subjects. ADM has also explored the collection and use of passenger based data; also a key item for the case study work. The added benefit of participating in the IATA PEMG workshop provided further support of this as a case study objective. This case study entails the following objectives:

- Understand as best as possible, the process in which an airport or airline chooses to introduce passenger self-services
- Evaluate the basis behind the planning and implementation of specific self-services
- Document the means in which the airport or airline measures the benefit of self-services, including discussing cost consideration affecting self-service initiatives.
- Understand the integrated components that may exist between the services, and the collaboration opportunities between airport and airline(s)
- Understand better the collection and use of passenger data
- Inquire about future self-service initiatives, either planned or considered

## Research Approach

To meet the objectives, the Team compiled a series of comprehensive worksheets and preparation documents designed to help facilitate the flow of meetings and collection of information. This documentation was discussed and sent to the case study coordinators prior to the actual on-site visit. Survey information was received and included within the notes in Attachment 1.

Once on site, the Research Team engaged with the noted two ADM delegates during a four-hour interview. In addition, an airport site walk was conducted as a part of PEMG Work shop (Report 3a) to experience the self-service efforts first hand.

## KEY HIGHLIGHTS/TAKE-AWAYS

This Case Study achieved very valuable results for the development of the project Guidebook.

## Vision/Mission/Values

Aéroports de Montréal's vision is expressed in these statements:



- *ADM aims to become an airport manager ranking among the best in the world, distinguished by the quality of its customer service as well as its rigour, efficiency, and innovation.*
- *Montréal-Trudeau will expand its role as a continental gateway and a dynamic hub for passenger traffic between Europe and the Americas.*
- *Montréal-Mirabel will continue to develop so as to consolidate its status as a world-class aerospace and logistics platform.*

*Building on experience and past successes, a seasoned team, and a flair for commercial and technological innovation, ADM plans to resume its consulting activities and win contracts to manage other airports.*

Aéroports de Montréal's mission is threefold:

- *Provide quality airport services that are safe, secure, efficient and consistent with the specific needs of the community.*
- *Foster economic development in the Greater Montréal Area, especially through the development of facilities for which it is responsible.*
- *Coexist in harmony with the surrounding environment, particularly in matters of environmental protection.*

*Aéroports de Montréal is committed to succeeding in each of its sectors — airport, aeronautical, real estate and commercial services — and to developing its airport complexes to their full potential. From this perspective, Montréal-Trudeau acts as a hub for domestic, transborder and international passenger traffic, while Montréal-Mirabel will continue to grow as an industrial and all-cargo airport.*

Aéroports de Montréal's is operating according the following 5 values:

*1. Team spirit - Co-operating with other team members, placing the team's objectives above personal goals, contributing ideas with the aim of improving team cohesiveness and effectiveness, sharing information, listening to others' viewpoints, promoting consensus.*

*2. Respect for others - Paying attention to colleagues' needs, concerns and ideas, defining and acknowledging each team member's role and responsibilities, giving every individual the opportunity to develop, encouraging the sense of initiative, treating everyone fairly regardless of their rank in the corporate hierarchy, challenging ideas, not people.*

*3. Thoroughness and perseverance - Making decisions in accordance with corporate policies, staying on course to attain objectives despite obstacles, establishing and observing strict procedures for every action, monitoring and following up to ensure adherence to budgets, schedules and procedures, leading by example.*

*4. Loyalty and integrity - Honouring commitments and keeping promises, acting honestly and ethically in every situation, observing social and corporate standards, speaking frankly, admitting mistakes, refusing to tolerate complacency, respecting confidentiality.*

*5. Innovation and creativity - Constantly being on the lookout for innovative solutions that have the potential to improve performance, taking advantage of and managing opportunities, remaining open to change and new ideas, being undaunted by risk, adapting new trends and ideas to personal circumstances.*

## **Airport Culture:**

Key take-aways regarding the Airport Culture included:

- ADM is dedicated to common use.
- Current emphasis is on non-airline revenues.
- There is an emphasis on how to become more efficient in regard to technology, infrastructure, and staff/organization.
- Passenger Transfer is on the increase:
  - Passenger demographic is changing, with transfer passenger traffic increasing to approximately 14%.
  - With this increase, ADM is starting to look at what they can do to make passenger dwell time experience more pleasant. Until now, the volume has been too low to make it worth their time. Real estate, especially in international areas, is very expensive.
  - Airport competition – for getting to Europe and Asia – comes from Vancouver, Boston, New York, and Chicago.
  - The key is how to reduce minimum waiting time for transfer passengers.
- ADM thinks it is the role of the Airport to get involved with passenger flow and airline process issues. ADM believes the Airport should play a role in making changes – even if it's an airline "thing" -- to build what will be needed in the future and to help talk with government entities even if it's an airline request. It's easier for the Airport to talk to the regulators representing the airlines than for the regulators to talk with each airline.
- ADM believes that passengers want choices and each service responds to a specific need, therefore ADM offers a number of different services.

## **Business Cases/Budget**



### *Business Cases*

To get a project moved through the approval process, ADM staff must build a business case. ADM has started justifying all of the new technology/processes through a well established business case. Key points to consider include:

- Does it improve the common use model?
- Does it improve the passenger experience?
- Does it improve passenger processing?
- ADM aims for zero cost. If there is a cost, it must be accompanied by a solid ROI showing an increase in non-aeronautical revenue or high cost deferral in capital expenditures.
- What is the value related to innovation?—ADM wants to innovate, but not necessarily on everything. Innovation in passenger experience, flow, and capacity is, however, a good thing.

In considering the passenger experience, it is a challenge to try and determine if it translates directly into spending more money. Some initiatives, such as with improved Web options for purchasing goods, are easier to track. Most initiatives, however, are not as easy to track. As a result, ADM attempts to weight the passenger experience with the cost of the project.

To order to help in providing justification related to passenger services, ADM conducts or uses various forms of surveys throughout the year. They place much importance on survey results in the decision making process. The use of surveys includes:

- Internal ADM passenger satisfaction survey: About 9,000 per year done in a continuous way, through use of staff.
- ACI General ASQ airport survey: 500 surveys done for each yearly quarter (total of 2,000 per year)
- ACI Retail-specific ASQ airport survey: 1,000 surveys done twice a year (total of 2,000 per year)
- Various other ad-hoc passenger surveys: An average of about 4 to 5 surveys per year (accomplished using people with clip boards, or iPads).

Passenger self-service has high management support from the top down. One of ADM's first objectives is to be the leading the Airport in efforts for the improving passenger experience. ADM wants to serve as a reference for the passenger processing and experience, thus having an impact on the region.

### *Budget*

Projects are planned over next 4-7 years. There is annual budget for items, such as replacing an AP and a CUSS kiosk, for example, and ADM will reserve / plan for those



operational funds. There is also a budget associated with passenger experience, ambiance, operational efficiencies, and other related items.

## Passenger Service Project Approach

Most of ADM's project initiatives are through the strategic planning process. ADM recently used the efforts of two 3<sup>rd</sup> party providers to help prepare the Airport's strategic plan. Projects are approved through a committee who prioritize and ensure they align with the strategic plan.

ADM typically conducts project pilots/trials. If they prove successful, ADM will begin rolling them out on a larger scale. ADM finds manufacturers and solution providers are more open to supporting pilots and sharing in the project risks and expenses.

## Data Analysis / Sharing

ADM is collecting a large amount of data but at present, they are not doing much with it. One area where ADM is conducting data analysis is in analyzing passenger spending. Such analysis is being conducted based on passengers on a specific flight so ADM can ensure they provide the right products and services near the flights with the passengers that are going to buy them. ADM is not using any geolocation services right now.

ADM is aware of the benefit of data analysis; so data collection continues to expand. Most of the data analysis of the benefits is done in-house. When necessary, ADM will bring in 3<sup>rd</sup> parties to provide expert analysis or input. They have grown to a better understanding and approach to the "Big Data" concept. In other words, they collect the data from all projects; then analyze it from various perspectives to try to figure out how it can be used and integrated in other ways.

Understanding that data is important changes the dynamics of project requirements, including:

- New project initiatives have to be able to integrate with existing systems.
- Considering the data uses and sharing, helps to reduce duplicate processes and sometimes project initiatives.
- Projects are evaluated based on how the project supports or improves key performance indicators (KPI) and what data is needed to justify such support. As a result, the type of data collected can also become a part of the business case:
  - Data on retail sales
  - Operational data for allocation of gates and flights
- Collection of data and the use of it may impact changes to the IT infrastructure – as a result, each project is evaluated for such impacts.
- Projects have to assess the management of data. ADM has more people working on organizing the database than ever before, due to project changes.



There are challenges in data collection; none of which can't be overcome. These challenges include:

- ADM would like to get and share data with CATSA, but they are not there yet – they continue to meet and discuss opportunities.
- Data sharing is a very political topic, who owns the data; how to mask unnecessary data, etc. They are making positive strides with the airlines and other agencies on this topic, but more conversations are required.
- Security screening and customs: this is where a lot of the bottlenecks are today. If data sharing is more accessible then that may solve a lot of such issues.

When it comes to data sharing, ADM knows it will get a handle on it. They are working to ensure the technical piece will not be a roadblock once the politics are worked out. ADM is working to make sure they have what is required from an IT perspective.

## IT Architecture

Starting last year, ADM realized their need to change their IT infrastructure to be ready for the future with a more stable infrastructure for systems. As a result, all IT infrastructure is in the process of being changed. If ADM did not initiate the change, they would be “behind the curve” with regard to new system projections, and would not be able to stabilize and make use of the data. As such, ADM is setting up a bus architecture. Last year, ADM replaced the core switching with a new CISCO Nexus core switch.

ADM also made significant improvements to the airport wireless infrastructure, including several upgrades to the terminal wireless. To meet the needs of new types of aircraft that have specific types of wireless communication as the aircraft arrives (ex. download the operational and commercial information), ADM is in the process of deploying WiFi at the gates and throughout the airfield. ADM is installing a microwave technology based system throughout the airfield for web connection to passengers, ramp services, operations, resale services, maintenance information, etc.

With the work accomplished on the wireless infrastructure, ADM is now reevaluating the means to generate more revenue, while keeping passenger use free of charge.

System redundancy is important. At present, there is redundancy within the airport. There are plans to construct a new server room hosted off campus, but not into the cloud.

## Self-Service Initiatives

The culture of YUL is common use. ADM considers all self-service projects from a common use perspective. The consideration has been to own the "system" if they feel multiple airlines are going to use it. Two of which include the Common Use Self Service Kiosk (CUSS), and the Common Use Self Bag Drop. The following describe some self-services initiatives in details



1. Wayfinding. Wayfinding has been added to the CUSS kiosks; known as the Airport Concierge. Every CUSS kiosk now has wayfinding. Wayfinding is passenger-specific based on the boarding area. Once wayfinding is selected, the passenger is provided a map which will display location of the passenger's gate and the walking time to get there. The passenger has the option of "pushing" this map to his/her cell phone.

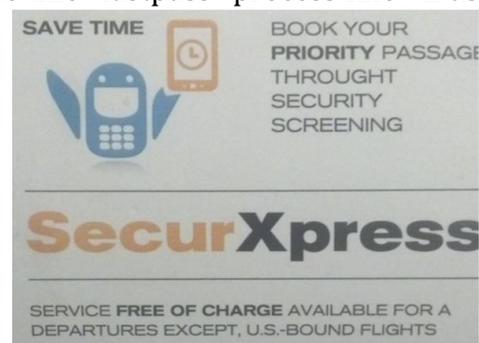
2. Common Use Bag Drop. For Transborder use, ADM has installed the first unassisted Common Use Bag Drop system in the world, as shown in the photo. ADM realized the bag drop function is becoming more generic and will eventually move off campus. As such, they decided to use this momentum to install a series of bag drop locations behind the Transborder Check-In counters. These bag drops are fully common use, in that a passenger can select any location available to him/her. ADM expects the ROI will come in the next 3-5+ years and not in the short term. Once completed, this bag drop system is designed to be a two-step process, where the passenger prints the bag tag at the kiosk, applies the tag, and then proceeds to the bag drop. Today, it is more of a 3-step process, where the passenger (after applying the tag) proceeds to the counter, where for some airlines, the agent weighs the bag. The Agent then directs the passenger to the bag drop area.



ADM worked with the TSA to develop a template for the airline to fill out for a request to do a self-service bag drop. This helps to make the process more efficient. ADM firmly believes the airport needs to get involved. ADM is exploring similar bag drop solutions in the domestic and international boarding area. ADM is currently piloting a bag drop solution with WestJet.

3. Fast Pass Queuing. ADM has just deployed a queue line "fastpass" process known as "SecurXpress" (see picture on the right). The purpose for this service is to allow departing passengers the ability to reserve a time to go through security checking. This new system requires the passenger to:

1. Book on-line for a maximum of five people.
2. Confirm their inscription by replying to an SMS.
3. Show up at the SecurXpress line at the appointed time.

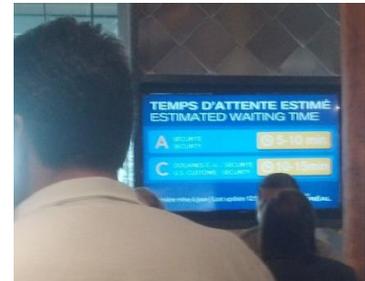


When the passenger books on-line, he/she can reserve parking spots at a discounted rate. This service is currently available only through the website. ADM realizes that people who use the airport often will not download the app and those that are new to the airport will go to the website, rather than downloading an app. This service is free of charge and currently is available for all departures, except to the U.S.

The primary business driver for ADM was from a public relations perspective. If it is successful, the ADM hopes to flatten the peak queuing of passengers. ADM provides links for airlines for its specific check-in sites. Although it is primarily a basic solution, ADM expects that the popularity of the system will grow as airlines see the benefits. In the near future, airlines are going to offer more choices from a process perspective. Different airlines want to offer different combinations of things, such as:

- Security queue time
- Time to get to gate
- Time when airline is going to start boarding

4. Improved Passenger Information on Wait Times. ADM sets a yearly target goal for impact on passenger wait times, mainly for Transborder departures. Along with measuring wait times, ADM is improving how and where to display wait time information. The picture on the right shows a wait time display installed in one of the Terminals dining areas. For ADM, where ever there is queuing, there they want to target innovation and efficiencies.



## Other Passenger Services

ADM is working on other passenger related services, including the following:

1. Airport Ambiance: ADM has setup a pilot program for music with the local university. They are also working with Montreal Studios to setup a video game area for items manufactured here locally.
2. Digital Signage Improvements: ADM has installed improved digital signage, designed around improving the experience for the younger ages.

## Automated Border Control (ABC)

Automated Border Control (ABC) provides an accelerated process for the majority of passengers. ADM has installed the solution implemented at Vancouver.

ADM chose to pay for the system because it was a good investment for passenger processing and for positioning the Airport. There still is, however, a debate as to who owns it. The system was deployed in June and has 12 kiosks. Immediately throughput increased and satisfaction “went through the roof.”

From the same real estate space, ADM drastically increased throughput, which made the business case easy. Simply adding this system increased customer satisfaction at the queue line. It also increased satisfaction after security and in the shopping areas, even though ADM didn't change anything in those areas. This attests to the intangible benefit of having the passenger more relaxed.

## Tool Review

Prior to the close of the Case Study Session, ADM and Research Team members discussed the potential tools that may be produced as a part of the ACRP Guidebook. The following comments were noted:

- Recommend providing a clear definition of self-service. Include also the benefits, such as it can provide better service and offer more choices. Self-service puts the passenger in control and enables the passengers that want to travel quickly and want less interaction. In addition, self-service frees up agents to assist passengers that need help without being rushed.
- Is the airport looking to improve processes or add channels for self-service? What are the airports aiming to do? Is the focus on transactions? Or is it more on building a database of different users?
- Assisting to build the business case would be helpful to YUL although they are already mature, because it could be an additional validation of their analysis. Suggestions include:
  - Build a profile that can continue to be added to
  - Gain aspect on self-service
  - Use as a business case
  - Use to educate others within the airport

ADM said they would be happy to provide feedback on the tools as they are continued to be developed.

## ATTACHMENT 1

### Telephone Interview / Survey Notes

#### Interview Session:

Antoine Rostworowski – ADM

#### Interview Objectives

This interview is a part of the preliminary research efforts of the project. In this initial effort, interviews are conducted with airports of known progress in Passenger Self-Service Initiatives. The information collected during the interviews will provide the following:

1. Identify self-service operations available at various airports world-wide
2. Demographics of Airports today implementing self service solutions
3. An understanding of the evaluation, and strategic decision making process regarding an integrated Self-Service program for the airport
4. Benefits and impacts resulting from the self-service installations
5. A better understanding of the direction airports are taking in these areas
6. Identify airport/airline case study opportunities for more detailed research in subsequent project tasks

#### Interview Discussion Points

##### A. Self-Service Applications in Place Today – for the noted systems:

- *Self-service check-in*
- *Common use bag drop - will be the first to have unassisted CU Bag Drop (in Transborder area)*
- *Automated Passport Control (Vancouver solution)*
- *Main focus is to start with a list of menu for the passenger as they approach. Certain tools include:*
  - *As the Passengers arrive, we use our Web site heavily*
    - *Offer various services such flight information and alerts using SMS – passengers punch in the flight number, type in if they want an alert for time.*
    - *Another option – Secure Express – being able through the Web to enter flight # and register for a secure time to “fast track” security (like Disney). This helps to flatten the peaks.*



- *We added 2 months ago – parking reservations with fee in advance – regular price to those who show up and offer specialty pricing for advanced. Different services.*
- *Weather, roads, traffic information – all in the planning*
- *Mobile web site – up to date.*
- *Responsive design – (being built – launch in March) Website adapts to the specific hardware being used and according to where the passenger is logging on. Using wireless and other location-based services.*
- *Part of the upgraded website, offering the passenger certain tools depending on travel and the passenger's profile. We are offering a preferred reward program.*
- *Off-site check-in. Our vision is that the on-site check in process is disappearing. All checked-in. Home printed bag tags – temporary. Permanent (RFID) is where things are going. Not outside of airport bag drop at this time. We did some are cruise boats and we have a project for a direct shuttle – when that opens in a couple of years, we will want it there. We are looking at places in parking lots and trial downtown.*
- *We have common use SS bag drops in the Transport terminal – we started pilot with WestJet. 2-step process. We just deployed all the bag drops self-service. We hope to replicate in domestic and international.*
- *For landside dwell – we have tons of data on wait times, etc., so we are providing the passenger the process times on the Web / mobile and displayed on-site. Same thing for customs and at baggage delivery and Canadian customs. For integration – as part of our common use kiosks – as you finish check-in, you have an option for a map to your gate and get the process time and QR code for getting it on your mobile.*
- *Dual location through Wi-Fi – something in the future and to integrate that as well, using the mobile as GPS – opt-in type of approach with marketing coupons. Not there yet.*
- *Not really done much with equipping airport ambassadors. We know some are doing it. So we are in the process of questioning ourselves as to what are the best ways. Mobile tools seem to make best sense, but we don't want to duplicate the airline's work.*
- *Security is managed by CATSA, which are fairly pro-active. We have several queuing options: Nexus members have a fastrack, and looking as a self-*

*service access for Nexus; family queuing, those who register on the Web; regular queuing. Also looking at “check-point of the future.”*

- *We have always put an emphasis on departures, but we started to look at arrivals. There are very good opportunities to influence government.*
- *Re-booking / boarding – working with airlines, yes.*
- *Airside dwell time – we still have quite a bit more landside. We have physical limitations to our building on airside. Spa massage, business centers, rest areas – we are looking at that. Looking at passenger opt-in programs – providing specific information to the passenger – is a direction we are going, augmented reality, etc. – We are not there yet.*
- *Arrivals – traditionally, passengers were arriving, going through customs, getting their baggage and leaving. But working with customs, we started working with automated process. Our line ups reduced from over an hour, to less than 20 minutes and passenger satisfaction went extremely high. We worked with other customs areas. We had looked at the entire process. Wait time at customs (Canadian-US), wait time at baggage carousels; automated gates at the downstream of customs after baggage collection and handing off of card.*
- *Social Media – we are doing it and are doing a few contests. We have about 20k members. Also: YouTube and Facebook.*

## B. Airport Strategic Objectives

### 1. Airport management culture

#### a. Attitude towards risk

- i. *About 10 years ago, we decide to put innovation in the forefront, which changed our approach. We decided to move to 100% common use and reduce the cost of Cap-x and infrastructure.*
- ii. *At that time, there was resistance .*
- iii. *Since that time, culture has changed to where if we want to become more effective, then innovation and technology was the only way. This drove change.*
- iv. *We really focused on certain key technologies and innovations*
  - a. *We did not want to be the innovators in everything*
  - b. *We identified key performance indicators and focused on these*
  - c. *We worked through pilots*

#### b. Decision making process





**ACRP**

**Project 10-17**

**Implementing Integrated  
Self-Service at Airports**

**Task 3d:**

**Case Study Report #4a**

**Seattle-Tacoma International Airport  
(SEA)**

TRANSPORTATION RESEARCH BOARD  
NAS-NRC

Submitted by:

**Barich, Inc.**

## INTRODUCTION

This Case Study Report (Report) documents the findings of the case study with the Seattle-Tacoma International Airport (SEA). This Report contains the information collected during the site walks, presentations, and discussions with the SEA delegates. Although detailed analysis of the information collected will be conducted in a separate task, this Report provides preliminary analyses to present relevance to the overall project objective.

The information contained herein is crucial for the development the framework for the Guidebook, especially the final section “Key Highlights/Take-Aways”, which highlight very valuable information and proposes specific areas where information will continue to be assimilated for use with the Guidebook.

## BACKGROUND

### Entities/Location/Attendance

The Case Study was conducted at the SEA offices from 8:30 AM to 5:00 PM on June 3, 2014 and 10:00 AM to 3:00 PM on June 4, 2014. The Agenda for the Case Study is included as Attachment 1. Research Team Member conducting the Case Study was Justin Phy (Principal Investigator). A complete list of the SEA Delegates that participated in the Case Study is included in the Agenda (Attachment 1).

### Case Study Objectives

This case study entails the following objectives:

- Understand the process in which SEA chooses to introduce passenger self-services
- Evaluate the basis behind the implementation of specific self-services
- Document the means in which the airport or airline measures the benefit of self-services
- Understand infrastructure requirements for implementing passenger self-service initiatives
- Understand data integration efforts
- Understand and document lessons learned regarding efforts in implementing and using Wireless Location-based Services
- Get a better understanding how social media supports self-services
- Inquire about future self-service initiatives, either planned or considered

### Research Approach

To meet the objectives, the Team had compiled a series of comprehensive worksheets and preparation documents designed to help facilitate the flow of meetings and collection of



information. This documentation was discussed and sent to the case study coordinators prior to the actual on-site visit.

The SEA sponsor, Dave Wilson provided extensive support in setting up interview sessions and facilitating all meetings and walkthroughs. Once on site, the Research Team engaged with the various SEA delegates during a variety of meetings and workshops, which included presentations, discussions, and interviews. In addition, an airport site walk was conducted to experience the self-service efforts first hand.

## KEY HIGHLIGHTS/TAKE-AWAYS

This Case Study achieved very valuable results for the development of the project Guidebook.

### Airport Strategic Focus

SEA takes a top-down strategic approach to defining all initiatives within the airport. As such, there is a clear alignment from the Airport's Purpose and Strategic Goals to the Technology Strategies, from the Technology Strategies to the Technology Objectives, and from the Technology Objectives and the Airport's Investment Drivers to specific Initiatives.



SEA has three key Technology Strategies that all support passenger self-services:

1. Anticipate and plan for **innovation** in consumer and aviation technology
2. Encourage adoption of advances in **customer service** technology (ACI, ASQ, IATA)
3. Create a **culture** of technology enthusiasts and data driven decision making

SEA defines Technology Objectives in support of each Technology Strategy, for example:

1. Innovation – Create an ideal mobile device environment
2. Customer Service – Support airline self-service initiatives
3. Tech Savvy Culture – Support future business plan actions

SEA has seven Investment Drivers that influence specific initiatives over time:

1. “Keeping Up” (replace/upgrade)
2. NorthSTAR (North Satellite)
3. South Satellite (FIS)
4. Fast Travel (disruptive technologies)
5. Business Plan
6. Simplifying the Business (StB)
7. Checkpoint of the Future with Array Motion Imaging

### Technology to be integrated in business planning



## IATA

IATA Fast Travel has significant implications for facilities planning to enable “Self-service Everything.” SEA is a strong supporter of IATA Fast Travel and embraces it as a “Disruptive Technology” that is driving self-services. They closely track advances proposed by the IATA Passenger Experience Management Group.



SEA notes four implications STB 2011:

- Mobile devices will play an increasing important role in the travel experience
  - Although touch screen kiosks remain an IATA priority
- Increased interoperability between business partners is required for the future traveler
  - Requires new data communication standard
  - Reduces the proprietary nature of PAX handling systems
- Secure data sharing is required between airlines, airports, and governments
  - Curb to gate requires tighter real-time system integration
- IATA STB has renewed emphasis on data exchange protocols – seamless integration

### IATA's New Travel Experience is Mobile



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## Mobility Strategy

SEA is embracing the fact that mobile devices are rapidly evolving, and airlines are counting on them to revitalize the passenger experience. They have developed a detailed mobility strategy to ensure that passengers are both well informed and well prepared for their airport travel experience and that the Airport anticipates and keeps abreast of mobile device innovation by making sound technology investments in passenger mobility infrastructure. The strategy includes the following four goals:

Mobile Ecosystem Support - Support airline and third party software developers (ISV) - the passenger mobile app ecosystem

Unique Mobile User Experience - Create a unique mobile experience for passengers with location aware apps and HTML5 web sites

Real-Time Information Broker - Automate the delivery of real-time information for mobile users; create revenue generating products

Robust Wireless Infrastructure - Provide a robust wireless network for mobile users in the 802.11 and LTE radio frequencies

For each of these goals, SEA has developed a set of specific objectives and strategies for achieving each.



SEA takes the position that smart phones are integral to the passenger experience:

- Check-in process available on your device
  - Boarding pass, rebooking, upgrades seat assignment changes, real-time flight information
- Smart Phone boarding pass
  - Used at airline or common bag drop locations
  - Scanned by TSA in checkpoint – 2D bar code or NFC
  - Used to board at gate including self-boarding devices
- Flight and bag claim information
  - Visual paging possible via Smart Phone notifications
- Location-aware, enhanced way finding and targeted concession advertisements – require Smart Phones

In addition, it is believed that mobile devices will reduce the cost of operations and maintenance by replacing the paper processes being used today.

#### The future of way finding fits in your palm



2014 Vision

Airport Strategic Technology Plan

Game Engines will power way finding



Used for motion along horizontal plane  
(forward, backward, side step)

Used for viewing plane  
(up, down, left, right)

Virtual Airport Way-finding



2014 Vision

Airport Strategic Technology Plan

## ATTACHMENT 1

### Case Study Agenda

#### ACRP 10-17 Case Study on Passenger Self-Service

##### Case Study Objectives

"Understand as best as possible, the process in which an airport or airline chooses to introduce passenger self-services; evaluate the basis behind the implementation of specific self-services; document the means in which the airport or airline measures the benefit of self services; understand the integrated components that may exist between the services, and the collaboration opportunities between airport and airline(s)

##### Specific to Seattle

Understand infrastructure requirements for implementing passenger self-service initiatives; understand data integration efforts; understand and document lessons learned regarding efforts in implementing and using Wireless Location-based Services

#### Day 1 - June 3<sup>rd</sup>

**Tokyo** 8:30 – 9:45 Introduction, Logistics, Tour

Dave Wilson

**Tokyo** 10:00 – 12:00 Workshop on Passenger Journey – Self Service

Nick Harrison, Arland Fagerstrum, Todd Vangerpen, Jim Witzman and Dave Wilson

**TBD** 12:00 – 13:00 Lunch

**Tokyo** 13:00 – 14:00 TSA and CBP Self-Service

Wendy Reiter, Chris Samlaska, Nick Harrison, Charles Goedken\* and Dave Wilson

**Tokyo** 15:00- 16:00 Self-Service Financial Review

Borgan Anderson and Dave Wilson

#### Day 2 - June 4<sup>th</sup>

**AOB-4B** 10:00-11:00 Social Media and Self-Service

Mandy Oh, Mandy Sulman and Dave Wilson

**AOB-3B** 12:00-13:00 Workshop on Passenger Journey – Self Service \*\*

Gary Richer and Dave Wilson

**AOB-5B** 15:00-16:00 Self-Service Planning

Nick Harrison, Dave Tomber and Dave Wilson

**5<sup>th</sup> Floor** 16:00- 15:00 Wrap Up

Dave Wilson



# **ACRP**

## **Project 10-17**

### **Implementing Integrated Self-Service at Airports**

#### **Task 3d:**

#### **Case Study Report #4b**

#### **Toronto Pearson International Airport (YYZ)**

TRANSPORTATION RESEARCH BOARD  
NAS-NRC

Submitted by:

**Barich, Inc.**

## INTRODUCTION

This Case Study Report (Report) documents the findings of the case study with the Greater Toronto Airports Authority (GTAA), managing the Toronto Pearson International Airport (YYZ). This Report contains the information collected during the discussions with the GTAA staff, along with information known by the Research Team, through its on-going contract with the GTAA.

The information contained herein is crucial for developing the framework for the Guidebook, especially related to the need for integrated technologies.

## BACKGROUND

### Entities/Location/Attendance

The Greater Toronto Airports Authority (GTAA) is a private company which operates as a non-share corporation. It has the mandate to operate Toronto Pearson International Airport within a regional system of airports to enhance economic growth and development of the GTAA and to deliver outstanding aviation facilities to its customers, including air carriers and passengers.

The GTAA has continued to evolve as an organization since its incorporation in 1996 when it was split from Transport Canada. In 1997, the GTAA embarked on a 10-year, \$4.5 billion Airport Development Program (ADP) which was the single largest capital program in the history of Canadian airports and resulted in the construction of a world class facility. Upon the completion of the ADP in 2007, the corporation turned its focus from construction to operations to ensure the company was set up effectively to fully leverage its investment. In late 2009, the GTAA developed a brand strategy for Toronto Pearson with the following vision and mission and values all designed around shifting Toronto Pearson from being an airport operator to a commercially driven service provider:

**Vision** - *To be North America's premier portal to the world of possibilities.*

**Mission** - *To attract, serve and delight our customers by offering value through innovative products and services.*

**Values** - *Integrity, accountability, excellence, teamwork/collaboration and stewardship.*

In addressing the customer experience and in Passenger Services, the following three GTAA departments work very closely together.

1. Information Technology Management (ITM) - ITM is responsible for the Information and Communication Technology (ICT) infrastructure that powers the airport.
2. Operations and Customer Experience Group - The Operations and Customer Experience Group manages all of the processes that support the day-to-day



operation of the airport. As one of the largest departments within the GTAA, its functions include:

- Airside Operations
  - Consolidated Communication Centre
  - Customer Experience
  - Deicing Operations
  - Emergency Services
  - Groundside Operations
  - Resource Management Unit
  - Terminal Operations
  - Safety & Security
3. Strategic Planning and Airport Development - The Strategic Planning and Airport Development department is responsible for conducting benchmarking activities with other airports and industries. This team conducts research on current and emerging trends to assess potential impacts and opportunities for the GTAA. This data is used to plan the future growth and development of Toronto Pearson.

## Case Study Objectives

Based on Team member understanding of the environment at YYZ, as well as ongoing discussions with GTAA staff, the Team discovered useful information and valuable opportunities which identified YYZ as a strong case study subject. This case study was accomplished through the noted discussions and some site visit work, through the Team's ongoing contract. This case study entails the following objectives:

- Understand as best as possible, the process in which an airport prepares its IT environment for the collection and use of airport operational and passenger data
- Understand the integrated components that may exist between the services, and the collaboration opportunities between airport and airline(s)
- Understand better the collection and use of passenger data
- Inquire about future self-service initiatives, either planned or considered

## Research Approach

The Team compiled previously collected information related to the GTAA IT environment and planned service upgrades. This case study documentation was discussed and sent to the GTAA for review, comments, and approval of information presented.

## KEY HIGHLIGHTS/TAKE-AWAYS

### The Need for Change

As the GTAA moved towards Operational Excellence, advancing toward its goals and visions set forth in 2009, it had become increasingly obvious that change was needed in how the GTAA managed and used data. The GTAA recognized that change was required to align with the global market and direction of technology. The GTAA required an overall system designed around industry standards and vastly improved capabilities in the sharing and use of data.

As the ITM pursued the opportunity of better utilizing a modern IT Architecture to support the GTAA's vision of becoming a true global hub airport, the GTAA also worked towards upgrading its existing IT Infrastructure towards a modern infrastructure consisting of the following:

- Message Broker / Enterprise Service Bus
- Service Oriented Architecture (SOA) messaging
- Industry based standards including XML schema objects and web services
- Enterprise wide Business Intelligence (BI)
- Virtualized server environment
- Enterprise Document Management System

The timely collection and use of information was the core basis behind improving the current IT environment. The GTAA required an information-sharing system that would allow the airport operator access to accurate, systematically collected and processed information, and the ability to share this information with stakeholders as well as the ability to act on this shared information. Through such a system, the airport operator could effectively plan operations up to 72 hours in advance, and within that time period to proactively evolve the plan to account for changes in demand or available capacity due to weather, facility unavailability or other unanticipated circumstances. Through such a system, the GTAA recognized that it would also improve the general quality of service provided to its customers, passengers and guests, and open up many opportunities of new passenger services, based on improved demographics.

The GTAA therefore in 2010 set out to establish an IT environment on the basis of information to be 'recorded once and used many', relying on its Enterprise Service Bus to simultaneously transfer information to the relevant applications and client interfaces. In doing so, the GTAA wanted to eliminate the current manual processes, integrate existing stand-alone systems and establish a stable enterprise solution that will support a central repository for information collection and storage, web-based controls and optimized resource management.



Such an environment would allow the most up-to-date information to be available in real-time, ensuring both operations and passengers are in possession of the latest information upon which to make decisions. Essential to this system would be a highly reliable and robust network, associated with an airport operational database (AODB) and management information system (MIS) for storing and prioritizing the quality use of the information. This system will need to allow both the airport operational team and the wider airport community to view real time dashboards with user specific Key Performance Indicators (KPIs).

The final vision for the GTAA's IT environment was to establish a reliable and stable system, and through integration with other GTAA systems create an enterprise tool allowing visibility to airport's day-to-day and historical activities. Through the implementation of a Terminal AODB, the GTAA will be able to analyze and improve on passenger flow. Through the integrated / enterprise solution, the GTAA will have the ability to improve utilization of airport assets (assign gates based on day-of-operations need. E.g.: Flights with connection passengers with minimum connection time to transfer to their next flight.

### **Progress as of 2014**

As of August, 2014, the GTAA is well on the path to seeing its IT environment vision completed. Work to the IT infrastructure improvements is ongoing, with some notable achievements, including passenger wait time analysis. Expected by the end of 2014, the GTAA will have an IT based operations system that enables many of the following benefits:

- Dashboards that will display such items as counter allocations; gate allocations; sector usage; In-bound baggage carousels and out-bound lateral usage; connection passengers/destination or sectors accessed; trending – actual vs. planned; dwell time in various retail locations; passenger demographics, etc.
- Sharing key information with air carriers for wait times and passenger locations for improved decision making capabilities.
- Optimized use and allocation of in-bound baggage carousels and out-bound laterals that provide a better understanding of infrastructure usage and overall air carrier and ground handler performance details.
- Optimized transfer baggage processes based on real-time accurate data.
- Ability to better facilitate connections and to optimize services to create a better guest experience.
- Passengers will have visibility to expected wait times, such as at security checkpoints, or the wait times at USCBP or CBSA.
- Passengers will have a more comprehensive view of Toronto Pearson's services (retail, food and beverage, etc.) that they can utilize during their visit.

## **The Future State**

The improved IT environment and information-sharing system has already begun to unlock the “doors of possibility”. With the available information and infrastructure, future Passenger Self Services initiatives can now be planned for and implemented in far greater cost efficiencies and opportunities than ever before. One such example, the integration of an automated parking guidance system in order to provide information to the passengers, via a display screens at the Consolidated Communication Centre and on a Dashboard that can be accessed from any airport terminal. Passenger could access information on available parking spots by location. Such a system will give the GTAA the ability to forecast parking requirements, and using its available technologies, to direct customers and guests to available parking locations.

# **ACRP**

## **Project 10-17**

### **Implementing Integrated Self-Service at Airports**

#### **Task 3e:**

#### **Case Study Report #5a**

#### **Geneva International Airport (GVA)**

TRANSPORTATION RESEARCH BOARD  
NAS-NRC

Submitted by:

**Barich, Inc.**

## INTRODUCTION

This Case Study Report (Report) documents the findings of the case study with Genève Aéroport. This Report contains the information collected during the discussions with the Genève Aéroport staff. Although detailed analysis of the information collected will be conducted in a later task, this Report provides preliminary analyses to present relevance to the overall project objective.

The information contained herein is crucial for developing the framework for the Guidebook, especially considering the entire passenger journey, and the planning that goes into determining self services across the journey.

## BACKGROUND

### Entities/Location/Attendance

Genève Aéroport is the name of the Independent Public Establishment that manages Geneva airport. Its main activities include aeronautical operations, apron control, planning and building, maintenance and cleaning, safety and security, the running of the car parks, administration, financial management, business and buildings management, marketing, environmental management, and human resources management.

The Case Study was conducted at the offices of Genève Aéroport, from 10:00 AM to 5:30 PM on September 27, 2014. The purpose for the meetings was to investigate the passenger self service initiatives at Geneva Airport, and to learn more of the planning process for such services. Research Team Members conducting the Case Study were Frank Barich and Ron Hiscox. The primary Genève Aéroport staff included Thomas Romig - Head of Airport Steering, and Jacques Morgenegg – Director of Landside Operations, and Airport Sponsor for this case study.

To gain a better understanding of the planning for passenger self services, the Airport Sponsor, coordinated a two-hour interview meeting, between Thomas Romig and the ACRP Research Team members. This meeting was followed by a four-hour session with the Airport Sponsor, Jacques Morgenegg to discuss specific Passenger Self Service initiatives, and to conduct a site walk of the airport.

### Case Study Objectives

Based on preliminary research and Team member understanding of the Geneva Airport, the Team discovered useful information and valuable opportunities which identified GVA as a strong case study subject, particularly due to its continued need of efficiently processing passengers through a highly congested facility. In 2007 the airport processed 10.8 million passengers. At that time, the airport underwent a major transformation, including the extension of the main terminal, new departure lounge, and security checkpoint enhancements.



Since that time, the passenger growth continues to occur at rates greater than expected. In 2013, the Airport reached 14.4 million. As noted by Thomas, over the last ten years, passenger traffic has almost doubled. Along with the recent and planned facility enhancements, Genève Aéroport has also deployed a series of very successful passenger self services to help accommodate the passenger flow. With this as the background, this case study achieved the following objectives:

- Understand as best as possible, the process in which an airport or airline chooses to introduce passenger self-services
- Evaluate the basis behind the planning and implementation of specific self-services
- Document the means in which the airport or airline measures the benefit of self-services, including discussing cost consideration affecting self-service initiatives.
- Understand the integrated components that may exist between the services, and the collaboration opportunities between airport and airline(s)
- Understand better the collection and use of passenger data
- Inquire about future self-service initiatives, either planned or considered

## Research Approach

To meet the objectives, the Team prepared an agenda in coordination with the Airport Sponsor. Following the meetings and on site surveys, the Team requested supplemental survey information related to:

- Pictures of the facility prior to the recent deployment of self boarding gates
- Dashboard and ASQ performance measurement parameters
- Financial Benefit Parameters
- Terminal Regulation Book

Based on the positive response from the Airport Sponsor, the Team anticipates receiving this information for use with the subsequent detailed analysis portions of the project.

## KEY HIGHLIGHTS/TAKE-AWAYS

This Case Study achieved very valuable results for the development of the project Guidebook.

## Vision/Mission/Values

Genève Aéroport is committed to succeeding in developing its airport facility to its full potential and satisfaction of it the people who use it. From this perspective, the following mission statements are provided.

Thomas Romig, in charge of Airport Steering maintains the following Mission:



Task 3e: Case Study Report #5a – GVA  
Transportation Research Board  
September 27, 2014

- To maintain the performance, punctuality and smooth flow of airport operations and the quality of services to customers of Genève Aéroport.
- To ensure continuing airport authority, including by ensuring the availability of a standby service.
- To coordinate and plan operational activities between the services of Genève Aéroport and partners so as to ensure optimised flows and operational safety.
- To manage, organise and coordinate emergency situations.
- To present an image of airport activities that are up-to-date and appropriate to the operating situation.
- To monitor airport activities in order to improve the service to customers, especially punctuality.
- To keep partners and passengers informed.

**Information and Communications Technologies maintains the following Mission:**

- To implement, maintain and develop Genève Aéroport's IT infrastructure and telecommunications systems.
- To improve and simplify airport processes by the application of appropriate information and communications technologies.
- To propose information systems appropriate to the needs of Genève Aéroport and its customers, and to provide their support and development.
- To provide users with a suitable computerised working environment and ensure its proper functioning and use.

**Airport Culture:**

Key take-aways regarding the Airport Culture included:

- Genève Aéroport is dedicated to common use.
- Demographics:
  - 14 million passengers a year and is the hub for Easyjet and Swiss International Airlines
    - Growth is steady and is expected to 4% or greater for passenger counts, and 2% or greater for aircraft movements
  - Two passenger terminals, T1 and T2.
    - T1 is divided into 5 piers, A, B, C, D and F. All of the gates at Pier A, and some of the gates at Pier D, are Schengen gates.
    - T1 Gates at pier B, C, and some at pier D, are used for flights to destinations outside the Schengen area.
    - T2 is used during the winter charter season
  - 57 airlines, with key airline percentages, approximately as follows:
    - Easyjet – 40%



- Swiss – 20%
- AirFrance, British Airways, Iberia – 12%
- Remaining 52 airlines – 28%
- Airport competition –
  - competition for transfer passengers comes from the major European hubs including Frankfurt, Amsterdam, and Paris
  - Local competition comes from Lausanne Airport, which is just 1.5 hour drive away. Passengers often weigh the pros/cons of flying through the busy Geneva Airport, compared to the ease of flying through Lausanne Airport.

## **Business Need / Project Organization / Business Cases**

### *Business Need*

To evaluate performance and business needs, Genève Aéroport starts with establishing a baseline using the ACI ASQ program, then we add our own Key Performance Indicators (KPI). The Airport Steering group (under Airport Operations), headed up by Thomas Romig is responsible for defining and monitoring all KPIs, and for establishing the business cases for future project needs. In monitoring progress, they establish trends and look for the areas of concern, using the Red, Yellow, Green color codes to help define hot spots.

### *Project Organization – for Project Definition*

To establish the business need and project identification, Genève Aéroport has put together a project organization that helps to facilitate project definition and priorities. This organization starts from Airport Operations, and then through close business relations with IT, translates into projects. Since the project definition begins with Operations, project prioritization and ultimate project approval is accomplished quite successfully. Once the high priority is established, the projects typically move forward. The following is the general breakdown:

1. Operations Steering
  - a. There is a Project Management System in place that helps to define the need. This “System” works with Capacity Studies and Planning for input
  - b. The needs are coordinated through the Airport Operations Control Center, responsible for Performance Monitoring and monitoring of capacities.
  - c. Genève Aéroport is in the process of launching an Airport Coordination Center that will include representation from Airside, Landside, and other relevant parties, to allow a collective review of project requirements.
  - d. Next year, Genève Aéroport is also setting up a series of performance review meetings, in coordination with this effort
  - e. Results of the monitoring effort are fed back into the electronic KPIs and consolidated into a Dashboard for management review
2. Information and Communications Technologies (ICT)



- a. Project needs from Operations Steering are the Passed down to ICT for Operations Planning and project definition
  - b. ICT works in coordination with Operations Steering and the IT Airport Innovation group to help define the project
  - c. Depending on project size, Genève Aéroport will initiate project pilots to prove the project definition and need
3. IT Airport Innovation
    - a. Works in coordination with both Operations Steering and ICT

### *Business Case*

In considering the passenger experience, it is a challenge to try and determine if it translates directly into spending more money. Some initiatives, such as with improved Web options for purchasing goods, are easier to track. Most initiatives, however, are not as easy to track. As a result, Genève Aéroport attempts to weight the passenger experience with the cost of the project.

surveys:

- ACI General ASQ airport survey: 500 surveys done for each yearly quarter (total of 2,000 per year)

Passenger self-service has high management support from the top down.

### *Budget*

Projects are planned over next xx years.

## **Passenger Service Project Approach**

When considering passenger self services, Genève Aéroport considers the need of the passenger through the following five process steps:

1. Pre-Arrival
2. Arrival
3. Security Checks
4. Airside
5. Boarding

In these five journey points, all passengers process through the airport; whether the passenger is destination based or transfer passenger. If the passenger is a transfer passenger, then these five process steps are evaluated to see where the passenger ints in when and where in the 5 steps. Genève Aéroport is in the process of measuring total



Passenger Processing Time across all 5 steps. This extensive effort involves Genève Aéroport Marketing and considers comparison values with ASQ ratings.

Projects are considered both from within any of the five steps, or across some / all the process steps. With the airport often in an highly congested condition, Genève Aéroport considers and manages all projects against a common infrastructure for all passengers, allowing for the greatest approach to improved efficiencies. Within each of the five steps, Genève Aéroport recognizes that the passenger will have options as to how to flow through the airport.

Genève Aéroport typically conducts project pilots/trials. If they prove successful, Genève Aéroport will begin rolling them out on a larger scale. When considering projects within the five process steps, Genève Aéroport recognizes that it is the needs of the airline that may provide additional complexity. How a passenger travels through the airport, and how each airline's needs in addressing their specific passengers must be assessed in the project. For example, one airline may require multiple check-in desk configurations (elite traveler, web check-in traveler, all others...), while the next airline accommodates all passengers through one basic check-in approach.

Regardless the complexity, each project is considered against the following criteria:

- KPIs
- Architectural
- IT
- Management
- Competition

Genève Aéroport has initiated a new program known as "Seamless Travel", where this program is currently considering project initiatives under the Arrival and Boarding process steps. This program is expanding and has plans to consider project initiatives in the future across all process steps. Ongoing and future projects are discussed in the "Self Services Initiatives" section of this case study report.

## Data Analysis / Sharing

Genève Aéroport is collecting a large amount of data

ADM is aware of the benefit of data analysis;

Understanding that data is important changes the dynamics of project requirements, including:

- New project initiatives have to be able to integrate with existing systems.



- Projects are evaluated based on how the project supports or improves key performance indicators (KPI) and what data is needed to justify such support. As a result, the type of data collected can also become a part of the business case:

There are challenges in data collection; none of which can't be overcome. These challenges include:

- Data sharing is a very political topic, who owns the data;

## Self-Service Initiatives

Genève Aéroport Self Service Initiatives are presented below, under the five process steps, and also under "Common Infrastructure", which may apply across all process steps.

### 1. Common Infrastructure Projects

#### 1.1 – The Geneva Mobile App



Genève Aéroport has introduced a mobile app for both the Android and IOS (iPhone / iPad) platforms. Many of the functions on the App can also be performed on the Website. Current functions of the App include:

**Viewing flight status** – Check status on every flight from or to Genève Aéroport on the same or the next day. The flight number, check-in counters, boarding gate, airline, and type of aircraft are among the items of information available in the flight details.

**Flight tracking** - Track any flight from or to Genève Aéroport. Tracking enables you to gain easy access to the flight details, and also to be notified of each change of status (push) and to activate the personal guide.

**Guide** – Static and real-time updates for passenger safety, boarding gate or next trains, or buses. All the key steps, on departure or arrival, are presented in the form of a check list.

**Interactive map** - Provides a relief map of the airport.

**Shops** - Descriptive details of the shops; view practical information or add it to favorites. Can display shop details on on the map and view the route to get there.

**Parkings** - View car-park availability and calculate rates. Provides ability to “remember where you parked.”

**Transport** - On arriving in Geneva, view directly the next bus and train departures from the airport. All items of practical information about taxis, free hotel shuttle buses or car hire are also available.

**Other information** - Weather forecast for the next 5 days!

**Multi-Lingual** - French, German and English

**Future Upgrades** – Working on a Geo-referenced navigation tool. Today, it is just a map layout.

2. Pre-Arrival
3. Arrival
4. Security Checks
5. Airside
6. Boarding

# **ACRP**

## **Project 10-17**

### **Implementing Integrated Self-Service at Airports**

#### **Task 3e:**

#### **Case Study Report #5b**

**Frankfurt International Airport**

**(FRA)**

**ACI World IT Standing Committee –  
ACRIS Working Group**

TRANSPORTATION RESEARCH BOARD  
NAS-NRC

Submitted by:

**Barich, Inc.**

## INTRODUCTION

This Case Study Report (Report) documents the findings of the case study with Fraport and the meetings held, while in Frankfurt, during the ACI World IT ACRIS Working Group meetings. Although detailed analysis of the information collected will be conducted in a later task, this Report provides preliminary analyses to present relevance to the overall project objective.

The information contained herein is crucial for developing the framework for the Guidebook, especially considering the entire passenger journey, and the planning that goes into determining self services across the journey.

## BACKGROUND

### Entities/Location/Attendance

Fraport is among the leading groups of companies in the international airport business. With Frankfurt Airport, the company operates one of the world's most important air transportation hubs. Frankfurt Airport has become Germany's third largest airport, with more than 58 million passengers a year travelling through its two terminals.

As an experienced airport manager, Fraport is expanding Frankfurt Airport together with partners into Frankfurt Airport City – an outstanding real-estate location and gateway of mobility and excitement.

The Case Study was conducted at the offices of Fraport, during the days of September 23 and 24, from 9:00 AM to 5:00 PM. The case study included attendance of ACI World IT ACRIS (Airport Community Recommended Information Services) Working Group meetings, and interviews conducted with Dr. Rolf Felkel, Manager of IT. The purpose for the case study was two-fold:

1. To attend the ACRIS meetings, which had an emphasis on common data exchange, related to passenger processing and self services
2. To investigate the passenger self service initiatives at Frankfurt Airport, and to learn more of the planning process for such services.

Research Team Members conducting the Case Study were Frank Barich and Ron Hiscox.



## Case Study Objectives

In attending the ACI ACRIS meetings, the team focus was in participating in joint discussions related to the following topics (detailed meeting notes will be received at a later date for analysis):

- Cooperation of ACI and IATA on web services
  - Status of Passenger and Baggage Conformance Services
  - Common Use Web Services and PADIS
- Status of ACRIS Seamless Travel Core Group
  - Presentation and Discussion from Munich Airport on their initiatives with Passenger Self Services
  - Which services in focus
  - Proof of Concept definition, next steps and draft milestones
- Concepts of the Passenger as the “Batch of One”
  - Looking at Passenger Self Services from the eyes of each passenger
  - Data requirements needed to support this process

Related to Frankfurt Airport, and based on preliminary research and Team member understanding of the Airport, the Team discovered useful information and valuable opportunities which identified FRA as a strong case study subject, particularly due to its continued need of efficiently processing passengers through a highly congested facility.

With this as the background, this case study achieved the following objectives:

- Understand as best as possible, the process in which an airport or airline chooses to introduce passenger self-services
- Evaluate the basis behind the planning and implementation of specific self-services
- Understand the integrated components that may exist between the services, and the collaboration opportunities between airport and airline(s)
- Understand better the collection and use of passenger data
- Inquire about future self-service initiatives, either planned or considered

## Research Approach

To meet the objectives, the Team prepared an agenda in coordination with the Airport Sponsor. Following the meetings, the Team will receive detailed minutes and presentation notes covering all meetings.



## KEY HIGHLIGHTS/TAKE-AWAYS

This Case Study achieved very valuable results for the development of the project Guidebook.

### Vision/Mission/Values

We professionally develop mobility, making it an exciting experience for our customers. As an airport group we are the most strongly performing player in all business segments of the industry.

- For Fraport, airports are worlds of excitement as well as intermodal hubs. We systematically link different modes of transportation.
- At all our locations process efficiency and innovation is our hallmark. Our success is based on competitive integrated services, which flexibly meet our customers' requirements.
- Our top priority is safety and security.
- In pursuing our business, we create sustainable value for the benefit of our shareholders, employees, and the regions where we are located.

### Airport Culture:

As part of the "Great to have you here!" initiative, Frankfurt Airport has been optimizing many aspects since 2010. They include waits at the security checkpoints, signage in the terminals, display of walking times to gates, the friendliness of personnel and much more. Fraport achieved its goal of a passenger satisfaction index of 80% by 2015 as early as 2012 and continued it through 2013. In 2013, Frankfurt Airport had a baggage performance index of only two misrouted pieces of baggage per 1,000. The punctuality rate at Frankfurt Airport in 2013 was excellent, reaching 82.3% despite greater air traffic volumes.

Key demographic take-aways regarding the Airport Culture included:

- The airport is a common use airport, utilizing the SITA Club arrangement
- 58 million passengers
  - Third largest airport in Europe and number 12, worldwide
- The airport is considered a key connecting hub, with transfer passengers at approximately 55%
- About 89% of all passengers take international flights
- Greater than 470,000 aircraft movements
- Two passenger terminals, T1 and T2.
- 108 airlines
- Airport competition – competition for transfer passengers comes from the major European hubs including Geneva, Amsterdam, and Paris



## Business Need / Project Organization / Business Cases

### *Business Need*

Business need is established through the following:

1. Passenger input through surveys
2. Evaluation of competition airports
3. Input from key airlines and other stakeholders
4. Comparison ratings from Skytrax

For Point four (Skytrax ratings), Frankfurt Airport's primary airline, Lufthansa approached Fraport with a desire to reach the five-star ranking for airlines. For Lufthansa to reach this goal, Fraport recognized that the Airport must also reach a five-star ranking. Fraport commissioned Skytrax to audit its airport, which resulted in a gap analysis showing improvements are needed for arrival and departing areas of the airport.

### *Project Organization*

Terminal Management (under Operations) performs the planning for passenger related requirements. We (IT) therefore views Terminal Management as our customer.

## Self-Service Initiatives

Innovative concepts and systems have been introduced in order to guarantee competitive passenger operations at Frankfurt Airport. These are:

- **easyPass:** Pilot project at Frankfurt Airport meant to allow shorter waiting times for passengers at border controls. EU citizens holding the new chip-equipped electronic EU passport (ePass) can put this document onto a scanner that reads the data and compares the passengers' biometric image with a live camera. Thus permitting passengers to pass security checks more quickly.
- **Airport App** – Currently released version 2. At one point, this App maintained a top 10 distribution rating for Germany App Store. The Android-App offers extensive information on the topics travel, parking, shopping and further events at the airport. Features include:
  - Flight arrival information: all current arrivals and departures at Frankfurt Airport
  - Extensive information on gastronomy, shopping opportunities, services and further points of interest at Frankfurt Airport (location, store hours etc.)
  - Important passenger information; airlines, check-in possibilities and departure gates



- Specific information for greeters
- Parking: information on fees, parking possibilities and parking planner
- Memory list: all points of interest and flights can be put in memory as favorites (preferred restaurants and shopping possibilities, “my flight”, “where did I park?” and several more).
- Map function: the locations of all points of interest are shown on the map; In addition, a location setup of the map is possible. This is not geo referenced.
- Near me: which points of interest and facilities are in my close vicinity?
- **MAM (Mobile Asset Management)**, allows electronic documentation of the situation in passenger areas by means of transponder technology
- **MACS (Multi Access Control System)**, a powerful and advanced management and access control system
- **Passenger Self Tagging:** Lufthansa only at this time
- **eGates:** A fast, safe and comfortable service that allows passengers to pass the boarding pass control by simply scanning the 2D barcode on their boarding pass
- **Customer-oriented passenger service**, e. g. as part of the service program "**Great to have you here!**". Deployment of electric shuttle cars as well as of "Helping Hands" staff at escalator sites to assist passengers
- **Concepts to improve passenger information** - e.g. flight information via e-mail - info kiosks equipped with barcode scanners that allow passengers to get, for example, up-to-the-minute information on a flight or departure gate - Social media, flight information via Twitter - the FRA app with indoor navigation; makes information on a flight and the airport available at any time
- **Passenger flow analysis** provides forecasts every 5 minutes of the overall passenger flow at Frankfurt Airport. This includes queue lane checking at the security checkpoints, which directs passengers to the best queue lines. Sensors at both ends measure the queues.

## **Data Analysis / Sharing**

Fraport uses an AODB concept for collection and sharing of data through selected stakeholders. Fraport has initiated a “Big Data Strategy”, utilizing a BI platform and virtualized servers. All analytics are performed in memory. Fraport uses the data collected for passenger analysis. Analyzed information is then provided to Terminal Management.

## **IT Architecture**

IT infrastructure is based on the Service Oriented Architecture (SOA). Bus technology is employed at a layered level, where each stakeholder group would maintain their own Enterprise Service Bus (ESB) domains. Fraport then connects the domains for information sharing.



# **ACRP**

## **Project 10-17**

### **Implementing Integrated Self-Service at Airports**

#### **Task 3f:**

#### **Case Study Report #6**

**Port Authority of  
New York / New Jersey  
(PANYNJ)**

TRANSPORTATION RESEARCH BOARD  
NAS-NRC

Submitted by:

**Barich, Inc.**

## INTRODUCTION

This Case Study Report (Report) documents the findings of the case study with the Port Authority of New York / New Jersey (PANYNJ). This Report contains the information collected during the site walks, presentations, and discussions with the PANYNJ delegates. Although detailed analysis of the information collected will be conducted in a separate task, this Report provides preliminary analyses to present relevance to the overall project objective.

The information contained herein is crucial for the development the framework for the Guidebook, especially the final section “Key Highlights/Take-Aways”, which highlight very valuable information and proposes specific areas where information will continue to be assimilated for use with the Guidebook.

## BACKGROUND

### Entities/Location/Attendance

The Case Study was conducted at the PANYNJ offices from 11:00 AM to 12:30 PM on September 18, 2014; the Newark Airport from 2:00 PM to 3:30 PM on September 18, 2014; and the Newark Airport from 9:00 AM to 11:00 AM on September 19, 2014. The Agenda for the Case Study is included as Attachment 1. Research Team Members conducting the Case Study were Justin Phy (Principal Investigator) and Ron Hiscox (Research Specialist). A complete list of the PANYNJ Delegates that participated in the Case Study is included in the Agenda (Attachment 1).

### Case Study Objectives

This case study entails the following objectives:

- Approach to defining the business case of passenger self-services
- Evaluation of community impact issues
- Evaluation of other impacts (facility, business, staff, technology, etc.)
- Key impacts to policies and procedures
- Performance measurement
- Data collection and use
- IT initiatives to support the growing need over the long-term
- Support for Passenger Service Initiatives driven by a tenant or other airport agencies
- Review new Terminal A design for EWR
- Discussion on Management of EWR, TB
- Site tour of EWR, TB



## Research Approach

To meet the objectives, the Team had compiled a series of comprehensive worksheets and preparation documents designed to help facilitate the flow of meetings and collection of information. This documentation was discussed and sent to the case study coordinators prior to the actual on-site visit.

The PANYNJ sponsor, William Radinson, and liaison, Miguel Baltierra, provided extensive support in setting up interview sessions and facilitating meetings and walkthroughs. Once on site, the Research Team engaged with the various PANYNJ delegates during a variety of meetings, which included presentations, discussions, and interviews. In addition, an airport site walk was conducted to experience the self-service efforts first hand.

## KEY HIGHLIGHTS/TAKE-AWAYS

This Case Study achieved very valuable results for the development of the project Guidebook.

### Passenger self-service initiatives implemented by the Port Authority

Passenger Self-Service within the PANYNJ airports is driven by the airlines for the most part, with the Port Authority providing general services throughout the system (EWR, LGA, and JFK) and managing just Terminal B at EWR.

An example of airline based self-service initiatives is that United is preparing to begin do self-boarding. When an initiative is moving forward by a tenant, the tenant must file a Tenant Alteration Application (TAA) with the Port Authority. The Port Authority must approve the initiative from a customer service perspective. The TAA is assessed for wayfinding signage and ADA compliance.

Throughout the PANYNJ, the wayfinding is moving toward digital signs. A color code system (yellow, green, black) was designed in collaboration with Schiphol. It is believed by the Port Authority that too much signage is information overload, so it is simplified for efficiency.

While the Port Authority does not manage all terminals throughout the system, they do have a Welcome Centers presence in each. These are staffed by paid “red coats” and provide all airport information as well as tourism information. The Port Authority has customer care representatives who combine to speak 27 different languages and Welcome Centers are staffed with language speakers relative to flight schedules to maximize the benefit to International passengers. There is a “listen line” and Internet accessibility for specific websites. There are touchscreen kiosks at JFK in 7 different languages, and the Port Authority is working to put them in at EWR.



## **Approach to defining the business case of passenger self-services**

Business cases for passenger self-services begin with the customer satisfaction surveys conducted every year. Programs are developed based on what customers are asking for, which recently have been charging stations and free wifi.

Survey results are coordinated with airline and concession partner and result in system-wide improvements to customer services. United used the data to get corporate support for renovating restrooms, Delta made investments in LGA based on survey results, and destination information helps drive what concessions will be successful.

The next step in the process beyond the surveys is to define pilots for new initiatives. These have been conducted with the TSA, CBP, and other stakeholders for initiatives such as global entry, APC, and mobile boarding passes at TSA. Pilots work well for the Port Authority to evaluate probable success.

## **Evaluation of community impact issues**

The Port Authority evaluates the travel to airports for the community, including travelers and employees. They collaboratively work to improve services from busses, trains, and the Long Island railroad. There is a Council for Airport Opportunity that provides a job coordination program focused on employment opportunities and Government / Community relations, as with the LGA redevelopment project.

## **Evaluation of other impacts (facility, business, staff, technology, etc.)**

Impacts to other areas are evaluated as required. The Port Authority works closely with the airport staffs to determine impacts and make changes based on what is happening in the world. For example, the Planning Standards define requirements for concessions to be 20% pre-security and 80% post-security. The staff provides feedback during the pilots for adjustments.

## **Key impacts to policies and procedures**

Policies and procedures are both centralized and airport directed. There have not been many self-service related impacts to these, other than regulatory issues. Airlines follow the PANYNJ Service Standards and Wayfinding Standards. The Port Authority assesses tenant quality standards and provides support to tenants in improving. The Port Authority has been recognized for ADA proactive compliance. The Port Authority also implemented a customer service training module into the badging process and it resulted in tenants seeking greater levels of training from the Port Authority.



## Performance measurement

Performance for customer service in general is measured in a variety of ways, including:

- Mystery shopping twice a month
- Annual facility assessments
- Annual customer satisfaction survey
- Daily feedback from customers through lost and found portal, website, customer care connection, twitter
  - The Port Authority responds to every comment and tweet (100%)
  - 10 day response period by relevant airport or department
  - Get more compliments than complaints
  - Red coats have card that state that they are customer care and cannot take tips
  - Recognition program for employees

## Data collection and use

Quarterly reporting is conducted on customer feedback, and the results drive what is done in the airports for customer service amenities.

## IT initiatives to support the growing need over the long-term

IT is provided by terminal operators except for Terminal B at EWR. There is not specific long-term IT plan focused on self-service since these initiatives are developed dynamically. Paying for initiatives requires creativity since funding is limited.

## Support for Passenger Service Initiatives driven by a tenant or other airport agencies

There support with the Port Authority for sharing information regarding good initiatives, but it is not formalized. The Aviation Department adopted E-Alerts from another Port Department. Users opt-in for what information they want to know. This was brought to the Aviation Department from a person who transferred in from the other Department.

The Aviation Department is actively building relationships with other Departments and have been able to help standardize the wayfinding in the bus terminal and have them build wayfinding kiosk based on the Aviation Department's design. The Aviation Department's sign standards have been adopted as Port Authority sign standards in general. There is a Customer Service Committee Port-wide.

As a result of self-service implementation by airlines, airline staff is reduced, which creating a lack of staffing to deal with general customer care issues. The Port Authority steps in to



provide support, including helping to manage queue lines and taking care of people during IROPS. To that extent, the Port Authority has gone so far as to bus stranded passengers to the administration building to take showers.

## **Review new Terminal A design for EWR**

The general theme for the new A Terminal at EWR is to only build what you need and maintain flexibility. The design for this terminal includes flexible infrastructure, multiple check-in options (remote, curbside, self, full), flexible hold room spaces, expandable security lanes, a new parking structure, and a connection to the AirTrain.

There are 6 Pods for self-check-in/bag tag, and a discreet area for airlines to process premiere passengers. The design drives toward self-service first and exceptions at the desk. Infrastructure will be installed to accommodate what is needed when the time comes.

For development of this design, airlines were included in monthly meetings. In this terminal, the Port Authority will have some involvement with common use. Intermodal access is planned for Path, NJ Transit, and Amtrak.

## **Discussion on Management of EWR, TB**

The Port Authority manages concourse B2 & B3 in terminal B. There has been a recent renovation that modified check-in counters, pushing them back to give more queue space. In addition, new conference rooms were developed for stakeholders. RFID is used on baggage because of limitations for optical readers on the existing baggage handling system.

The Port Authority hosts monthly meetings with airlines, one for station managers with the Airport General Manager and one as a working group with key stakeholders. Twice a year there are meetings with the home office people from the airlines. There is a monthly ramp safety meeting with ground handlers.

There is a CUTE club that manages the check-in and gates and the Port Authority manages the kiosks, signage, database, and manages gate allocation. The Port Authority supports the CUTE Club issues where needed.

General initiatives include:

- Pilot project - RFID for some carriers
- Touchscreens in AirTrain
- Rail tickets in terminal
- Dynamic Signage is made up from different providers but is being integrated

## Site tour of EWR, TB

Gained an understanding of:

- An understanding of the passenger and baggage flow through the airport (from airport arrival through boarding of aircraft)
- The vision of PANYNJ - Specific “touchpoint areas” that PANYNJ has installed self-services (kiosks, interactive signage, mobile scanning, etc.)
- IT infrastructure used to support the services (wireless, network and data capacities, etc.)
- Integration opportunities with the Passenger Self-Services
- Airline services that perform similar or integrated services for the passenger
- General review of the airport

## **ATTACHMENT 1**

### **Case Study Agenda**

#### **Day 1, Thursday September 18**

##### **Meeting with Central Office Staff, PAS; 1100-1230**

Participants:

- Maggi Villane – PANYNJ
- Earlyne Alexander – PANYNJ
- Miguel Baltierra – PANYNJ
- Justin Phy – Barich, Inc.
- Ron Hiscox – Airport Process Design

Topics:

- Passenger self-service initiatives implemented by the Port Authority
- Approach to defining the business case of passenger self-services
- Evaluation of community impact issues
- Evaluation of other impacts (facility, business, staff, technology, etc.)
- Key impacts to policies and procedures
- Performance measurement
- Data collection and use
- IT initiatives to support the growing need over the long-term
- Support for Passenger Service Initiatives driven by a tenant or other airport agencies

#### **Day 1, Thursday September 18**

##### **Meeting with PANYNJ Planning and EWR Architect, EWR; 1400-1530**

Participants:

- Rich Layman – PGAL
- Ken Brown – PGAL
- Catherine Cronin – PANYNJ
- Miguel Baltierra – PANYNJ
- Justin Phy – Barich, Inc.
- Ron Hiscox – Airport Process Design

Topics:

- Review new Terminal A design for EWR



## **Day 2, Friday September 19**

### **Site Tour of EWR Terminal B, EWR; 0900-1200**

Participants:

- Frank Radics – PANYNJ
- Justin Phy – Barich, Inc.
- Ron Hiscox – Airport Process Design

Topics:

- Discussion on Management of EWR, TB
- Site tour of EWR, TB