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Appendix A: Research Documentation for ACRP Report 41

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APPENDIX A

RESEARCH DOCUMENTATION

A. CASE STUDIES—AIRLINE-DRIVEN

This category includes discussions and analyses of six case studies covering airline-driven self-tagging implementations efforts on three continents, including

a) Air New Zealand at Auckland, Wellington, and Christchurch;
b) Air Canada at Vancouver, Toronto, and Montréal;
c) WestJet at Vancouver and Montréal;
d) Air Lingus at Dublin;
e) EasyJet and Swissport at Geneva; and
f) SAS at Stockholm-Arlanda.

Each case study is introduced with a short synopsis providing the background. For a more in-depth coverage and analysis of each case study, a detailed summary is also provided. Each summary covers the following areas:

- Self-Tagging (what's in place),
- Bag Drop (what's in place),
- Effectiveness of Check-In Prior to Self-Tagging (assessment from a facilities perspective),
- Technical Challenges with Self-Tagging (assessment from a technical perspective),
- Agent Adoption of Self-Tagging (assessment from a people perspective),
- Customer Adoption of Self-Tagging (assessment from a people perspective),
- Next Steps for Self-Tagging (where are you going),
- Airport—Airline Partnering (benefits from an airline perspective—opportunities to compliment the airport-airline partnering), and
- Airport Facility Involvement (brief summary of the positions/status held by each airport where airline self-tagging is deployed).

The relevant information in these areas that are of importance to the project's purpose is summarized in the highlights and applicability/transference analysis sections preceding the detailed summary.

a) Air New Zealand (ANZ) at Auckland (AKL), Wellington (WLG), and Christchurch (CHC)

- *Synopsis:* ANZ sponsored the meetings and tours conducted by the site team at all three airport locations. While in Auckland, the team met with ANZ strategic planning personnel, at the offices of ANZ. The team also conducted airport site tours with ANZ operations staff and met with airport management and operation staff. Also, while in Auckland, the team recorded transaction analyses

of the self-tagging operations. This process was repeated at Christchurch and Wellington Airports.

- o *Highlights:*
  - ▪ *Transaction Analysis:* The team performed approximately 100 transaction analyses, including throughput analyses, success rates, bag drop-off rates, and rework rates. Highlights include

Auckland Airport.

  - - Passengers and ANZ staff are impressed with it in the way it has eliminated the queues.
    - The average time for a passenger to check-in and drop bag is 2 minutes and 15 seconds.
    - The average bag drop time is 2 seconds
  - ▪ *Assessment of Installations:* The team conducted facility tours of the three New Zealand airports. The tours were led by airport and airline operations and facility staff who provided insight to the current and planned operations. Highlights include
    - Initial goal for ANZ at all three installations is to conduct bag weighing, and processing in the back-of-house areas. The lack of space in back-of-house at Christchurch Airport required ANZ to use injection belts that allow for weighing before the bag makes it into the baggage room.
    - With its use of kiosks located in circular pods, ANZ stated they require approximately 1/3 less floor space than the traditional check-in counter configurations.
    - Kiosks installations have performed well, with an average of 5% to 10% of the kiosks out of service at any given time.
    - Mobile counters are used to help out when recheck or irregular operations occur.
  - ▪ *Operational Assessment:* The team conducted facility tours of the three New Zealand airports. The tours were led by airport and airline operations and facility staff who provided insight to the current and planned operations. Highlights include
    - Although greater efficiencies are achieved processing the bag (weight, tag status, etc.) in back-of-house operations, ANZ staff prefers to process the bag before it is placed on the belt, since any bag issues can be addressed and resolved while the passenger is still in front of them.
    - Although not formally planned, over the 1-year time span, ANZ has seen a natural and gradual reduction in airline staff used for the check-in

process. For example, in Auckland, ANZ have gone from a peak of 14 staff, to nine.
- Since the staff prefer to stand behind counters, a change of culture was required. Staff training has changed to a more customer-centric type training. Training time has been reduced from on the average, 5 weeks, to closer to 2 weeks, and much of this is done on the job.
- Although passenger adoption has been very good, ANZ staff are needed continually in and around the kiosk areas. An average of one staff to eight kiosks is used.
▪ *Assessment of Business Case:* The team conducted interview sessions with ANZ staff responsible for strategic development. Highlights include
- In New Zealand, the distance between domestic airports is close enough that vehicle transportation is a competing factor with domestic air travel. ANZ serves approximately 70% of the domestic travel market within New Zealand. As such, a key business driver was to shorten the airport process time to stimulate flight travel. Due to short flight times, the overall flight process was twice the flight time.
- Another key business driver is improved customer satisfaction through providing self-service solutions to their passengers.
- ANZ executives encourage the use of intuition as opposed to a highly analytical process, and a shallow corporate structure allows for quick decisions. Decisions are made by doing what makes sense.
- ANZ has eliminated web check-in. They see that as a redundant and unnecessary step. The airline is focused on kiosk check-in at the airport.
▪ *Roadmap for Further Employments:* The team conducted interview sessions with ANZ staff responsible for strategic development. Highlights include
- "Kingfish" (ANZ's domestic product) has been very successful due to ANZ's market share. ANZ will transition Kingfish to international in about 6 to 12 months and the airports will support that transition.
▪ *Design Recommendations*: With the new terminal facility currently under design at Christchurch Airport, the team conducted interviews with the CHC staff responsible for design requirements. Highlights include
- The back-of-house will have a fully flexible baggage handling system that will take any bag from any counter to any of five makeup belts.
- Bag tags have to be active for integrated baggage belt to work.
- The used of radio frequency identification (RFID) will come after a few big airlines invest.
- The airport is providing the baggage system and network, and it will be responsible for managing the baggage system, probably through a contractor.
- At Auckland, ANZ replaced 18 check-in counters with 24 kiosks in pods, with two lower accessibility kiosks. The airline still maintains three check-in desks for elite travelers and special cases that cannot be handled at the kiosk. ANZ handles about 3,000 bags a day, with little to no wait time for the passenger.

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- Kiosks print an active tag, a baggage system message (BSM) is generated, which is linked to the passenger, who applies the tag and drops the bag on the belt.

o *Transference / Applicability to the United States (U.S.):*
In general, information collected at the New Zealand airports is thought to be applicable for U.S. airport installations, with the following potential exceptions noted:
  - *Regulatory:* Domestic travel within New Zealand is not considered to be a significant target for terrorism. As such, the airports have a security policy that dictates less stringent requirements for domestic travel than international. As a result, some of the solutions employed by ANZ, such as the printing of active bag tags and the processing of the bag completely in back-of-house may cause transference concerns to U.S. installations.
  - *Finance:* ANZ executives encourage the use of intuition as opposed to a highly analytical process, and a shallow corporate structure allows for quick decisions. The financial risk of a wholesale change-out is accepted, if it "makes sense."

o *Detailed Summary:* The airline's self-tagging efforts and experiences are summarized as follows:
  - *Self-Tagging:* When designing the self-tagging solution known as "Kingfish," the design team wanted to encourage the use of kiosks as the primary check-in mechanism and eliminate the potential for queues to build up behind the kiosks or in the bag drop area. The design resulted in an open lobby concept with circular pods of kiosks with no stanchions to guide the formation of organized lines. The design also called for a bag drop area that consists of an openly accessible belt where passengers would lay their bags themselves once tagged. Other design elements include the installation of baggage scales for passengers to weigh their own bags to determine if they meet the weight requirement, and the installation of two kiosks off to the side for accessibility concerns, which have the identical functionality of the primary kiosks, but are physically shorter. With this design, the typical customer service agent was forced to assume a modified job function and assist passengers at the kiosk rather that process them from behind a counter. To eliminate a primary obstacle and encourage the use of the self-tagging process, Air New Zealand removed almost all traditional check-in counters leaving only two counters, one to handle exceptions, such as large groups or passengers with accessibility needs, and one to process Premium Passengers. Auckland was the initial deployment of Kingfish. The equipment was phased in over 3 weeks with an overnight cutover to the new system. This deployment replaced 18 check-in counters with 24 kiosks. Approximately 6 million domestic passengers are processed per year and 3,000 bags are processed each day with no queue time. While the deployment at Wellington is almost identical to Auckland, the bag drop at Christchurch varies due space limitations in the baggage room. Systemwide,

the average domestic passenger processing time is currently 2 minutes and 15 seconds with close to 100% utilization of self-service.

- *Bag Drop:* Air New Zealand has a maximum baggage weight limit of 25 kilograms per bag on domestic flights and 32 kilograms per bag on international flights. Due to the fact that these are maximum limits, each bag must be weighed prior to being loaded on the aircraft. Air New Zealand has chosen to put the burden on the passenger to ensure that each bag is within the limits. In Auckland and Wellington, bags are automatically weighed by an inline scale integrated into the baggage system on the secure side. If a bag is determined to be overweight, it is automatically stamped with a label and diverted for manual inspection. An Air New Zealand employee will remove the bag and weigh it manually. If the bag is overweight, the employee will notify an Air New Zealand agent and place the bag aside where it will be retrieved and returned to the check-in area. The Air New Zealand agent will page the passenger who checked the bag to have them return to the check-in counter to retrieve their bag and resolve the issue. If the passenger does not respond to the page, they will be notified at the gate during boarding. With this strategy, approximately 4% of the bags checked have problems, and it is possible that a passenger may miss their flight due to an overweight bag. It is the philosophy of Air New Zealand to create an efficient system for the 96% of passengers who follow the rules. In Christchurch, the process is different due to a lack of space in baggage room. Injection belts are used that allow an agent to weigh every bag before the bag makes it into the baggage room. With this process, any bag issues can be addressed and resolved while the passenger is still with the agent. The bag drop process in Christchurch is slightly less efficient than in Auckland and Wellington due to a brief encounter with an agent at the bag drop and the potential for slow down when an overweight bag is detected. When the new terminal in Christchurch opens, it is the intent of Air New Zealand to use inline scales in the same way they are currently used in Auckland and Wellington.

- *Effectiveness of Check-In Prior to Self-Tagging:* Air New Zealand originally implemented self-service check-in with self-tagging capabilities for domestic flights. This process did not meet the customer's need for efficient check-in due to the requirement to get into a queue line to check their luggage. As a result, the Air New Zealand strategy team began considering a self-tagging option. The Air New Zealand executives encourage the use of intuition in strategy development as opposed to going through a highly analytical process. In addition, a shallow corporate structure allows for quick decisions to be made. With an objective of shortening the airport check-in process to reduce overall travel time, Air New Zealand implemented a full self-tagging capability from the kiosk with a self-service bag drop.

- *Technical Challenges with Self-Tagging:* A few different technical challenges have surfaced for Air New Zealand throughout the initial stages of the self-tagging initiative. Early in the kiosk development process, there were

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some issues with the middleware integrating with the backend systems. IER[*], the kiosk provider, was flexible with their intellectual property and allowed the Air New Zealand in-house development team to have access to the middleware source code. This enabled Air New Zealand to fix the problems. The logic behind the self-tagging application required rework because the first generation was not completely intuitive. It was observed that the screen flow on the kiosks had to advise the passenger of what was happening next because a slight delay in the printing process would allow the passenger enough time to assume the process had completed and walk away before getting their tag or boarding pass. The development of the bag tag itself required multiple iterations, as the original paper stock that was used for the bag tags did not work well in the kiosks. The in-house airline operational support team provides first line support for the kiosks through a help desk. The operational status of the kiosks can be remotely monitored by IER to assess issues and IER partners with Fujitsu to provide onsite support for higher level issues.

- *Agent Adoption of Self-Tagging:* The transition from traditional counter check-in to full self-service check-in posed challenges for the Air New Zealand agent staff. Historically, the check-in agent was a transactional role and the agents became comfortable behind a counter. With this change, the agents were forced to interact closely with the passenger in a customer service role. This was a difficult transition for many of the agents, and some decided that this new role did not suit them and subsequently left the company. Air New Zealand did not plan to make staff reductions based on the new, more efficient process; however, due to natural attrition, the staff count on the floor has reduced and enabled cost savings to be realized. Staff training has changed to more of a customer-centric type training, and training time has been reduced from an average of 5 weeks to an average of 2 weeks with much of this is done on the job. Team managers now spend time out on the floor mentoring and coaching the staff and force the agents to rotate different positions to keep them from staying in their comfort zone too long.

- *Customer Adoption of Self-Tagging:* Air New Zealand has not received a significant push-back on self-tagging by the traveling public; however, there are still passengers who would rather speak to an agent. Primarily individuals with special needs and Premium Passengers still desire to have an agent check them in and tag their bags. To accommodate these passengers, Air New Zealand maintains just a few check-in counters for just these purposes. In general, the feedback received from the Air New Zealand passengers has been mostly positive.

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[*] The Transportation Research Board, the National Research Council, and the Federal Aviation Administration (sponsor of the Airport Cooperative Research Program) do not endorse products or manufacturers. Trade or manufacturers names appear herein solely because they are considered essential to the clarity and completeness of the project reporting.

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- *Next Steps for Self-Tagging:* Air New Zealand is planning to start trans-Tasman operations with Australian Airports in 2010. This effort will require facility and operational enhancements in all three airports as well as regulatory coordination with agencies in New Zealand and Australia. On June 1, 2010, ANZ went live with its first international self-service for flights to Australia from New Zealand. So far it appears to be successful and meeting the expectations of ANZ customers. In addition, Air New Zealand is a small percentage carrier outside of New Zealand. As such, they are planning to support common use self-tagging development to enable their passengers to self-tag on international flights coming into New Zealand.
- *Airport—Airline Partnering:* For ANZ, the good partnering relationship with each airport has been a key contributor for the success of its installations. At present, ANZ has been allowed to install dedicated systems but is willing to discuss the benefits behind future common use installations. At present, branding is not a key concern to Air New Zealand since it operates out of primarily dedicated space in each of the three major airports in New Zealand.
- *Airport Facility Involvement:*
  - *Auckland Airport—Transition of Kingfish to International.* Auckland Airport has been extremely supportive of Air New Zealand's implementation of Kingfish and will be turning their attention soon to the transition of Kingfish to Air New Zealand international departures. In order to support this effort and the expected desire of other trans-Tasman carriers to implement self-tagging in the future, Auckland anticipates needing to provide a common bag drop.

    The approach that Auckland plans to take in defining the requirements of the new processes will likely be based on the success of a current initiative utilizing Lean Six-Sigma strategies to define alternatives based on a "good, better, best" mentality for the improvement of the MAF (Ministry of Agriculture and Fisheries) processes for screening inbound international baggage.
  - *Wellington Airport—Common Use Self-Service in an Integrated International and Domestic Terminal.* Wellington Airport operates an integrated international and domestic terminal in which Air New Zealand, as well as other airlines, process all check-in and bag drop operations by utilizing the same physical location and baggage system. Counters are currently dedicated to airlines, but the airport owns the entire infrastructure and the licenses (lease agreements) are coming to an end, so the airport is considering how to make more efficient use of the facility through common use. Wellington currently has common use terminal equipment (CUTE) systems in place that operate under a CUTE Club model. However, unlike Auckland and Christchurch, Wellington will not mandate CUTE for international carriers due to the shared use of counters by domestic and international processes. In addition, it is not the intent of Wellington to force common use passenger processing system (CUPPS) compliance on its carriers because it may has the

> potential to hinder the implementation of new innovative technology advancements by the airlines.
>
> - *Christchurch Airport—New Integrated Terminal.* Christchurch is in the process of building a new terminal building that will serve both domestic and international air travel beginning in 2011. This new terminal will provide integrated domestic and international check-in with 56 CUTE-equipped counters. Christchurch has conducted modeling exercises that indicate that Air New Zealand will need to expand beyond their dedicated area during period of overlap between international and domestic departures.
>
>   The new terminal will have a fully flexible, airport-owned baggage handling system that will take any bag from any counter to any one of five makeup belts. The airport will be responsible for managing the baggage system and has been coordinating with Air New Zealand to identify specific needs for integration of their specific baggage handling equipment.
>
>   The life of the new terminal was based on the current usage of the existing terminal; however, by utilizing a fully common use approach, the airport is expecting to achieve greater efficiency that will provide for 4 to 5 years worth of growth. The airport does anticipate having to plan for new construction within the next 4 to 5 years.

b) **Air Canada (AC) at Vancouver International (YVR), Toronto International (YYZ), and Montréal Pierre Elliot Trudeau International Airport (YUL)**

o *Synopsis:*

AC sponsored the meetings and tours conducted by the site team at YVR and YYZ. While at YYZ, the team met with AC information technology (IT) and strategic planning personnel. The team also conducted airport site tours with AC operations staff and met with airport management and operation staff. Also, while in Toronto and Vancouver, the team recorded transaction analyses of the self-tagging operations. At YUL, interviews were conducted with station personnel. Facility tours of AC installations were sponsored by the YUL staff.

Toronto International Airport.

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o *Highlights:*
  - *Transaction Analysis:* The team recorded approximately 50 transaction analyses, including throughput analyses, success rates, bag drop-off rates, and rework rates at Toronto and Vancouver. The team's recorded information was supplemented with information obtained from a 2007 YVR presentation of a self-bag -tag kiosks survey, where 138 observations and 231 passengers were recorded. Highlights included:
    - Passengers "flow" through kiosks, where they proceeded to a bag drop queue.
    - Passengers can check bag weight at the entrance of the bag drop queue.
    - Agents at the bag drop have the ability to perform some of the check-in operations. The passenger should already have checked in at the kiosk.
    - Passengers with oversized baggage and exceptions are directed away from the bag drop counters.
    - Process is dependent on agents helping passengers through kiosks and into the queue.
    - AC has observed that as the passengers have learned the self-service process, the average kiosk process time continues to trend downward.
    - Although kiosk transaction time is trending downward, as AC adds new functionality, resultant new passenger activity tends to temporarily increase transaction times as the new passengers learn the self-service process.

  - *Assessment of Installations:* The team conducted facility tours of the three noted Canadian Airports (detailed YUL information is included under the airport-driven case study section of this Appendix). The tours were led by airport and airline operations and facility staff who provided insight to the current and planned operations. Highlights included:
    - Initial goal for AC at both installations is to encourage passenger self-verification of bag weighing at the kiosk. At Toronto, agents attempt to identify overweight bags prior to the baggage acceptance point. At Vancouver, weighing of the bag is a component of the dedicated bag drop.
    - AC noted that when self-service/self-tagging is working effectively, dwell time during peaks can be reduced substantially (30% to 40%).
    - Odd sized bags have to be carried by passengers to the oversize bag drop, after the bag is validated by the agent.
    - AC continues to work on passenger flow models. At Toronto, kiosks are placed to produce a direct linear flow for the passengers, from the kiosk, to the bag drop queue.
    - Kiosks are being upgraded as need demands and cost effectiveness permits.
  - *Operational Assessment:* The team conducted facility tours of the three Canadian airports. The tours were led by airport and airline operations and facility staff who provided insight to the current and planned operations. Highlights included:

- AC provides agent assistance at the kiosks.
- AC noted that in both locations, the passengers are gradually catching onto self-tagging. From a passenger perspective, it was noted that the AC bag drop at Toronto has more flexibility of operations than the AC bag drop at YUL. As a result, AC has modified its process at YUL to reflect the Toronto process.
- Lobby management is critical for success. Agents must work to ensure bags getting to the bag drop or validation points are prepared accordingly. If not, the efficiencies of the bag drop can be reduced to a full-service type counter.
- From a passenger perspective, AC seeks to provide a consistent look and feel across all of its airport locations.

- *Assessment of Business Case:* The team conducted interview sessions with AC staff responsible for strategic development. Highlights included:
    - A key business driver for AC is improved customer satisfaction by providing self-service solutions to their passengers.
    - Reducing passenger dwell time and reduction of peak congestion is another key business driver for AC.
    - AC executives encourage continued improvements of the passenger flow models. At present, they are in a state of development and are trying new things. AC stated that it is difficult to say exactly how the optimum passenger flow model will turn out.
    - At YYZ, the airport's perspective on business benefits include: reduction in the size of check-in facility and, ultimately, delay in construction of capital projects.
- *Roadmap for Further Employments:* The team conducted interview sessions with AC staff responsible for strategic development. Highlights included:
    - AC is working with all Canadian airports for full self-tagging implementation.
    - Although AC prefers the exclusive use model, they are willing to work with Canadian airport sites that are seeking to use self-tagging in a common use model. The only way AC uses a common use model is when it meets or exceeds the AC exclusive use model. Agent control of bag validation is a key concern for AC when working in a common use airport.
    - AC continues to work with IATA in establishing a consistent approach for passenger self-tagging and to support expansion of self-tagging into U.S. airports.
- *Design Recommendations*: The following design related highlights were collected through on-site interviews:
    - All AC kiosks print inactive tags. AC maintains its own active/inactive software at bag drop and validation points.
    - YYZ controls the level of infrastructure that airlines install. YYZ owns the entire infrastructure and dictates that airlines cannot install their own hardware.

- Try to avoid moving kiosks for cost purposes.
- At YVR, the airport likes to have the process drive the technology as a standard approach. Sometimes they have to change process to accommodate technology. In both cases, the airport requests airlines to define business reason. Support for AC's self-tagging was based on airline's presentation of business cases.
- At YVR, there are about 100 kiosks in the airport and 50 in parking or off-site locations, such as at Skytrain, hotels, convention center, cruise ships, and tourist bureaus. There are no current off-site bag drops. The airport would like to see self-tagging available off-site.
- RFID is a data challenge more than an infrastructure challenge.

o *Transference / Applicability to the U.S.:* In general, information collected at the Canadian airports is thought to be applicable for U.S. airport installations, with the following potential exceptions noted:
   - *Regulatory:* Regulatory information is applicable. However, it is important to note that although the TSA has approved transborder use of self-tagging from the Montréal airport, this process is not necessarily transferrable to transborder flights from U.S. airports.

o *Detailed Summary:* The airline's self-tagging efforts and experiences are summarized as follows:
   - *Self-Tagging:* In general, the AC process is as follows:
      - All passengers go to self-service kiosks. Exceptions are business class customers, who can proceed directly to a full-service counter.
      - Passengers print bag tags at kiosks; the bag tags are inactive.
      - Passengers are monitored by agents for assistance and for bag exception handling.
   - *Bag Drop:*
      - All passengers proceed to bag drop or validation stations.
      - AC agent validates bag and activates bag tag.
      - Agents attempt to direct bag exceptions, such as overweight bags, to a rework station, or exception handling station.
      - AC application allows agent at bag drop to do a complete service without having to redirect.
   - *Effectiveness of Check-In Prior to Self-Tagging:*
      - AC noted that one of the biggest challenges is getting bags weighed before bag drop. AC is investigating means to conduct bag weighing appropriately.
      - AC stated their exclusive use self-tagging process has shown to be very effective.
   - *Technical Challenges with Self-Tagging:*
      - Some challenges with kiosks were noted, including paper stock limits and printer issues as the primary maintenance concerns. Depending on the locations, AC must integrate older kiosks with newer models. Older

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kiosks typically do not have boarding pass scanners and have old passport readers.

- Tagging of bags as heavy is important so to protect bag handlers from inadvertently handling heavy bags accepted by the airline. Multi-colored bag tags would be useful to eliminate overlays, but would require significant investment by the airports.

▪ *Agent Adoption of Self-Tagging:* AC has found retraining and motivational challenges with agent adoption. Getting the agents to engage the customer, rather than waiting for the customer to come to the agent, is the primary reason.

▪ *Customer Adoption of Self-Tagging:* Customer adoption has been good.

▪ *Next Steps for Self-Tagging:*
- AC is working with all Canadian airports for full self-tagging implementation.
- AC continues to work with IATA in establishing a consistent approach for passenger self-tagging and to support expansion of self-tagging into U.S. airports.

▪ *Airport—Airline Partnering:* For AC, the good partnering relationship with each airport has been a key contributor for the success of their installations. At all airport locations, AC has chosen to install dedicated systems, but is willing to discuss the potential use of common use installations. However, AC does not believe an airport authority can mandate its check-in process.

▪ *Airport Facility Involvement:*
- *Vancouver International Airport (YVR).* Like YUL, YVR has considerable experience with the deployment and operation of self-service, including passenger self-tagging processes. The airport maintains a very progressive attitude, when it comes to solving problems and working with its airline partners. In overcoming challenges, airport management likes to have the process drive the solution and the technology used behind the solution. When airlines approach the airport with requests for change, Airport management attempts to sit down with the airline, work out the expectations, and forecast needs before designing the solution. At present, the airport is working along these lines with two of its airline partners: Air Canada and WestJet. Both Airlines have presented plans to change their check-in processes, introducing passenger self-tagging as a key component of the new processes. Self-tagging is working for Air Canada for domestic travel and is ready for implementation on the international side. WestJet has also introduced self-tagging for domestic travel.

    The Airport's infrastructure is prepared for common use and self-tagging, airport-wide. At present, it is well positioned for precleared departures to provide self-tagging for airlines going to the U.S., and is working with Transport Canada and the TSA in implementing the process.

- *Toronto International Airport (YYZ).* YYZ, traditionally known as a "common use" airport, is in the process of evaluating its airport-maintain

processes and systems carefully, with consideration to long-term costs of operations. The airlines have independently developed the processes and systems that they needed, and the airport has supported the deployments in terms of approving facility alterations and changes to passenger flow. The airport has also provided common use self-service (CUSS) kiosks and CUTE at the desks, although certain airlines use their proprietary equipment. The airport maintains a very strong perspective of ensuring the Airlines can meet the needs of the passengers. Essentially, the airport maintains that it must change with the industry and adapt to what the passengers want to do. As such, the airport works closely with Air Canada to get Transport Canada approval for self-tagging. Other airlines, such as KLM, are also pursuing a self-tagging solution.

c) **WestJet (WS) at Vancouver International (YVR) and Montréal Pierre Elliot Trudeau International Airport (YUL)**

o *Synopsis:*
WS sponsored the meetings and tours conducted by the site team at YVR. While at YVR, the team met with WS IT and strategic planning personnel. The team also conducted airport site tours with WS operations staff and met with airport management and operation staff. While at YUL, the team met with staff and management from WS Guest Services Department. Also, while at YVR and YUL, the team recorded transaction analyses of the self-tagging operations.

Aéroports de Montréal.

o *Highlights:*
  ▪ *Transaction Analysis:* The team recorded approximately 20 transaction analyses, including throughput analyses, success rates, bag drop-off rates, and rework rates at YVR. Transaction information included self-service kiosks and bag drop, but did not include self-tagging, which was temporarily turned off due to software changes. The team's recorded information was supplemented by information obtained from a 2009 WS technical report on self-tagging simulation modeling tests. The technical report ran simulations over a 24-hour period. Highlights from the facility observations included:
    - Kiosks are in two areas: along a line in front of check-in queues as well as in a roped-off area, dedicated for self-service.

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- Process is dependent on agents helping passengers through kiosks and into queue.
- Average total processing time, including kiosk and bag drop, was 2 minutes and 30 seconds. Maximum recorded time was 4 minutes and 28 seconds.
- Per the WS technical report, and from a guest service perspective (time in system), the YUL self-tagging pilot offers no improvement from current kiosk check-In (4.0 minutes vs. 3.9 minutes time in system, respectively).
- Per the WS technical report, from an operational perspective, self-tagging results in a decrease in agent utilization.

- *Assessment of Installations:* The team conducted facility tours of YVR and YUL (detailed YUL information is included under the airport-driven case study section of this Appendix). The tours were led by airport and airline operations and facility staff who provided insight to the current and planned operations. Highlights included:
  - WS prefers a scenario in which, self-tagging kiosks are clustered together, separate from the other check-in process. WS is still investigating optimum kiosk layout.
  - WS acknowledges that the self-tagging process will be most efficient once the check-in counter is eliminated, such that all check-in is accomplished at the kiosk. From there, the passenger would proceed directly to the bag drop-off location.

- *Operational Assessment:* The team conducted facility tours of the two Canadian airports. The tours were led by airport and airline operations and facility staff who provided insight to the current and planned operations. Highlights included
  - WS noted that at YVR, they saw a 10% conversion rate of passengers on the first day of introducing self-tagging kiosks, which equated to 450 passengers per day from the beginning.
  - So far, with its early experience in self-tagging, WS has experienced a high turnover rate with airport ambassadors.
  - WS agent-to-kiosk goal is 8:1.
  - WS goal is to use a slow deployment strategy in order to allow natural attrition during the transition of staff.

- *Assessment of Business Case:*
  - WS views self-tagging as a key improvement to customer service, which is their primary business case.

- *Roadmap for Further Employments:*
  - WS plans to continue to relinquish check-in counters and have more self-service kiosks. The goal is to achieve 60% to 70% on self-service.

- *Design Recommendations*:
  - WS is pursuing acquisition of self-activation software that will automatically activate tags when the bag is placed on the bag belt.

- o *Transference / Applicability to the U.S.:* In general, information collected at the Canadian airports is thought to be applicable for U.S. airport installations, with the following potential exceptions noted:
  - *Regulatory:* Regulatory information is applicable. However, it is important to note that although the TSA has approved transborder use of self-tagging from the Canadian airports, this process is not necessarily transferrable to transborder flights from the U.S. airports.

- o *Detailed Summary:* The airline's self-tagging efforts and experiences are summarized as follows:
  - *Self-Tagging:* In general, the WS process is listed below. This assumes an exclusive use model. WS is willing to work under common use models where it makes sense to do so. In these situations, variations to the steps below will be considered.
    - Guests proceed to an area dedicated for self-tagging. Non-self-tagging kiosks are located in an area separated from the self-tagging kiosks.
    - WS ambassadors are always available for passenger assistance. Their job is to train the passenger, not to do the tagging for them.
    - All passengers proceed to a dedicated activation queue line.
  - *Bag Drop:*
    - WS's goal is to provide passenger bag drop and activation of bag tags.
    - Bag drop will be a dedicated position, separate from other check-in functions.
  - *Effectiveness of Check-In Prior to Self-Tagging:*
    - WS already uses an effective model for self-service check-in and views little processing time improvements with self-tagging added to the self-service check-in.
  - *Technical Challenges with Self-Tagging:*
    - So far, signage has been a challenge. Typically, it is inadequate due to location and size. Also, there needs to be a label on the kiosk telling the guest where the tag slot is.
  - *Agent Adoption of Self-Tagging:* AC has found retraining and motivational challenges with agent adoption. Getting the agents to engage the customer, rather than waiting for the customer to come to the agent, is the primary reason.
  - *Customer Adoption of Self-Tagging:* Customer adoption has been good.
    - Self-tagging seems to work well with guests with one or two bags; not with sporting equipment, or groups of four or more.
    - Some guests preferred to opt out of using self-tagging unless the WS ambassador did the whole transaction.
    - In the common use model, it was observed that as high as 35% of the neighboring airline's passengers were asking WS ambassadors for assistance.
  - *Next Steps for Self-Tagging:*
    - WS continues to pursue self-tagging, but not aggressively.

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- *Airport—Airline Partnering:* For WS, the good partnering relationship with each airport has been a key contributor for the success of their installations. In some locations, WS has been allowed to install dedicated systems, but is willing to discuss the benefits behind common use installations.
- *Airport Facility Involvement:*
  - *Vancouver International Airport (YVR).* Like YUL, YVR has considerable experience with the deployment and operation of self-service, including passenger self-tagging processes. The airport maintains a very progressive attitude, when it comes to solving problems and working with its airline partners. In overcoming challenges, airport management likes to have the process drive the solution and the technology used behind the solution. When airlines approach the airport with requests for change, airport management attempts to sit down with the airline, work out the expectations, and forecast needs before designing the solution. At present, the airport is working along these lines with two of its airline partners: Air Canada and WestJet. Both airlines have presented plans to change their check-in processes, introducing passenger self-tagging as a key component of the new processes. Self-tagging is working for Air Canada for domestic travel, and is ready for implementation on the international side. WestJet has also introduced self-tagging for domestic travel.

    The airport's infrastructure is prepared for common use and self-tagging, airport-wide. At present, it is well positioned for pre-cleared departures to provide self-tagging for airlines going to the U.S. and is working with Transport Canada and the TSA in implementing the process. Recently, a pilot was conducted with active/inactive tags that showed it to be too easy for a non-validated bag to get through. Even though the baggage system could sort it for further investigation, Transport Canada was not in favor of this solution. The focus on the Olympics, other renovations, and the economic status has further delayed other tests and the ultimate start of these new initiatives.
  - *Toronto International Airport (YYZ).* YYZ, traditionally known as a "common use" airport, is in the process of evaluating its airport-maintain processes and systems carefully, with consideration to long-term costs of operations. The airlines have independently developed the processes and systems that they needed, and the airport has supported the deployments in terms of approving facility alterations and changes to passenger flow. The airport has also provided CUSS kiosks and CUTE at the desks, although certain airlines use their proprietary equipment. The airport maintains a very strong perspective of ensuring the airlines can meet the needs of the passengers. Essentially, the airport maintains that it must change with the industry and adapt to what the passengers want to do. As such, the airport works closely with Air Canada to get Transport Canada approval for self-tagging. Other airlines, such as KLM, are also pursuing a self-tagging solution.
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d) Aer Lingus (EI) at Dublin (DUB)

o *Synopsis:*
Aer Lingus sponsored meetings and tours conducted by the site team at Dublin Airport. While in Dublin, the team met with the Aer Lingus station manager as well as the project manager for the development of the self-tagging product for the airline. The team also met with the planning department of Dublin Airport, and with representatives from SITA and Jacobs Engineering. These companies were responsible for design and implementation work at the new Terminal 2 (T2) facility.

Dublin Airport.

o *Highlights:*
- *Transaction Analysis:* The team performed transaction throughput analyses on the traditional kiosk, check-in desk installations in the terminals. There was no analysis of self-tagging transactions because Aer Lingus had recently shut down their self-tagging pilot due to funding constraints. The check-in facility used for the self -tagging project was separate from the main floor of the terminal and therefore required a split operation. This incurred costs in duplication of effort especially from a baggage loading viewpoint. Aer Lingus discontinued the project after it had proved the concept of self-tagging in the live environment. Aer Lingus is confident that the self-tagging will be a core business system in T2.
- *Assessment of Installations:* The team conducted facility tours of Terminal 1 at DUB. The tour was lead by the airline operations staff that provided insight to the current and planned operations. Highlights include:
  - The airline was the primary driver of all self-tagging installations. Based on their current pilots, the airline worked with the airport to ensure that the new Terminal 2 included self-tagging as the key feature in the passenger processing facilities.
  - The airline views the process as a two-step application. The passenger must use a set of kiosks that produce their boarding passes and then approach a second set of kiosks that produce their bag tags and interacts with the scale to induct the bag into the baggage system. In T2, Aer Lingus plans to offer the two-step or the one-step option, dependant on the time of day. At peak times, when the baggage resource is at a premium, only passengers who have bar-coded boarding pass may self-tag. At off-peak,

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the application will allow for a combined check-in transaction/self-tagging transaction.
- The kiosks near the baggage induction point are interfaced to the sensors and scales, which are built into the induction point. This allows the system to perform measurements (weight, size, etc.) on the baggage prior to completing the induction of the baggage into the system.
▪ *Operational Assessment:* The team conducted facility tours of Terminal 1 at DUB airport. The tour was lead by the airline operations staff that provided insight to the current and planned operations. Highlights include
- The pilot self-tagging included integration with the bag scale and some sensors at the induction point. The airline integrated existing sensors to create a low-cost "automated" induction point. This allowed the airline to weigh the bag, verify dimensions, and collect any fees for overweight/oversize baggage. Once the kiosk transaction was completed, the induction point activated and sent the bag into the sortation system.
- The airline felt that one key issue for the application of bag tags by the passenger was the bag tag itself. In their initial trials, they found that the passenger generally removed all of the backing from the bag tag, which caused the tag to fail in the induction process, either by ripping off, or causing the tag to attach to the belt system, causing a jam. The airline worked with its bag-tag stock supplier to create a section of backing that was composed of multiple cuts, making it more difficult for the passenger to incorrectly remove all of the backing. They found that this reduced the amount of incorrect bag-tag applications.
- Staff training was required to encourage the current staff to engage the passengers in front of the induction points. Additionally, staff was required to work both sides of the induction point, so there was an elaborate set of catwalks and stairways to enable access to the agent workstation at the induction points.
- The airline envisions 6 to 8 self-tagging locations per staff person in the future.
▪ *Assessment of Business Case:* The team conducted interview sessions with Aer Lingus staff responsible for the implementation of the self-tagging pilot. Highlights include
- The airline staff reworked the kiosk application to speed the process of check-in based on the new bag-tag application. The staff discovered that, depending on the order of questions asked and the resulting answers, they were able to reduce the time to process passengers by 10 to 20 seconds.
- Much of the traffic from Dublin Airport is short-haul trips within the U.K. As such, the airline designed their kiosk configuration to allow passengers without bags to complete their transactions at the first set of kiosks and avoid the induction point altogether.
- The airline views the self-service initiative as providing more passenger satisfaction due to the nature of today's passengers.

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- - The airline intends to use the self-tagging application to reduce the number of agents required to operate a traditional check-in area.
  - *Roadmap for Further Employments:* The airline is working with the airport to ensure that the current pilot implementation is the cornerstone of the new Terminal 2 development project.
  - *Design Recommendations:* The case study did not yield any useful information on this subject.
- o *Transference / Applicability to the U.S.:*
  In general, information collected at the Dublin Airport is thought to be applicable to U.S. airport installations.
  - *Regulatory:* The regulatory agency in Ireland is similar to the regulatory agency in the U.S. and views all air travel as a potential target for terrorism. The airline is producing an inactive tag, but the current system does not require a human to activate the tag into the induction process.
  - *Finance:* The approach used by Aer Lingus was to implement a low-cost solution to automating the bag drop location. Using off-the-shelf components enables the airline to keep their costs down.
  - *Commercial:* The case study did not yield any useful information on this subject.
  - *Employee:* The airline views this process as enabling the reduction of staff at a check-in area.
  - *Technology:* Aer Lingus uses its own developers to create the software and integration updates, which, in its view, reduces costs and gives better control over the final product.
  - *Facility Impact:* The case study did not yield any useful information on this subject.
  - *Customer Acceptance:* The case study did not yield any useful information on this subject.

- o *Detailed Summary:* The airline's self-tagging efforts and experiences are summarized as follows:
  - *Self-Tagging:* when implementing self-tagging for the pilot, the airline wanted to focus on the processing time of the passengers. This resulted in a design that focused on separating passengers without baggage from passengers with baggage early in the check-in process. The design also called for as much automation as possible using existing sensors and scales. This would allow the airline to continue collecting excess/overweight/oversize baggage fees while not affecting the passenger and reducing the staff required to operate the check-in area.
  - *Bag Drop:* The bag drop location is integrated into the self-tagging operation of the kiosk and prevents the passenger from avoiding baggage fees. The kiosk application receives data from various sensors, and once the baggage transaction is completed, the system sends a dry-contact signal to the belt to accept the bag and induct it into the system. The airline was required to put warning labels on the counters to aid the passenger in placing their bag and to prevent injuries to the passenger, and also installed an override button to

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stop the belt should a passenger end up on the belt system. The airline is currently working on implementing some sort of guard system which would prevent the passenger from placing any part of their body on the belt system, to further prevent injury.

- *Effectiveness of Check-In Prior to Self-Tagging:* The case study did not yield any useful information on this subject.
- *Technical Challenges with Self-Tagging:* Most of the technical challenges with this implementation were with respect to the bag tag itself. In order to create a tag that the passenger could apply, the airline went through several iterations of tag development. The airline also worked with its kiosk application to streamline the check-in process and reduce the time taken to complete the overall check-in transaction.
- *Agent Adoption of Self-Tagging:* Since this was a pilot for the airline, agent adoption was not fully vetted. Only a select number of agents were trained on the new process, and this limited the overall adoption rate.
- *Customer Adoption of Self-Tagging:* The airline found that as passengers used the self-tagging application more, they began to like it. There was a lot of effort from the airline to gain customer adoption, and they will continue to work through this issue as they open Terminal 2.
- *Next Steps for Self-Tagging:* Aer Lingus will reintroduce self-tagging in the new Terminal 2 once it is opened. Until then, the pilot project has been put on hold. Depending on the airport and airline status, Terminal 2 may be delayed while the industry recovers from the economic downturn.
- *Airport—Airline Partnering:* The airline worked through the self-tagging initiative as a tenant improvement and limited the amount of airport involvement. The airport became very involved as the Terminal 2 design was completed, and the airline worked closely with the airport to ensure that the new terminal check-in lobby was designed to accommodate self-tagging.
- *Airport Facility Involvement:* The case study did not yield any useful information on this subject.

e) EasyJet (EZY) and Swissport at Geneva (GVA)

o *Synopsis:* Geneva airport sponsored meetings and tours conducted by the site team at Geneva Airport. While in Geneva, the team met with representatives from Swissport as well as the operations manager for Geneva Airport.

Geneva Airport

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- o *Highlights:*
  - ▪ *Transaction Analysis:* The team performed transaction throughput analyses on the self-tagging kiosks installed by the airport as well as the self-tagging kiosks installed by EasyJet. Swissport handles many of the airlines at the Geneva Airport, and uses its kiosks for its self-tagging applications, while EasyJet uses its proprietary kiosks. The EasyJet observations were made without any feedback from any EasyJet personnel.
  - ▪ *Assessment of Installations:* The team conducted facility tours of the airport. The tour was lead by the Swissport operations staff who provided insight to the current and planned operations. Highlights include:
    - Swiss Airlines and Swissport were once one company, and, prior to separating into two different companies, they began implementing self-tagging.
    - The airline, and now the handling agent, are the drivers of the self-tagging application, but in most cases the airport provides the kiosks and the facilities to support self-tagging.
    - The airport uses a charging model that charges separately for rework counters. This is important because many airlines forgo the rework counter to save expenses, but soon find out that a rework station is required to facilitate smooth operations.
    - The kiosks are located away from the check-in desks to allow passengers space to place their own tags on their baggage prior to entering the bag drop queue.
  - ▪ *Operational Assessment:* The team conducted facility tours of the airport. The tour was lead by the Swissport operations staff that provided insight to the current and planned operations. Highlights include:
    - There are two different self-tagging implementations at Geneva Airport— one provided by the airport, and one that is proprietary to EasyJet. The platform provided by the airport uses CUSS kiosks and prints bag tags for airlines using the kiosks. Both platforms, CUSS and EasyJet proprietary, are located away from the check-in desks. Passengers apply their tags away from the desks, prior to approaching the desks for bag drop.
    - Swissport noted that the uptake of self-tagging was directly related to the amount of agent assistance and direction given at the kiosks. If an agent is standing near the start of the check-in desk queue, or near the kiosks, the passengers are more willing to try using the kiosks for self-tagging.
    - The airport provides the kiosks and the consumables, but the airlines and/or the handling agent are responsible for providing the application using the bag-tag printer in the kiosks. As such, some airlines currently do not provide self-tagging, but are using the CUSS kiosks.
  - ▪ *Assessment of Business Case:* The team conducted interviews with airport and Swissport staff. Highlights include:
    - While the airport provides the kiosks and the bag- tag printers, they are not the driving force behind self-tagging. From the airport's point of view, they will provide the services that their tenants request. In this

case, self-tagging equipment was provided by the airport to support Swiss Airlines, and now Swissport.

- Swissport views self-tagging as a cost-saving operation. Implementation of self-tagging is viewed as allowing the handling agent to reduce required staff to support the passenger activities at the airport.
- Swissport identified the need to train staff to support self-tagging operations. The staff is used to the traditional check-in desk model and requires training to support check-in activities away from the check-in desks.

- *Roadmap for Further Employments:* The airport intends on installing more kiosks throughout the airport and the train terminal collocated with the airport. Self-tagging is not the main driver of this initiative but also will be included in the deployment of these kiosks.
- *Design Recommendations:* The case study did not yield any useful information on this subject.

o *Transference / Applicability to the U.S.:*
In general, information collected at the Geneva Airport is thought to be applicable to U.S. airport installations, except for the following observations:
- *Regulatory:* Tags are currently active when printed, rather than inactive and then activated at the bag drop location. The U.S. regulatory appears to be directed toward printing of inactive tags.

o *Detailed Summary:* The airlines' and ground handlers' self-tagging efforts and experiences are summarized as follows:
- *Self-Tagging:* The main driver for self-tagging for Swissport is to reduce operating expenses for the ground handler. All self-tagging activities are conducted away from the bag drop area and require little to no agent interaction. The ground handler intends to increase the use of self-tagging so that the bag drop process can be reduced to allow more passengers processed.
- *Bag Drop:* Bag drop is a manned position for Swissport and EasyJet. The airlines/ground handlers provide document checks, and ensure that the tag is applied properly and matches. This check is required because a majority of the flights out of Geneva are to destinations outside of Switzerland.
- *Effectiveness of Check-In Prior to Self-Tagging:* Prior to self-tagging, the check-in process followed a traditional model. The number of airlines supported by the airport is such that the total check-in desk space is too limited to add new carriers. Common use, along with self-tagging, allows the airport facilities to support additional carriers in the limited space.
- *Technical Challenges with Self-Tagging:* Supporting inactive tags is a technical challenge due to the nature of the applications created for the CUSS platforms.
- *Agent Adoption of Self-Tagging:* Agent adoption has been slow due to the reluctance to support a process which is viewed as reducing jobs. Additionally, the current staff requires training and support to assist

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customers through the new process. EasyJet has made self-tagging a part of their check-in process, and agent adoption is very high.

- *Customer Adoption of Self-Tagging:* Customer adoption is directly related to the agent adoption of self-tagging. As the agents become more comfortable with the process, they assist the passengers. Through observations, the research team noted that use of self-tagging was limited for the CUSS kiosks. The uptake of self-tagging for EasyJet was very high, as it is a required action for all passengers, using a fee structure for any alternative.
- *Next Steps for Self-Tagging:* Swissport stated that it intended on training their agents to support self-tagging and to make it a key part of their check-in process.
- *Airport—Airline Partnering:* In the case of Swissport, the airline and airport work together to support self-tagging. The airport provides the hardware and consumables, and the airline provides the process and software.
- *Airport Facility Involvement:* The airport is fully involved in supporting the CUSS kiosks and the self-tagging hardware contained in them.

f) SAS at Stockholm-Arlanda (ARN)

o *Synopsis:* The team met with both SAS and the airport. The airline conducted site tours of its installations. While in Stockholm, the team met with SAS corporate self-tagging managers, as well as with the IT director for the airport.

o *Highlights:*

- *Transaction Analysis:* The team performed transaction throughput analyses on the self-tagging kiosks installed by the airline. SAS implemented self-tagging over 18 years ago, and the process is used by all passengers who are checking bags.

Stockholm-Arlanda Airport

- *Assessment of Installations:* The team conducted facility tours of the airport. The tour was lead by the SAS operations staff that provided insight to the current and planned operations. Highlights include
  - SAS was one of the first airlines to implement self-tagging and has a long history with the self-tagging process.
  - Self-tagging is used for both domestic and international travel, but not travel to the U.S. While the overall process is similar, there are some differences in the application and the implementation due to the different market segments.

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- The kiosks are located away from the check-in desks to allow passengers space to place their own tags on their baggage prior to entering the bag drop queue.
- Trash receptacles are strategically located near the kiosks to allow passengers to dispose of the portions of the bag tags which are removed during application.
- Kiosks are located in circular clusters to support a free flow of passengers.
- SAS has several generations of kiosks in use at the airport, all of which support self-tagging.

- *Operational Assessment:* The team conducted facility tours of the airport. The tour was lead by the SAS operations staff that provided insight to the current and planned operations. Highlights include
  - Use of self-tagging in Stockholm was limited to SAS, however, the acceptance and use of self-tagging by the passengers and the agents was very high.
  - The team noted that there were several passengers who appeared to be new to the self-tagging process at Stockholm. It was observed that the agents were very quick to assist the passengers, and the passengers quickly learned how the process worked. One key observation was that the agents guided the passenger through the process, but generally did not perform the process for them. This appeared to aid in the understanding.
  - SAS bag drop was extremely fast. In general, it took about 20 seconds for an agent to check documents, activate the bag tag, and accept the bag into the system.
  - Bag drop was not automated, but was manned by an airline agent.
  - SAS is currently using biometrics as identification for bag drop induction on its domestic flights. This biometric identification is also used at the gate to reconcile the passenger and to ensure that the bag and the passenger are on the aircraft.

- *Assessment of Business Case:* The team conducted interviews with airport and airline staff. Highlights include:
  - The airport is supportive of self-tagging, but does not provide any services for self-tagging, other than network connectivity.
  - SAS has found that self-tagging greatly increases the throughput of the bag drop/check-in desk.
  - SAS uses about one agent to 10 kiosks, reducing the number of staff required to support the check-in operations.

- *Roadmap for Further Employments:* SAS has installed self-tagging at many of its stations, and all kiosks and applications are designed to support self-tagging. In markets where self-tagging is not allowed, such as the U.S., the airline is able to turn off that functionality. Should the particular market allow self-tagging, the airline is able to turn it on very quickly. SAS is also conducting automated bag drop trials, but not currently at Stockholm

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- - *Design Recommendation:* The case study did not yield any useful information on this subject.

- o *Transference / Applicability to the U.S.:*
    In general, information collected at the Stockholm-Arlanda Airport is thought to be applicable to U.S. airport installations, except for the following observation:
    - *Customer Acceptance:* U.S. customers would most likely be reluctant to accept biometric check-in due to privacy concerns.

- o *Detailed Summary:* The airline's self-tagging efforts and experiences are summarized as follows:
    - *Self-Tagging:* The main driver for SAS to implement self-tagging was to increase the efficiency of the bag drop locations. A secondary benefit was to improve customer satisfaction with the check-in process. The airline noted that they did not have a business case for self-tagging, but that they started with trials and have grown the use of the process throughout their system.
    - *Bag Drop:* Bag drop is a quick process for SAS, where the passengers are only dropping their bag and having a document check. The agents are very efficient in this process. SAS is considering automating the bag drop process as well and is currently conducting trials.
    - *Effectiveness of Check-In Prior to Self-Tagging:* SAS has been doing self-tagging for so long that it is difficult to compare the effectiveness of check-in prior to self-tagging.
    - *Technical Challenges with Self-Tagging:* SAS had to work through the process of implementing active/inactive tags. This included changing the baggage reconciliation system, and other systems, to recognize inactive tags and prevent those bags from being loaded into the aircraft.
    - *Agent Adoption of Self-Tagging:* Agents have fully adopted self-tagging.
    - *Customer Adoption of Self-Tagging:* Customers have fully adopted self-tagging. In some instances, because the tag is inactive, the passenger prints an extra tag and places it on their carry-on as baggage identification.
    - *Next Steps for Self-Tagging:* The airline continues to refine its self-tagging process. The next improvement will be to change the bag tag so that it is easier for the passenger to apply.
    - *Airport—Airline Partnering:* The airline is the main driver of self-tagging, and the airport does not provide any direct support.
    - *Airport Facility Involvement:* The airport provides network connectivity to support the airline's applications and systems.

B. CASE STUDIES—AIRPORT-DRIVEN

This category includes discussions and analyses of two case studies covering airport-driven self-tagging implementations efforts, including

a) Montréal (Air Canada, WestJet) and
b) Amsterdam (KLM).

The airport-driven case study discussions follow the same structure and content as the airline-driven case studies

a) Aéroports de Montréal (Air Canada, WestJet)

o *Synopsis:*
Aéroports de Montréal (ADM) management sponsored the meetings and tours conducted by the site team while at the airport. Meetings were held with all primary divisions of ADM, and with operations and corporate staff from the following airlines: Air Canada, Air France, American Airlines, Swiss Air/Lufthansa, U.S. Airways, and WestJet. The team also conducted

Aéroports de Montréal.

airport site tours with ADM operations staff and met with airport management staff. Also, while in Montréal, the team recorded transaction analyses of the self-tagging operations.

o *Highlights:*
  - *Transaction Analysis:* The team performed transaction throughput analyses on the self-tagging kiosks installed by ADM, as well as the self-tagging kiosks installed by Air Canada and WestJet. The team also performed transaction throughput analyses on self-service kiosks and common bag drop locations in the transborder sector.
  - *Assessment of Installations:* The basic layout of the airport includes one terminal and three sectors: domestic, international, and transborder. The domestic and International sectors share a baggage room. The transborder sector is a new passenger processing room with an independent baggage room.
  - *Operational Assessment:* This is a common use airport. ADM had dedicated leases 8 to 9 years ago, but are now 100% common use with the exception of back office space. Some preferential use areas exist with common use equipment. All fees are per passenger charges so there is no extra cost to use the infrastructure.
    Passenger check-in occurs through the web, mobile check-in, and CUSS kiosks (125 throughout airport). There are no dedicated airline kiosks. All airlines with an application are on all check-in kiosks by default. There is

restricted deployment if an airline wants to restrict their presence to certain check-in zones. Also, at present, there is no off-airport check-in, but ADM is in talks to implement off-site check-in. Thirty-two percent of all check-in is through CUSS and 20% is web check-in, 1% mobile. ADM expects web check-in to continue to grow to 30% in the short turn and 40% in 3 to 4 years with 20% mobile check-in. ADM also expects CUSS to increase to 40% in the short term and then drop off from there. ADM is targeting 70% to80% self service check-in.

In the new transborder terminal, 100% of bag tags are inactive until they are dropped at generic non-airline-specific bag drop. In this sector, ADM operates the common bag drop. Portable wireless scanners reconcile and activate tags. ADM's activation process is done within the baggage sortation system. To encourage airlines to trial self-tagging in YUL, ADM is now offering airlines the possibility to print bag tags at kiosks without making any changes to their CUSS application.

- *Assessment of Business Case:* ADM's primary business motivation is to maximize throughput and be more efficient with existing infrastructure. ADM's Business position is to be an airline enabler within the common use model deployed at the airport. ADM wants to enable airlines to try new industry processes. As such, ADM will provide whatever is needed to fill in the gaps in the airlines' systems to facilitate self-tagging.
- *Roadmap for Further Employments:* ADM is working toward expanding the use of the self-tagging process as deployed in the domestic/international zone. In support of this, ADM is actively working with its partnering airlines in the acceptance and adoption of this process.
- *Design Recommendations:* The following general design recommendation were given with regard to self-tagging and working with airlines:
  - Flexibility is key.
  - Airport gives approach to airlines but is open to talking with the airlines about their ideas.
  - Small public airport requires need to maximize space for walking.
  - Dedicated to established industry standards.
  - Use a simulation tool on a small scale.
  - Uses data feeds from systems (kiosk usage) to make decisions.
    - Require a raw data feed from all airport systems.
    - Able to see that certain airlines have passengers trending to arrive 20 minutes before flight, allowing airport to pressure airlines to getting their passengers compliant with arrival times.
  - We have a "CUPPS" working group that includes both "working group" and "steering group" membership. Members include suppliers, airlines, agencies, and airport personnel. This gives the opportunity for discussion and decisions at the corporate level.

- o *Transference / Applicability to the U.S.:*
  - *Regulatory:* Information obtained from this case study is directly applicable to the efforts of this project, and categories listed herein, with this one noted

point of caution: Although the ADM pilots included TSA approval, the TSA has pointed out that this applies only to selected flights into the U.S., and is not necessarily applicable for flights out of the U.S.
- *Finance:* The case study did not yield any useful information on this subject.
- *Commercial:* The case study did not yield any useful information on this subject.
- *Employee:* The case study did not yield any useful information on this subject.
- *Technology:* The case study did not yield any useful information on this subject.
- *Facility Impact:* The case study did not yield any useful information on this subject.
- *Customer Acceptance*: The case study did not yield any useful information on this subject.

- *Detailed Summary:* The airport's self-tagging efforts and experiences are summarized as follows:
  - *Self-Tagging:* ADM has considerable experience with the deployment and operation of self-service kiosks, beginning with boarding pass-only units in preferential airline locations, to common-flow installations including self-tagging for checked baggage. Historically, the airport was managed purely as a facility management organization where airlines managed all dedicated space. However, with the airport facility being physically constrained, ADM management has moved to a full common use model, allowing more efficient use of the limited space.

    As part of this move, passenger self-tagging has been viewed as an important part of improving facility efficiency. Since 2003, ADM has tested and installed various levels of self-service. The various installations represent an evolution of passenger processing, and the growth of self-service within the airport. As the adoption of self-service has increased, ADM has devoted more space and adapted the infrastructure to make kiosk and self-tagging the prime path for passenger processing.

    In 2003, ADM began work on a pilot program for self-tagging. There was a commitment from the airlines and the airport to implement self-service. Considerable work was done to develop processes and systems that would be approved by the regulatory authorities for both Canada and the United States, to enable self-tagging to be built into the airport design at maturity.

    The first step in developing self-tagging was to change the concept of the baggage tag itself, so that the label becomes an uncontrolled document. With current agent tagging, the tag has two important functions from a commercial and security perspective.

    - The tag label with the printed bar code is effectively a physical key that opens the pathway in the baggage handling system (BHS) to sort the bag from the ingestion point to the loading pier.

- The printing of the tag label constitutes the issuance of a contract between the airline and passenger to carry the baggage to the printed destination.

With agent tagging, a staff member determines that the baggage should be accepted for transport, and issues the bag-tag label as proof. In this scenario, all the tags printed are referenced to a specific passenger and bag, and the airline has agreed to carry the bag. The tag label is therefore a controlled and accountable document.

With self-tagging, the printing of the tag label in and of itself does not prove that a particular baggage has been accepted for transport. The tag labels are printed at self-service kiosks and may or may not be used by the passenger. The confirmation and acceptance by the airline is done at the drop-off point, after the tag has been printed elsewhere.

Therefore, the fundamental pilot concept was to reconcile the boarding pass of the passenger with the bag tags at bag drop. This meant that the tag document itself could be considered for the first time as an uncontrolled document, which would enable the printing in public areas and application of the tags by the passenger rather than an airline employee.

The initial trial layout used a physical control of the kiosks and bag tags in a separate area, with an enforced one-way passenger flow. Within the trial zone, the bag tag was printed as well as applied on the bag, and reconciled at the exit. Refer to Figures A-1 and A-2 for representations of the layout.
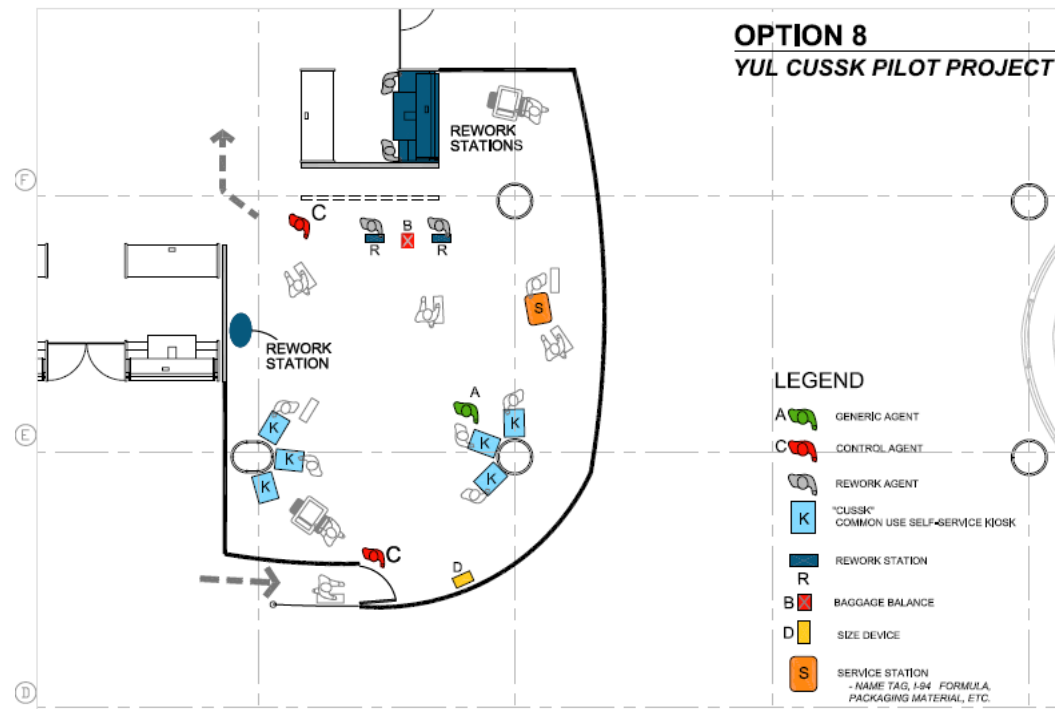

Figure A-1. YUL CUSS pilot project layout.

Figure A-2. YUL physical control schematic.

This trial met several important objectives, including:

- Government approval of self-tagging in a controlled area,
- Development of applications for tag printing and reconciliation, and
- Experience with passenger application of bag tags.

While no quantitative results were provided, the trial was conclusive as evidenced by an obvious increase in throughput and service efficiency. The trial led to the development of improved reconciliation applications, increased airline adoption of self-tagging, and ultimately integration of the process in the permanent airport design:

- Physical control of self-tagging zone;
- Limited airline participation due to nonstandard process; and
- Regulatory approval for trial, not permanent rule change.

■ *Bag Drop:* Since August, 2009, the new transborder check-in area at the airport operates using passenger and baggage processes that support self-service and the new preclearance operation of security screening prior to U.S. Customs and Border Patrol (CBP). The new transborder area is adjacent to the existing terminal building and is made up of separate zones.

■ *Effectiveness of Check-In Prior to Self-Tagging:* Over the years, ADM has used various styles of self-service check-in to help reduce queue lines and congestion experienced at the traditional agent-staffed check-in locations. The following highlight this effort:

- Kiosks supporting agent-staff check-in locations—In 2003, ADM introduced the use of self-service kiosks supporting regular agent check-in. Cost of deployment was relatively low, as it required minimal changes to the desks and equipment, and it did not significantly change passenger flow. The desks are staffed as usual and can be easily used for baggage

> handling and rework. This layout works well at fairly low penetration rates for self-service, since agent check-in is still prime path.
> - Kiosks with separate space adjacent to check-in desks—The growth of self-service for particular airlines required that more space be devoted to kiosks, in place of regular agent check-in. The layout of kiosks in a dedicated space gave a better passenger flow at high rates of usage because self-service passengers were not mixing in the same queue space as agent check-in.
> - Kiosks with dedicated bag drop zone, no self-tagging—As airlines began to rely on self-service as prime path, greater emphasis was placed on the passenger flows for the bag drop-off. The installation of kiosks was designed to support a new bag drop infrastructure, with smaller, less expensive desks and improved space for circulation and queuing. This layout is currently in use for domestic and international passengers. As more airlines adopt self-tagging, the bag drop desks are being adapted to handle the new processes.

- *Technical Challenges with Self-Tagging:* The following technical challenges were noted:
  - Working with the airlines, which tend to want allocated space, creates challenges for common passenger flow at bag drop;
  - Getting kiosk applications to actually print the bag tags. ADM eventually decided upon a middleware solution;
  - Passing bag messaging information to the BHS; and
  - Physical handling and segregation of inactive bags within the BHS.
- *Agent Adoption of Self-Tagging:* It is important to note that the self-tagging layout deployed at the airport is dependent on reliable, consistent high levels of self-service direction by airline agents. When the agents did not engage the customers, process slowdown was quite evident. When the airline business model included a high degree of customer satisfaction and interaction prior to self-tagging, agent adoption was good. When the airline business model accounted for staff who were accustomed to the customer coming to them, the adoption was slower.
- *Customer Adoption of Self-Tagging:* Customer adoption of the process is quite good. Observations during the case studies supported this position. Also, ADM conducted a more formal survey of passenger satisfaction. Five indicators assessed the registration process. More than seven in 10 respondents reported being very satisfied with four of the indicators. Customers seemed to have had several difficulties with baggage labeling, resulting in a less than 70% satisfaction rate. Some of these challenges included printing the tag as well as other problems related to reliability. In addition, the sensitivity of the touch screen also seemed to be lacking. A general percent of satisfaction for the five indicators is shown in Figure A-3.
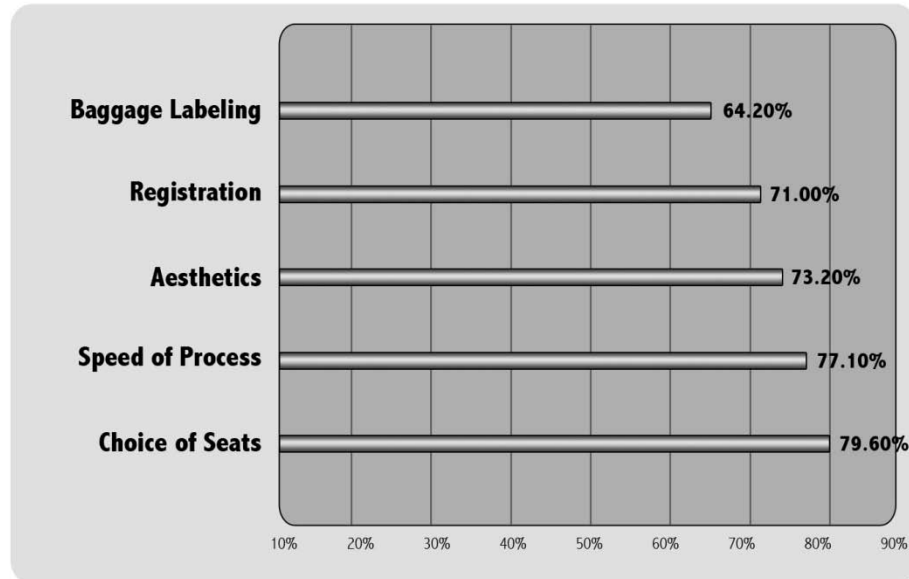
Figure A-3. ADM: Passenger Satisfaction.

- *Next Steps for Self-Tagging:* ADM is working toward expanding the use of the self-tagging process as deployed in the domestic/international zone. In support of this, ADM is actively working with its partnering airlines in the acceptance and adoption of this process. The planned process is as follows:
  - *Check-in:* In ADM's vision, the new terminal flow will consist of: (1) Airlines will check-in/validate; (2) Airport will accept baggage for sortation and tracking. Passengers will access the airline systems as required to complete their check-in transactions and print documents (boarding pass, baggage tag). The systems and equipment include self-service kiosks with bag-tag printers, rework positions, traditional counters, bar-code scanners for web-printed documents and mobile devices. It is anticipated that a large and growing proportion of the passengers will be using the different types of self-service, and the traditional desks will be used by a minority of passengers. Today, more than 50% of ADM's departing passengers are using self-service check-in options.
  - *Rework/Validation:* These positions will be used as required by the airlines for those passengers who require extra work by an airline agent to complete their transactions.
  - *Bag Drop:* ADM's vision is that bag drop is an extension of the baggage sortation system. All passengers with checked baggage will drop their bags at the airport-operated bag drops located after the check-in zone. These bag drops will cater to a common flow, and will be equipped with scanners for both boarding passes and bag tags. The bag drop application will reconcile the bag tags with the appropriate passengers' boarding passes.

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- All bag tags used in the transborder zone are inactive, whether printed by a self-service kiosk or agent workstation. The tags will be activated at the drop-off when the baggage is accepted for transport.
- *Airport—Airline Partnering:* Air Canada and WestJet are active partners with ADM in the passenger self-tagging process. Several other airlines are interested in offering self-tagging in YUL, including US Airways.

b) Amsterdam (KLM)

o *Synopsis:* The team met with KLM, Amsterdam Airport, and BagDrop. The airport conducted facility tours and demonstrated the self-tagging/bag drop system to the team. The team also met with the provider of the automated self-tagging/bag drop system and was given a thorough understanding of how the system works. From the tours and interviews, it was evident that the overall approach to the check-in process was to automate as much as possible.

Amsterdam Airport.

o *Highlights:*
- *Transaction Analysis:* The team performed transaction throughput analyses on the self-tagging/bag drop machines installed by the airport. The airport, in cooperation with KLM, has been conducting trials for the past 2 years to refine the process of automating the check-in process.
- *Assessment of Installations:* The team conducted facility tours of the airport. The tour was led by the airport operations staff, who provided insight to the current and planned operations. Highlights include:
  - Amsterdam Airport is aggressively pursuing the automation of passenger processing. To this end, the solution that is installed at Amsterdam is the most technologically advanced installation in the world today.
  - Amsterdam airport and KLM have two pilot installations of multiple automated baggage induction machines. The pilot locations are manned by KLM agents and are available to a subset of passengers.
  - Passengers are encouraged to use the machines, but not required. The agent offers to direct the passenger to the machines, but the passenger can choose to use traditional bag drop.
  - The baggage induction machines are used frequently by passengers, but the agent checks the passengers' itinerary to determine if they are eligible to use the automated baggage induction machines.

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- - All passengers must first use a kiosk to obtain a boarding pass prior to using either bag drop method.
  - *Operational Assessment:* The team conducted facility tours of the airport. The tour was lead by the airport operations staff that provided insight to the current and planned operations. Highlights include:
    - Use of self-tagging and automated bag drop is limited in the pilot implementation. Airline agents determine the subset of passengers that might be eligible to use the automated machines.
    - The airport provides a video, which is constantly running, to show the operation and process to apply the bag tag and use the induction point. It was noted, however, that passengers did not pay attention to the video, and passengers new to the process required agent assistance.
    - The overall process of checking in and dropping the bag took a consistent amount of time for each passenger.
    - The pilot implementation was fully automated and allowed the passenger to complete the self-tagging, bag drop, and induction by themselves.
    - Every passenger who used the machines spent significant time just watching the operation.
  - *Assessment of Business Case:* The team conducted interviews with airport, airline, and vendor staff. Highlights include:
    - The airport is the main driver of the automated check-in process, and works closely with the airline to test the operations. KLM and the airport have partnered to conduct the pilot testing. The airline worked with the vendor to create a connection to its host system in order to create the bag tag and complete the induction process.
    - The airport identified the bag tag as a critical element of the self-tagging process, and has spent considerable time developing a simplified bag tag. Current generations of the tag have a special adhesive that only sticks to itself, which eliminates the need of the passenger from removing any part of the bag tag prior to application. Future versions of the bag tag will reduce the thickness of the tag, and improve the application of the tag.
    - There are currently six units installed in the pilot locations.
  - *Roadmap for Further Employments:* The airport intends to expand the pilot installations to additional check-in desk locations and would like to expand the installation to include additional airlines. There were no airlines that were currently planning on using the automated induction points.
  - *Design Recommendations:* The current design of the induction points requires a direct connection to the airline host, which affects the ability of the current units to be used by multiple airlines without design changes. The induction points are drastically different from traditional bag drop locations, which require designers to reconsider the check-in area and the design that is implemented.

o *Transference / Applicability to the U.S.:*
    In general, it is not clear if any of the information that was collected would be transferrable to the U.S.

- *Regulatory:* The implementation of self-tagging in Amsterdam is not directly transferrable to the U.S. because U.S. regulators require a human to induct the bag into the baggage system. Additionally, the tag that is implemented in Amsterdam is an active tag, not an inactive tag, which would require additional security to ensure that the active tags could not be removed from the bag tagging area and inducted elsewhere in the baggage system.
- *Finance:* Current costs of the automated machines are significantly higher than other check-in methods.
- *Commercial:* The business case for automated bag drop has not been fully identified for the U.S. market.
- *Technology:* Integrations to airline host systems and requirements for airport infrastructure will need to be clarified and defined for future implementations.
- *Facility Impact:* The case study did not yield any useful information on this subject.
- *Customer Acceptance:* The case study did not yield any useful information on this subject.

- *Detailed Summary:* The airport's self-tagging efforts and experiences are summarized as follows:
  - *Self-Tagging:* Self-tagging is one element of an overall automation of the passenger processing. The airport spent a considerable amount of time studying and developing a bag tag that would be able to be applied with the least amount of effort possible. The result is a bag tag that does not require the removal of any backing and can be applied to almost any baggage. The automated system detects the tag, determines if it is readable, and if it is applied properly. The bag tag is also designed to stick only to itself, which reduces torn bag tags, bag tags sticking to sortation system components, and other tag-related failures due to improper application.
  - *Bag Drop:* The bag drop is fully automated, and the system is designed to ensure that only proper baggage ends up in the sortation system. The system contains numerous sensors that perform different measurements, including weight, size, temperature, motion, and other sensors. The bag drop is also designed to "cage" the baggage prior to sensing so that the passenger cannot tamper with the baggage once the system is conducting its measurements.
  - *Effectiveness of Check-In Prior to Self-Tagging:* The current system is too new to compare the effectiveness of check-in prior to self-tagging. The current system is also in a pilot phase, so the usage is limited and does not facilitate comparison.
  - *Technical Challenges with Self-Tagging:* Interfacing with the airline host systems poses a challenging technical hurdle that limits the current implementation from being expanded. The vendor is currently working on a solution to reduce this technical challenge.
  - *Agent Adoption of Self-Tagging:* Airline agents seem to be adopting the new process fairly well, as the need for agent assistance is still required.

- *Customer Adoption of Self-Tagging:* Customers who used the check-in and bag drop process seemed to appreciate the system and stated that they would use it again. The vendor has a video that contains passenger reactions to using the system.
- *Next Steps for Self-Tagging:* The case study did not yield any useful information on this subject.
- *Airport—Airline Partnering:* The airline and the airport are closely partnered for this pilot process. The airport has provided all equipment and development of the system, while the airline has provided development of host interfaces and staff to support the pilot implementation.
- *Airport Facility Involvement:* The airport is fully responsible for the equipment and is managing the overall pilot process.

C. REGULATORY

This category includes synopses, highlights, and transference analyses of interviews and documents relevant to regulatory issues relating to self-tagging, as gathered from the Transportation Security Administration (TSA) in the U.S., the Civil Aviation Authority (CAA) and the Department for Transport (DfT) in the U.K., and Transport Canada (TC) in Canada.

a) USA (TSA):

i) *Interviewee:* TSA-Federal Security Director (FSD) and Program Analyst

o *Synopsis:* Information shown here is a summary of statements made by TSA representatives regarding passenger self-tagging, as it may relate to future pilot tests conducted at U.S. Airports.

When discussing this verification study as part of ACRP Project 10-07, the TSA was interested in seeing results according to the following objectives:

o *Highlights:*
General Statements
- Identify best practices for implementing self-tagging in the United States, and how they vary between CAT X, CAT I, CAT II, CAT III, and CAT IV airports.
- Consider the impact self-tagging has on the ability for TSA's behavioral detection officers (BDOs) to perform their duties in the airport lobby.
  - Queue line is layer of security and this would be modifying it
  - Getting threat before checkpoint is goal:
    - Looks like customer service, but actually engaging the environment looking for something out of sort.
    - Consider who will be doing the engagement.
    - (Airport Ambassadors wouldn't work).
    - TSA would be an option.
  - If we start filling up lobbies with people it is a security risk.
  - Airport environment is an eco-system:

- When you change the flow of the lobby, the flow at the checkpoint will change.
- Think about how you deal with flow at checkpoint.
- Average wait of 2 minutes, average peak of 6 minutes.
  - Customer Service benefit is obvious:
    - Making them come back through security is significant inconvenience that should be avoided.
  - Partners to consider:
    - Airports, airlines, TSA.
    - Must satisfy TSA - TSA will be hardest stakeholder—Consider how to get them on board by defining what is in it for security.
    - Helps other partners such as Immigration and Customs Enforcement (ICE), if other things are found in the bags.
  - Benefit for small airport:
    - Limited Full Time Employee (FTE), this will help labor costs.
    - Not a big deal for security for small flights.
    - Charters could be bigger issues with large flights.
  - Mostly concerned about unconventional security risks.
  - TSA expects a 15 minute lag for the passenger traffic in the check-in lobby to reach the security checkpoint.
  - Most important things:
    - Make sure there are no gaping holes in security.
    - Being able to identify people and bags.
  - Plan a working group.

Self-Service Baggage Process
- At Cat 4 airports, single kiosk setup with mobile kiosks to pull out for peaks.
- Kiosk at checkpoint for people without bags.

Self-Tagging Process
- What if someone prints too many tags and someone else uses one of them?

Baggage Acceptance Process
  - By doing this, we can't eliminate the engagement:
    - TSA rather have airline representative performing the baggage acceptance process, due to training and thought toward security.
    - Contractor engaging bags to load would not achieve security desire of TSA.
  - PPBM (positive passenger bag match).
  - When firearms are not properly declared, it freezes things.
  - Consider how firearms will be addressed.
  - Recommended solution:
    - At drop point, incorporate hi-res video that can be recalled quickly.
  - Consider how to deal with overflow in a bag drop.

Process Options/Facilitation:
  - Phones on kiosks for passenger to use for rebooking.

Exceptions
- No specific comments made.

Signage
- No specific comments made.

Other Reference Material
- No specific comments made.

o *Transference / Applicability to the U.S.:*
- *Regulatory:* The expressed general agreement with the guidelines contained in the initial release of the IATA Recommended Practice. However, the TSA also expressed concerns with the solutions and processes being implemented and used today for self-tagging outside the U.S. Developing a better understanding of more effective self-tagging implementation processes is a prerequisite for the TSA to initiate any changes to its current policy.

b) United Kingdom (DfT):
i.) *Document:* "Operational Procedures for Self Service Hold Baggage Tagging at Airports where Identification of Hold Baggage is Undertaken by Automated Means," Department for Transport—*Protocol*, May 05, 2009.

o *Synopsis:*
The Department for Transport and members of industry have now completed a period of assessment for Self-Service Hold Baggage Tagging. An acceptable process has now been agreed to for use at any U.K. airport wishing to implement self-service hold baggage tagging. This document describes the detailed protocol for the self-tagging process, from self check-in through bag acceptance. In the event of operating an automated self-service hold baggage tagging system, aircraft operators are "asked" to adopt the protocol defined in this document. The protocol described in this document references National Aviation Security Program (NASP) Section 17, for specific procedures, such as with Hold baggage.

o *Highlights:*
General Statements
- No general statements.

Self Service Baggage Process
- Procedure defines information to be contained in the baggage tag receipt.
- Only one tag should be printed per bag.

Self-tagging Process
- A printed baggage tag must remain inactive until formally activated by the airline representative at the bag drop point.
- Passenger must retain baggage tag receipt for production where necessary prior to and during the flight.

Baggage Acceptance Process

- The passenger is required to take their checked baggage to a designated drop off point.
- An airline representative must control the bag drop facility to ensure passenger bags are not interfered with from the point of acceptance.
- All passengers with checked baggage must be present at the bag drop
- The passenger is identified and the baggage tag, baggage receipt, and boarding pass will be checked.
- Airline representative will check for oversize and overweight baggage that may hinder the operation of the hold baggage screening systems
- The airline agent must ask the security questions relating to the checked baggage.
- Where a tag is produced in error, the passenger should be referred to an airline representative.
  - The operator must ensure that the baggage tag is defaced / destroyed to prevent unauthorized use.
  - The operator must ensure that the tag details are removed from the relevant Departure Control System.
- Operator action required for:
  - If the operator receives unsatisfactory answers, or has any other reason to believe that the passenger cannot properly account for any of his baggage and its contents.
  - If passenger cannot present boarding pass and/or baggage receipt.
  - If operator is not satisfied that the boarding pass and baggage tags have not been previously activated.
- A passenger or unauthorized person must not have access to baggage that has been accepted and the baggage tag activated, unless under supervision by the airline representative.
- Once all the above is confirmed, the baggage tag may only be made active and the baggage accepted and input in the BHS (baggage handling system).
- If unauthorized access occurs, then the airline representative must destroy the kiosk-issued tag(s) and receipt, and delete them from the passenger's record.
- Unused tags will remain inactive, collected and destroyed, and deleted from the system.

Process Options / Facilitation:

- Boarding–Operators shall not cause or permit an aircraft to depart unless it has taken all reasonable steps to ensure that every person who has placed hold baggage in the custody of the operator for carriage in the hold of that aircraft is on board the aircraft.
- Kiosks must be secure (e.g., locked) so that only authorized persons have access to the internals of the kiosk.
- Computer systems and their infrastructure must be protected from unauthorized usage.
- The self-tagging system must be auditable by inspectors.

Exceptions

- Self baggage-tagging operations must cease immediately in the event the Auto Triple A malfunctions or is unavailable for use.

Signage

- No specific comments made.

Other Reference Material

- No specific comments made.

- o *Transference / Applicability to the U.S.:*
  - *Regulatory:* Procedures as noted are generally applicable to U.S. concerns. Specific references to NASP and U.K. Aviation codes may not be directly applicable.

c) Canada (TC):

i. *Interview:*

- o *Synopsis:* Transport Canada (TC) established its passenger self-tagging operating policies from Pilot Trials held at the Montréal Pierre Elliot Trudeau International Airport, during the years of 2003 to 2009. During these trials, considerable work was done to develop processes and systems which would be approved by the regulatory authorities for both Canada and the United States, to enable self-tagging to be built into the airport design at maturity. The information presented here was obtained through presentations, meeting notes, and interviews from those participating in the trials.

  The fundamental concept was to reconcile the boarding pass of the passenger with the bag tags, to enable the identification and segregation of unused tags. This meant that the tag document itself could be considered for the first time as an uncontrolled document, which would enable the printing in public areas and application of the tags by the passenger rather than an airline employee.

  The initial trial layout used a physical control of the kiosks and bag drops in a separate area, with an enforced one-way passenger flow. Within the trial zone, the bag tag was uncontrolled and reconciled at the exit. This trial met several important objectives:
  - Government approval of self-tagging in a controlled area.
  - Development of applications for tag printing and reconciliation.
  - Experience with passenger application of bag tags.

- o *Highlights:*

General Statements

- Coordinated effort between airport, supporting airlines, and regulatory agencies resulted in the following General Operating Requirements for Self-Tagging for the transborder operations between Canada and the U.S. These were approved by the U.S. TSA and TC, and supported by IATA Technical Standards (RP1745).

Self-Service Baggage Process

- The document did not yield any useful information on this subject.

Self-Tagging Process

- ▪ Distinguish between Active and Inactive bags.
- ▪ Track the quantity and identity tags printed by each passenger.

Baggage Acceptance Process
- ▪ Track identity of tags applied by passenger and accepted in the BHS.
- ▪ BHS must automatically identify tags properly applied to accepted bags as Active.
- ▪ Automatically identify unused tags as Inactive.
- ▪ Automatically reject bags with Inactive tags from the BHS.
- ▪ Send a message to each airline host system to indicate which Active tags are associated to each passenger and which tags in the original record are Inactive.
- ▪ Permit a manual change by an authorized agent.

Process Options/Facilitation: Using these general operating requirements, the following describes the agent's role during the trials, as approved by Transport Canada:

Zone entrance agent:
- ▪ Determines passenger eligibility on the following criteria by asking three questions, travel on a participating airline, possession of a valid ticket, possession of a card to access the kiosks.
- ▪ Uses judgment to redirect obvious cases of rework or complexities to the regular check-in. For those passengers applying bag tags, asks the Transport Canada security questions.
- ▪ Permits access to the zone for passengers only, not visitors.
- ▪ Does not permit exit from the zone.
- ▪ Responsible for overall zone supervision, provides direction as required to support agents regarding passenger flow and changes due to individual airline requirements.
- ▪ Acts as prime point of contact for airline agents and others regarding the zone operation.

Kiosk support agent:
- ▪ Provides passenger support as required to use the kiosks.
- ▪ Supervises activity within the zone, particularly regarding use of baggage tags. Provides assistance applying baggage tags, as required.
- ▪ Directs passengers requiring Customs forms, name tags, etc, to the self-service station within the zone.
- ▪ In case of exceptions or rework transactions, directs the passengers to the appropriate airline agent.

Exceptions
- ▪ No specific comments made.

Signage
- ▪ No specific comments made.

Other Reference Material
- ▪ IATA Technical Standards (RP1745).

o *Transference / Applicability to the U.S.:*

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- *Regulatory:* All information obtained is considered to be transferrable, since TSA cooperation was achieved through trials. Actual trial .application as discussed above may not necessarily transfer over to U.S. sites.

ii. *Document:* "Self-Serve Baggage Tagging for Air Travelers Starts July 1, 2009," *Transport Canada*, June 25, 2009.
   o *Synopsis:* This document is a press release announcing that as of July 1, 2009, Transport Canada will permit self-serve baggage tagging at all Canadian airports. According to the press release, this decision was in responding to the needs of passengers and the aviation industry.

   o *Highlights:*
     - *Transaction Analysis:*
       - Helps passengers reduce the time they spend checking in, and
       - Saves passengers time and reduces lineups.
     - *Assessment of Installations:*
       - Frees up valuable space that would otherwise be required for additional check-in counters.
       - Passengers, airlines and airport operators have all responded positively to the convenience of the self-serve option at these airports.
     - *Operational Assessment:*
       - Allows airports and airlines to use their resources more efficiently."
       - Successful trials at Montréal, Toronto, and Vancouver international airports over the past 3 years have shown that self-serve baggage tagging, used in conjunction with new and existing security requirements, is as safe and secure as conventional tagging by airline attendants.
     - *Assessment of Business Case:*
       - Responding to the needs of passengers and the aviation industry.
       - Helps airlines control costs without compromising security.
     - *Roadmap for Further Employments:*
       - Expansion plans include Winnipeg, Edmonton, Ottawa, and Halifax international airports.
     - *Design Recommendations:*
       - The self-serve baggage tagging is designed to maintain high levels of security and oversight.

   o *Transference / Applicability to the U.S.:*
        All information obtained is considered to be transferrable, since TSA cooperation was achieved through trials.

D. INDUSTRY ASSOCIATIONS

This category includes synopses, highlights, and transference analyses of interviews and documents relating to self-tagging as collected from various industry associations, including the American Association of Airport Executives (AAAE), the Airport Consultants Council (ACC), Airports Council International (ACI), the Airport Transport Association (ATA), and the International Air Transport Association (IATA).

a) **AAAE:**
   i) *Interview*
      o *Synopsis:* A meeting was held with a corporate representative of AAAE. While the representative thought there was interest from members, at present, AAAE is not sponsoring ongoing work in the passenger self-tagging areas. Therefore, this interview did not yield any useful information on any of the Highlights or Transference/Applicability subjects.

b) **ACC:**
   i.) *Interviewee:* VP, ACC
      o *Synopsis:* A meeting was held with a corporate representative of ACC. At present, ACC does not have any research or ongoing activities related to passenger self-tagging. Therefore, this interview did not yield any useful information on any of the Highlights or Transference / Applicability subjects.
      o Related to the subject, however, two documents were collected (see entries ii. and iii. below).

   ii.) *Document:* "Airport Information Technology & Systems (IT&S): Best Practices Guidelines for the Airport Industry," *Airport Consultants Council,* July, 2008.
      o *Synopsis:* These guidelines apply to all airports and the key personnel responsible for their proper development, operation, and maintenance. This technical document is intended to serve as best-practice guidelines for the airport industry, with regard to infrastructure of Information Technology and Systems (IT&S). IT&S enables the airport and all of its intricate facets to efficiently and safely function minute-by-minute and day-to-day. The purpose of these guidelines is to provide a comprehensive list of systems that should be planned for in an airport and to describe why each has particular relevance. This list includes an overview and description of each system, how these systems fit into airport operations, and how to integrate them into an overall project.

      o *Highlights:*
         ▪ *Transaction Analysis:* The document did not yield any useful information on this subject.
         ▪ *Assessment of Installations:* The document did not yield any useful information on this subject.

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- *Operational Assessment:* Provides description of all IT-based systems that may be impacted by a passenger self-tagging implementation.
- *Assessment of Business Case:* Section covers discussion of IT governance—provides some guidance on tracking of an airport's IT infrastructure.
- *Roadmap for Further Employments:* The document did not yield any useful information on this subject.
- *Design Recommendations:* The document did not yield any useful information on this subject.

- *Transference / Applicability to the U.S.:*
  - *Regulatory:* The document did not yield any useful information on this subject.
  - *Finance:* The document did not yield any useful information on this subject.
  - *Commercial:* The document did not yield any useful information on this subject.
  - *Employee* The document did not yield any useful information on this subject.
  - *Technology:* Information is applicable for U.S. airports and has some value in providing a self-check assessment of IT systems that may be involved with passenger self-tagging.
  - *Facility Impact:* The document did not yield any useful information on this subject.
  - *Customer Acceptance:* The document did not yield any useful information on this subject.

iii.) *Document:* "Passenger Processing—Extending the Self Service Experience," *Airport Consulting,* Spring 2009.
- Synopsis: Article addresses the evolution of passenger processing from automated passenger check-in and online/cell phone check-in to automated baggage drop. Other issues addressed include automated security checkpoints, automated boarding, and automated arrival.

- *Highlights:*
  - *Transaction Analysis:* The document did not yield any useful information on this subject.
  - *Assessment of Installations:* Self-tagging baggage drops will have the most transformative impact on airport terminals since the advent of the self-service kiosk. Automating the bag drop brings improvement in customer experience, staff reduction, and increased passenger handling capacity at the terminal. It also reduces the security risk inherent at overcrowded terminals.
  - *Operational Assessment:*
    - CUSS kiosks have passed the adoption curve and are found at a growing numbers of airports. IATA reports that 132 airports worldwide are currently offering CUSS kiosks and self-service kiosks

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account for 60 percent or more of today's check-in transactions. Driven by the need to reduce costs, and an increasing reliance on off-airport check-in, airlines are increasingly retiring their own kiosks in favor of CUSS kiosks.

- While passenger check-in has become more automated, the baggage drop function is still largely what it was 50 years ago: wait in line for a uniformed agent to weigh your bag and apply a label to it. Automated baggage drops are beginning to shift this task from the agent to the passenger without substantially increasing the time spent by passengers in the terminal.

- Remote baggage service continues to slowly increase as IT technologies are developed to allow passengers to drop their bag without having to interact with an agent. The use of permanent RFID labels is one of the more attractive technologies being studied for this capability. The cost of RFID bag tags continues to decline to a point where an increasing number of airlines and airports are turning their attention to the technology. Airports outside of the U.S. are increasingly shifting to self-tagging procedures using bag tags issued at the self-serve kiosk. Air New Zealand and Emirates are amongst airlines that have recently deployed innovative airport processes, relying on RFID identification and automated bag drop to do so. Las Vegas remains the prime North American showcase airport in terms of RFID implementation.

- *Assessment of Business Case:* The document did not yield any useful information on this subject.
- *Roadmap for Further Employments:* The document did not yield any useful information on this subject.
- *Design Recommendations:* The document did not yield any useful information on this subject.

o *Transference / Applicability to the U.S.:*
  - *Regulatory:* The document did not yield any useful information on this subject.
  - *Finance:* The document did not yield any useful information on this subject.
  - *Commercial:* The document did not yield any useful information on this subject.
  - *Employee:* The document did not yield any useful information on this subject.
  - *Technology:* Information is applicable to U.S. installations
  - *Facility Impact:* The document did not yield any useful information on this subject.
  - *Customer Acceptance:* The document did not yield any useful information on this subject.

c) ACI:
  i.) *Interviewee:* startup manager - Lufthansa, Director of Planning- Alaska, Director of IT - WestJet
- *Synopsis:* Interview notes from phone meetings with Lufthansa (LH), WestJet, and Alaska Airlines regarding passenger self-tagging and bag drop initiatives. Interviews were conducted as part of the initial effort of the ACI Working Group to understand industry involvement with self-tagging. Information collected was presented at ACI annual meeting.

- *Highlights:*
    - *Transaction Analysis:* The interview did not yield any useful information on this subject.
    - *Assessment of Installations:*
        - LH has used self-service kiosks with a self-tagging functionality in the past. However, the process of self-tagging was so difficult for passengers that we decided to change to the current solution with passenger acceptance/boarding pass issuance at the kiosks and baggage acceptance/baggage tag issuance at dedicated drop off counters. Passengers did not understand that they had to separate the claim portion and keep it. They also did not understand how to affix the tag to the baggage. Self-tagging would only work with sufficient supporting staff for the passengers, or with a very easy baggage tag—which so far has not yet been developed.
        - WestJet—We will be beginning our self-tagging (assisted tagging) trial in YVR within the next couple of weeks.—guest can check in, indicate number of bags, and then print bag tags. Then they will apply the bag tag and then go to the bag drop agent. We call it assisted because we will have agents overseeing it to make sure it is done correctly. This was part of a Regulation concept.
    - *Operational Assessment:*
        - WestJet - We have seen passengers struggling with the Tag. Air Canada has color-coded the bag tag. We are very interested in a more simple baggage tag. IATA is talking. We would eventually like to be able to print from the house.
        - WestJet —active versus inactive—we see some benefits. But what we don't like is having our guest have to queue up to drop the bag. Our Assisted tagging in YVR is not active. They are not allowed to reprint the bag tag from the kiosk. But they could print three and use one. We really don't see the security issue. Overall, we think we don't like it.
    - *Assessment of Business Case:*
        - For Lufthansa, the business driver was to relieve check-in counters and staff, as passenger numbers and therefore also waiting time at the counters were/are increasing. Secondary objectives were that self-service check-in shall be a quick alternative for those who do not need

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any special care (such as passengers with special baggage or reduced mobility, etc.). Self-tagging is only one option to help meet these business drivers.

- For WestJet, the business driver is throughput—how do our guests flow through the airport today… we want to move the people quickly. Other business drivers included choices for their guests and moving operations away from the airport.

- For Alaska / Horizon Air—The primary business driver is the important for Alaska Airlines to differentiate itself from its competitors. Alaska Airlines has used technology in the past to be successful in this area. As Alaska Airlines continually reviews business processes for improvement, they look for areas where technology can play a role in facilitating, or improving, that business process. Alaska Airlines is both an innovator in aviation, and aviation technology. They have continually been among the first to implement new technologies to improve airline efficiency and passenger satisfaction. Another business driver is to improve the check-in process to make it easier for the customer. Again, building on Business Driver 1, the new process provides differentiation for our customers that our competition does not have, which in turn gives us a competitive advantage. One other business driver is to improve efficiencies to increase labor savings.

- ▪ *Roadmap for Further Employments:* The interview did not yield any useful information on this subject.
- ▪ *Design Recommendations:* The interview did not yield any useful information on this subject.

o *Transference / Applicability to the U.S.:*
  All information is generally applicable to U.S. installations and initiatives.

ii.) *Document:* "Self-tagging & Bag Drop Off —Airline Survey-Preliminary Findings," *Presentation, Frank Barich, ACI BIT Working Group*, April 30, 2008.

o *Synopsis:* Presentation given during ACI annual meeting covered the preliminary findings from airline surveys conducted. Presentation focused on results of interviews conducted with Alaska Airlines, Lufthansa, and WestJet. Others were contacted, but, at time of presentation, interviews had not been conducted.

o *Highlights:*
  Highlights are as noted in interviews with these airlines.

o *Transference / Applicability to the U.S.:*
  All information is generally applicable to U.S. installations and initiatives, as per the interviews.

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iii.) *Document:* "Bag WG Survey results—Draft," May 15, 2009.
- *Synopsis:* ACI self-tagging and common bag drop airport survey information. Survey on importance of self-tagging and common bag drop. Survey was responded to by twenty North American airports; three of which were from Canada.

- *Highlights:*
  - *Transaction Analysis:* The survey did not yield any useful information on this subject.
  - *Assessment of Installations:* The survey did not yield any useful information on this subject.
  - *Operational Assessment:* The survey did not yield any useful information on this subject.
  - *Assessment of Business Case:* Survey focused on establishment of airport business cases for self-tagging and common bag drop. The following business cases were noted:
    - Cost savings benefit by maximizing self-service activity for baggage registration and tagging.
    - Maximize passenger control of departure and arrival process.
    - Reduce passenger check-in process time.
    - Provide a customer service improvement to the passenger.
    - Reduce staffing.
    - Improve bag processing from off-site check-in.
    - Reduce or control lost baggage counts.
    - Improve ability of tracking passenger and baggage.
    - Optimize baggage drop off operations.
    - Improve efficiency of airport infrastructure.
  - *Roadmap for Further Employments:* 16 of the 20 respondents stated they were interested in proposing passenger self-tagging. 14 of the 20 respondents stated they were interested in proposing common bag drop. Average time of deployment for each was 1 to 3 years from time of survey (2008). Some viewed a common bag drop solution out as far as 5 years from time of survey.
  - *Design Recommendations:* The survey did not yield any useful information on this subject.

- *Transference / Applicability to the U.S.:* The survey did not yield any useful information in any of the subject areas in this section.

d) ATA:
i.) *Interview:*
- *Synopsis:* A meeting was held with a corporate representative of ATA. At present, ATA supports IATA through active participation on all working group and committees related to self-tagging and bag drop initiatives. Additionally, ATA was willing to help and solicited documentation from

members. None was received. This interview did not yield any useful information on any of the Highlights or Transference / Applicability subjects.

e) IATA:
   i.) *Document:* "Recommended Practice 1701f—Self Service Baggage Process" *IATA.*
- o *Synopsis:* Recommended Practice (RP) 1701f describes the specification and standards for self-service tagging and fast drop off for passenger-checked baggage. IATA recommends that, when member airlines, handling agents and airports plan to offer self-service baggage processing capability in a dedicated or common use environment, for the purposes of individual airline processes, the specification and standards as described in this RP are applied. Future developments of this RP may include other functions, both business and technical.

- o *Highlights:*
  Self-Service Baggage Process
    - ▪ Baggage Registration Process:
      - How the agent is informed of the number of bags a passenger intends to check-in, prior to printing the baggage tags.
    - License plate generation as part of the baggage receipt.
    - Baggage System Message (BSM) should not be released prior to bag-tag printing—to avoid contamination of external systems with tentative data.

  Self-tagging Process—how the airline offers the ability for a passenger to print and apply their bag tags (at the airport or any offsite location).
    - ▪ Bag-tag status should be inactive at time of printing.
    - ▪ BSM sent at time of bag-tag printing with an inactive status.
    - ▪ Bag tag should be compliant with existing IATA resolutions, but should not include any removable ID/claim portions.
    - ▪ Bag-tag stock should be the same for dedicated and CUSS environment.
    - ▪ Bag tag should be designed as simple as possible for the passenger to apply.
    - ▪ Bag-tag stock should be maximized (e.g., fan folded stock).

  Baggage Acceptance Process—how an airline or agent contracted by the airline offers a recognizable acceptance point for the purpose of baggage processing in a dedicated or common use environment.
    - ▪ Passenger must have already checked in via a self-service channel.
    - ▪ Passenger is in possession of a boarding token that can be matched to the BSM.
    - ▪ For self-tagging, the passenger has printed and applied the bag tags.
    - ▪ Passenger presents boarding token to the agent—token and bag tags are read to reconcile the bags with the passenger.
    - ▪ If reconciliation is successful, the bags are inducted into the BHS.
      - Induction points should be the same as the bag drop point
      - BSM is updated to show an active status.

- Baggage process message (BPM) should be sent to the airline system to confirm induction.
  - Should a separate /new receipt be required, it should be generated at the fast bag drop position.
  - Bag drop process should provide the capability to verify baggage allowances (e.g., excess baggage) according to individual airline policies.
  - Fee calculations, oversize and out-of-gauge baggage should be performed at another location, outside of self-service process.

Process Options / Facilitation:
  - Should integrate boarding token and bag-tag reading equipment.
  - Should integrate printers (bag tag and boarding pass), travel document scanner.
  - Bag drop position may be automated and/or unassisted.
  - Bag drop position may be operated on a common use basis—individual airline rules and processes should apply at the position.

Exceptions:
  - May be noted due to local regulations:
    - Bag tags printed at bag drop location.
    - Document check at bag drop location.
    - Fee calculations.
  - If induction point is away from bag drop, then at bag drop, airline agent validates and sends validated status to BSM. At induction, the authorized personnel verify bag(s) has been validated, and then updates BSM to active tag status.

Signage:
  - Recommended signage / icons are presented for use by member airlines, airports, or handling agents to advertise the simplified self-service process availability at the airport.

Other Reference Material:
  - Resolution 740 Attachment B.
  - Resolution 792.
  - RP 1745.
  - Resolution 1740a, 1740c.
  - RP 1701d.
  - RP 1797.
  - RP 1800.

o *Transference / Applicability to the U.S.:*
   Information in RP is generally applicable to the U.S. Initial statements by the TSA concur with information contained in the RP. Primary emphasis is on international travel.

ii.) *Document:* "Simplifying the Business (StB) Fast Travel Programme—Pilot Report," *IATA.*

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- *Synopsis:* Information contained in this document is listed as classified and for internal use only. This document was produced by IATA as a methodology document and actual report for tracking the results of pilots conducted through 2008. Pilots tracked by this document have the objective of reviewing and assessing bag registration, self-tagging, and baggage acceptance. This document tracks the results of self-tagging pilots conducted with YUL, YVR, YYZ, and LHR.

- *Highlights:*
  - *Transaction Analysis:* Transaction analysis information was used in general form to help establish industry averages presented in the Tool.
  - *Assessment of Installations:* The document did not yield any useful information on this subject.
  - *Operational Assessment:* The document did not yield any useful information on this subject.
  - *Assessment of Business Case:* Project drivers noted in this document were used in general form for the production of known business drivers.
  - *Roadmap for Further Employments:* The document did not yield any useful information on this subject.
  - *Design Recommendations:* The document did not yield any useful information on this subject.

- *Transference / Applicability to the U.S.:*
  - *Regulatory:* The document did not yield any useful information on this subject.
  - *Finance:* Financial results were used to help set industry averages.
  - *Commercial:* The document did not yield any useful information on this subject.
  - *Employee:* The document did not yield any useful information on this subject.
  - *Technology:* The document did not yield any useful information on this subject.
  - *Facility Impact:* The document did not yield any useful information on this subject.
  - *Customer Acceptance:* Passenger satisfaction information was used in general form for the Tool.

iii.) *Document:* "Fast Travel Campaigns for Airlines and Airports: StB Phase 9 –Final Report," *IATA Presentation,* May 10, 2008.
  - *Synopsis:* Presentation of final report for the IATA Fast Travel Campaigns for Airlines and Airports: StB Phase 9. Comparison of airlines and airports regarding implementation of self-tagging and bag drop.

    Highlights: This document did not yield any useful information on any the subjects for this section.

- o *Transference / Applicability to the U.S.:*
  Information is at high level of the entire program. Although information is applicable, there is not a significant amount to use.

iv.) *Document:* "Fast Travel Update—November 2008." *IATA Presentation*
  - o *Synopsis:* Status review on Fast Travel initiative, plus future development. Presentation provides an update from the start of the program in 2004 to current time in 2008. Presentation showed success in industry penetration of electronic ticketing, CUSS, bar coded boarding passes, and cargo paperless environment. Limited success was shown with RFID for baggage tags.
  - o *Highlights:* This document did not yield any useful information on any the subjects for this section.

  - o *Transference / Applicability to the U.S.:* In general, this document did not yield useful information for this section, except for:
    - ▪ *Customer Acceptance:* Customer acceptance information, such as for automated check-in kiosks was used in a general form in the Tool.

v.) *Document:* "Fast Travel Programme: Cost Benefit Analysis—September 2008." *IATA Presentation*
  - o *Synopsis:* Presentation given by IATA regarding the cost benefit analysis for their fast travel initiatives, including Self-Service Check-In, Bags-Ready-to-Go, Document Scanning, Flight Rebooking, Self Boarding, and Bags Recovery.

  - o *Highlights:*
    - ▪ *Transaction Analysis:* The document did not yield any useful information on this subject.
    - ▪ *Assessment of Installations:* The document did not yield any useful information on this subject.
    - ▪ *Operational Assessment:* The document did not yield any useful information on this subject.
    - ▪ *Assessment of Business Case:*
      - - IATA estimates a baseline cost for desk check-in per passenger of $5.34. Self-service costs provide an average savings per passenger of $3.57. Based on a 2012 goal for 20% penetration, IATA estimates an overall savings to the industry of $1.853 billion.
      - - IATA estimates a baseline cost for traditional agent-controlled bag drop per passenger of $1.95. Self-service costs provide an average savings per passenger of $.55. Based on a 2012 goal for 90% penetration, IATA estimates an overall savings to the industry of $604 million.
      - - IATA estimates that self-service kiosk check-in for a passenger with no bags saves an average of $4.79 compared to traditional desk check-in.
      - - IATA estimates that self-service kiosk check-in for a passenger with bags saves an average of $2.84 compared to traditional desk check-in.

- - Penetration of self-service kiosk usage is estimated to grow an additional 20% by 2012.
  - IATA assumes that an optimized process at bag drop would save half of current transaction time, if the following holds true:
    - Bag drop should be dedicated to that function and use optimized systems to do so
    - Bags presented at bag drop should be "ready to go": tagged with a proper bag tag, good weight, and good number of pieces.
    - Additional savings on kiosk passengers of half, time of bag drop process is reduced by cost of printing tag at a kiosk.
  - Should a bag-tag design be developed for printing at home, IATA estimates that by 2012, 15% of the off web check-in with bags will print their tags at home. For these passengers, we would then save the kiosk transaction, in addition to the above savings.
  - *Roadmap for Further Employments:* The document did not yield any useful information on this subject.
  - *Design Recommendations:*
    - Standards will be required in a number of areas to support bags ready-to-go, including:
      - Design of the bag tag to facilitate self-tagging and home printing.
      - Standards for bag drop applications.
      - Process standard for common use bag drops.
    - Process standard for bag drop acceptance processes—including airline-specific exceptions processes such as excess baggage management.
  - *Transference / Applicability to the U.S.:*
    - *Regulatory:* Design requirements for process definition are directly applicable, for regulatory considerations.
    - *Finance:* The document did not yield any useful information on this subject.
    - *Commercial:* Cost-benefit analysis, directly applicable for U.S. use.
    - *Employee:* The document did not yield any useful information on this subject.
    - *Technology:* The document did not yield any useful information on this subject.
    - *Facility Impact:* The document did not yield any useful information on this subject.
    - *Customer Acceptance:* The document did not yield any useful information on this subject.

- vi.) *Document:* "IATA Common Use Baggage Drop (CUBD) Requirements."
  - *Synopsis:* The document is a listing of requirements and recommendations, with "participant's" comments, for implementation of a common use bag drop solution. This listing was compiled prior to IATA's work on the Recommended Practice.

- o *Highlights:*
    - ▪ *Transaction Analysis:* The document did not yield any useful information on this subject.
    - ▪ *Assessment of Installations:* Provides guidance statements related to facility, staffing, and maintenance requirements.
    - ▪ *Operational Assessment:* Provides guidance statements related to all operational criteria to be considered in conducting a common use bag drop.
    - ▪ *Assessment of Business Case:* The document did not yield any useful information on this subject.
    - ▪ *Roadmap for Further Employments:* Provides guidance statements related to future technologies.
    - ▪ *Design Recommendations:* Provided guidance statements related to physical, technology, and procedural design requirements.

- o *Transference / Applicability to the U.S.:*
    - ▪ *Regulatory:* Information is directly applicable for consideration.
    - ▪ *Finance:* The document did not yield any useful information on this subject.
    - ▪ *Commercial:* The document did not yield any useful information on this subject.
    - ▪ *Employee:* Information is directly applicable for consideration.
    - ▪ *Technology:* Information is directly applicable for consideration.
    - ▪ *Facility Impact:* Information is directly applicable for consideration.
    - ▪ *Customer Acceptance:* Information is directly applicable for consideration.

vii.)   *Document:* "IATA RP1800—Baggage Process Description for Self-Service Check-in (Draft)," *Process Subgroup (PSG)–IATA Baggage Working Group; LH, AF, AC, BAA; Schiphol Airport, SITA, ULTRA Electronics.* November 2006.
- o *Synopsis:* This document is a commented version of Recommended Practice, RP 1800, relating to the sections of RP 1800 that overlaps content covered in RP 1701f for self-tagging.

- o *Highlights:*
    - ▪ *Transaction Analysis:* The document did not yield any useful information on this subject.
    - ▪ *Assessment of Installations:* The document did not yield any useful information on this subject.
    - ▪ *Operational Assessment:* This portion of RP 188 covers "baggage check-in," including self-service kiosk check-in. Within this portion, it discusses process steps for self-service check-in with bag-tag printing, and delivery of baggage at the agent and self-service bag drop-off.
    - ▪ *Assessment of Business Case:* The document did not yield any useful information on this subject.

- *Roadmap for Further Employments:* The document did not yield any useful information on this subject.
- *Design Recommendations:* The document did not yield any useful information on this subject.
  - o *Transference / Applicability to the U.S.:*
    - *Regulatory:* The document did not yield any useful information on this subject.
    - *Finance:* The document did not yield any useful information on this subject.
    - *Commercial:* The document did not yield any useful information on this subject.
    - *Employee:* The document did not yield any useful information on this subject.
    - *Technology:* Guidance and standards information for the operational and technology concerns of this recommended practice are applicable to U.S. installations.
    - *Facility Impact:* The document did not yield any useful information on this subject.
    - *Customer Acceptance:* The document did not yield any useful information on this subject.

viii.) *Document:* "FT BRG Standards Criteria," *IATA*
  - o *Synopsis:* Feedback from Baggage Working Group (BWG) on Fast Travel Bags-Ready-to-Go (BRTG) Standards Criteria. This information was used by the IATA Fast Travel, BRG Working Group, in the preparation of RP 1701f. The document is generally not applicable to this report, since all information was incorporated into RP 1701f. Therefore, this document did not yield any useful information on any of the Highlights or Transference/Applicability subject areas.

E. DOCUMENTS—OTHERS

This category includes highlights and transference analyses of documents gathered by the research team from airports, airlines, solution providers, and industry associations.

a) *Document:* "The Through Airport Passenger Experience: An Assessment of the Passenger Experience and Airport Operations at Heathrow, Gatwick, Stansted and Manchester Airports," *U.K. Civil Aviation Authority*, 2009.
  - o *Synopsis:* In the United Kingdom (U.K.), on November 2007, the Secretary of State commissioned advice from the CAA on improving the through-airport passenger experience. Concern was expressed about particular pinch points where there is potential for passengers to experience delay and frustration and where the responsibility for delivering a good service lies with a combination of bodies. This paper sets out the CAA's advice on improving the interfaces between service providers at U.K.'s four largest airports to increase resilience of the through-airport journey.

- o *Highlights:*
  - ▪ *Transaction Analysis:*
    - - Paper provides general information from passenger surveys and interviews, including:
      - • The survey found that passengers expected the same level of service at the airport regardless of how much they paid for their ticket. Passengers thought that the maximum waiting times at check-in, security and immigration should be less than 20 minutes and a large proportion thought they should be less than 10 minutes (and particularly so for border control).
      - • The CAA survey found that check-in queues across all four airports had a mean waiting time of between 9 and 10 minutes with between 11 and 13 percent of passengers waiting for more than 21 minutes. The check-in process for charter passengers took longer than for other leisure passengers.
      - • The Department for Transport (DfT) passenger survey found that 92 per cent of passengers were either very satisfied or fairly satisfied with their check in experience. Eighty-three percent of these passengers queued for less than 10 minutes at check in with 6 percent queuing for over 30 minutes.
  - ▪ *Assessment of Installations:* The document did not yield any useful information on this subject.
  - ▪ *Operational Assessment:* The document did not yield any useful information on this subject.
  - ▪ *Assessment of Business Case:*
    - - Paper provides general information received from interviews with airlines, as to their business models. The following was noted:
      - • Over recent years, airline business models have become increasingly differentiated with the growth of low cost carriers. The CAA heard from -rills airlines that their objective was to ensure that passengers were processed through the airport as quickly as possible. Their passengers did not want a "Rolls Royce" level of service but preferred to pay less for their ticket in return for a good basic level of service.
      - • Full-service carriers placed a premium on services available to business class passengers and frequently complained of their lack of ability to offer their business class passengers a superior level of service for their journey through the airport when dependent on those services provided by the airport operator and immigration.
      - • Check-in queues are the responsibility of the airlines and their ground handlers. The CAA heard unanimously from the airlines that the potential for passengers to switch carrier when next travelling acted as a powerful incentive on all airlines to ensure that passengers did not suffer routine delays at check-in.
    - - Paper also provides general information related to the airport business modeling:

- The CAA was interested in the length of check-in queues as it heard from airport operators that long queues can significantly impact on passenger satisfaction within the airport, and long queues frequently resulted from the airline opening check-in for a limited period of time which could create an influx of passengers into the central search area (the responsibility of the airport operator).
  - *Roadmap for Further Employments:*
    - Paper provided general statements regarding future employments or direction. Nothing specific to self-tagging, however, the following is noted as key points in general:
      - The passenger experience has been enhanced in recent years by technological solutions from the stage of booking a ticket to check-in and passport control. The adoption of existing technology by a wider range of airlines and the development of new technology will continue to have a positive impact on the passenger experience. IATA has been developing a "Simplifying the Business" project to pilot innovative technology to enhance the journey through the airport.
      - IATA's research has shown that customers value their ability to control their departure and arrival processes. The introduction of self-service kiosks has been well received by passengers and speeds up the check-in process. Further introduction of technology could have a significant impact on speeding up airport processes and providing passengers with greater control over their journey.
  - *Design Recommendations:* The document did not yield any useful information on this subject.

  o *Transference / Applicability to the U.S.:*
    Transference of information is minimal due to the general nature of the paper (i.e., addresses all areas of passenger processing—not just check-in). However, all information shown above is considered applicable for U.S. planning.

b) *Document:* "Domestic Departure: Air Canada Self Baggage Tag Kiosks Survey Results," *Presentation—Vancouver International Airport*, August 2007.
  o *Synopsis:* Survey results for Air Canada survey on self-tagging
    This document is a comparison between passengers that used the conventional way of checking-in (agent does the bag tagging), and passengers using the self baggage-tag kiosks. The survey reported in this presentation was conducted to determine if self baggage-tag (SBT) kiosks are able to reduce passenger processing time.

  o *Highlights:*
    - *Transaction Analysis:* Total of 138 observations and 231 passengers were surveyed. Results provide average times at the kiosks and bag drop for fumble time, total kiosk process time, bag-tag fumble time, bag-tag process time, agent validation time (per passenger), bag drop-off time, and total process time. Survey also provides level of passenger assistance distribution.

- **Assessment of Installations:** The document did not yield any useful information on this subject.
- **Operational Assessment:** Observations of errors or challenges were given, including:
  - Many passengers did not complete the SBT process due to unfamiliarity with the technology, did not understand English, or kiosk malfunction.
  - Kiosks suffered significant downtime due to software errors or baggage-tag jam.
  - Many passengers were turned away from using the kiosks due to the present restrictions.
- **Assessment of Business Case:** The document did not yield any useful information on this subject.
- **Roadmap for Further Employments:** The document did not yield any useful information on this subject.
- **Design Recommendations:** The document did not yield any useful information on this subject.

- *Transference / Applicability to the U.S.:*
  - **Regulatory:** The document did not yield any useful information on this subject.
  - **Finance:** The document did not yield any useful information on this subject.
  - **Commercial:** The document did not yield any useful information on this subject.
  - **Employee:** The document did not yield any useful information on this subject.
  - **Technology:** Observations of kiosk errors is directly applicable.
  - **Facility Impact:** Transaction analysis information is directly applicable to the U.S. and will be used in setting "industry values" for the Report Tool.
  - **Customer Acceptance:** Observation of errors given is directly applicable.

c) *Document:* Press Release—Air France Baggage Tracking, *Air France*, August 17, 2009.
  - *Synopsis:* Air France announces baggage tracking with electronic chips. Air France is testing RFID chips in baggage for real time tracking.

  - *Highlights:*
    - **Transaction Analysis:** 2,000 bags per day are tracked with RFID electronic chips. Every day at Paris-Charles de Gaulle, Air France carries 100,000 bags.
    - **Assessment of Installations:** The document did not yield any useful information on this subject.
    - **Operational Assessment:** RFID chip allows tracking of bag within a few meters and baggage handling performance is monitored and analyzed, thus improving logistics. 80% of missing baggage can be delivered to customers within 24 hours.
    - **Assessment of Business Case:** The document did not yield any useful information on this subject.

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- *Roadmap for Further Employments:* The document did not yield any useful information on this subject.
- *Design Recommendations:* The document did not yield any useful information on this subject.

  o *Transference / Applicability to the U.S.:* The document did not yield any useful information on any subject in this section.

d) *Document:* Email Statistics for American Airlines (AA) at YVR.
  o *Synopsis:* Email provides statistical information for self-service check-in October 1–November 4 for AA in YVR.

  o *Highlights:*
    - *Transaction Analysis:* The document did not yield any useful information on this subject.
    - *Assessment of Installations:* The document did not yield any useful information on this subject.
    - *Operational Assessment:* Survey showed a passenger usage of 4,609 and a 79.2% success rate during that period. During this period, the statistics also showed an agent takeover of 570 (approximately 1%).
    - *Assessment of Business Case:* The document did not yield any useful information on this subject.
    - *Roadmap for Further Employments:* The document did not yield any useful information on this subject.
    - *Design Recommendations:* The document did not yield any useful information on this subject.

  o *Transference / Applicability to the U.S.:*
    - *Regulatory:* The document did not yield any useful information on this subject.
    - *Finance:* The document did not yield any useful information on this subject.
    - *Commercial:* The document did not yield any useful information on this subject.
    - *Employee:* The document did not yield any useful information on this subject.
    - *Technology:* The document did not yield any useful information on this subject.
    - *Facility Impact:* The document did not yield any useful information on this subject.
    - *Customer Acceptance:* Success rates provide industry-average information of use of self-service kiosks.

e) *Document:* "YUL Self-Tagging Modeling Results," *WestJet*, April 15, 2009.
  o *Synopsis:* The specific information in this technical report is held confidential. This technical report evaluates the facility and service levels based on the current pilot project layout of the configuration and the current self-service layout in YUL. Information was modeled under the Rockwell Arena Modeling

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tool for self-service check-in utilizing kiosk, web, and baggage drop process; and for self-tagging check-in utilizing kiosk and self-tagging baggage drop process.

- o *Highlights:*
    - *Transaction Analysis:* Self-tagging pilot offered no appreciable improvement from current kiosk check-in. Report provides transit times used for modeling from airport entrance through queue entrance at baggage drop.
    - *Assessment of Installations:* The document did not yield any useful information on this subject.
    - *Operational Assessment:* Self-tagging pilot show appreciable decrease in agent utilization (30% to 25%).
    - *Assessment of Business Case:* The document did not yield any useful information on this subject.
    - *Roadmap for Further Employments:* The document did not yield any useful information on this subject.
    - *Design Recommendations:* The document did not yield any useful information on this subject.

- o *Transference / Applicability to the U.S.:*
    - *Regulatory:* The document did not yield any useful information on this subject.
    - *Finance:* The document did not yield any useful information on this subject.
    - *Commercial:* The document did not yield any useful information on this subject.
    - *Employee:* The document did not yield any useful information on this subject.
    - *Technology:* The document did not yield any useful information on this subject.
    - *Facility Impact:* Transaction analysis and facility layout information in the report is directly applicable as general information / industry statistics presented in the Decision-Making Tool.
    - *Customer Acceptance:* The document did not yield any useful information on this subject.

- f) *Document:* "Swedish Woman in Airport Muddle," *BBC News,* August 28, 2008.
    - o *Synopsis:* Swedish woman misunderstands instructions and gets on bagbelt. The woman didn't understand the check-in instructions. She traveled just a few meters and was rescued by staff. She wasn't injured and was able to board without any further delay.

    - o *Highlights:* The document did not yield any useful information on any subject in this section.

    - o *Transference / Applicability to the U.S.:* The document did not yield any useful information on any subject in this section, except for:
        - *Technology:* Information related to automation of a process, and the continued requirements to monitor such automation is directly applicable.

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g) *Document:* "Added Value Service Oriented Architecture in an Airport Environment—Amsterdam Airport Schiphol," *Presentation, Jorgo Hoed, Schiphol Group,* Barcelona, November, 2009.
- o *Synopsis:* Presentation covers value of implementing a "service-oriented architecture." Focus is given to automated machines used in self-service bag drop.

- o *Highlights:*
  - *Transaction Analysis:* The document did not yield any useful information on this subject.
  - *Assessment of Installations:* Five machines are operational in Departures 2.
  - *Operational Assessment:* Passenger ID is through bar-coded-boarding-pass- (BCBP-) compliant boarding pass. Systems have airline-specific passenger user-interface.
  - *Assessment of Business Case:* The document did not yield any useful information on this subject.
  - *Roadmap for Further Employments:* The document did not yield any useful information on this subject.
  - *Design Recommendations:* The document did not yield any useful information on this subject.
- o *Transference / Applicability to the U.S.:*
  - *Regulatory:* The document did not yield any useful information on this subject.
  - *Finance:* The document did not yield any useful information on this subject.
  - *Commercial:* The document did not yield any useful information on this subject.
  - *Employee:* The document did not yield any useful information on this subject.
  - *Technology:* Information showing level of automation is applicable to future self-tagging implementations.
  - *Facility Impact:* The document did not yield any useful information on this subject.
  - *Customer Acceptance:* The document did not yield any useful information on this subject.

h) *Document:* "Aéroports de Montréal: Common Baggage Drop Off and Self-Tagging Case Study," *Presentation, Ron Hiscox,* at Airports Council North America, April 30, 2008.
- o *Synopsis:* Aéroports de Montréal Common baggage drop off and self-tagging case study by Ron Hiscox. Baggage-Tag Activation process. General operation requirements for self-tagging.

- o *Highlights:*
  - *Transaction Analysis:* Presentation presents results of self-tagging survey conducted for 1 month in December, 2007.
    - Air Canada: 50,000 common use self-service kiosk (CUSSK) transactions.
    - Air Canada: 67,000 bag-tags printed.

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- 88.9% surveyed said they would use self-tagging kiosk again.
- 67.4% were very satisfied with the process.
- 79.4% were very satisfied with the speed.
- *Assessment of Installations:* Provides information related to self-tagging and baggage activation process implemented at Montréal Airport.
- *Operational Assessment:* The following general operating requirements for self-tagging (Transport Canada, TSA).
  - Distinguish between Active and Inactive bags
  - Track the quantity and identity of tags printed by each passenger.
  - Track the identity of tags applied by the passenger and accepted in the BHS.
  - BHS must automatically identify tags properly applied to accepted bags as active.
  - Automatically identify unused tags as inactive.
  - Automatically reject bags with inactive tags from the BHS.
  - Send a message to each airline host system to indicate which active tags are associated to each passenger and which tags in the original record are inactive.
  - Permit a manual change by an authorized agent.
- *Assessment of Business Case:* The document did not yield any useful information on this subject.
- *Roadmap for Further Employments:*
  - Next airlines projected to join include AA and Swiss.
- *Design Recommendations:* The document did not yield any useful information on this subject.

o *Transference / Applicability to the U.S.:*
- *Regulatory:* Regulatory information related to active/inactive tag status is directly applicable to concerns noted here in the U.S.
- *Finance:* The document did not yield any useful information on this subject.
- *Commercial:* The document did not yield any useful information on this subject.
- *Employee:* The document did not yield any useful information on this subject.
- *Technology:* The document did not yield any useful information on this subject.
- *Facility Impact:* The document did not yield any useful information on this subject.
- *Customer Acceptance:* Passenger survey information is applicable to U.S. installations.

i) *Document:* "Lean Six Sigma Pilot Project—Arrivals," *Beca Applied Technologies Ltd.* June 11, 2009.
   o *Synopsis:* The purpose of the pilot study recorded in this document was to test the viability of the Lean Six Sigma process as a means to develop and institute a multi-agency continuous improvement culture and framework. Study was

performed in the international arrivals area at the Auckland International Airport.

- o *Highlights:*
  - *Transaction Analysis:* Quantitative measurements and analyses were taken throughout the arrivals process.
  - *Assessment of Installations:* The document did not yield any useful information on this subject.
  - *Operational Assessment:* The tests verified the application of Lean Six Sigma process in a multi-stakeholder environment where many parties contribute to the passenger experience. Techniques that worked well included:
    - Voice of the Customer: the main aspects defining the customer experience were determined as waiting time, and environment (e.g., way-finding information, signage, etc.).
    - Define, measure, analyze, improve, and control: the overall methodology to guide the Pilot Study.
    - Standing in a Circle: Identifying waste in the Arrivals process—proved to help understand what happens in the overall process.
    - Kalzena: small changes that can be made immediately on identification of an improvement opportunity.
  - *Assessment of Business Case:* The document did not yield any useful information on this subject.
  - *Roadmap for Further Employments:* The document did not yield any useful information on this subject.
  - *Design Recommendations:* The document did not yield any useful information on this subject.

- o *Transference / Applicability to the U.S.:*
  - *Regulatory:* The document did not yield any useful information on this subject.
  - *Finance:* The document did not yield any useful information on this subject.
  - *Commercial:* The document did not yield any useful information on this subject.
  - *Employee:* The document did not yield any useful information on this subject.
  - *Technology:* The document did not yield any useful information on this subject.
  - *Facility Impact:* The process applied, using Lean Six Sigma, to determine efficiencies and waste in the overall passenger experience could be used in the departures process for check-in, baggage handling, security, and irregular operations.
  - *Customer Acceptance:* The document did not yield any useful information on this subject.

j) *Document:* "Self-Serv™ Kiosks," *ARINC*
  - o *Synopsis:* ARINC brochure on self-service kiosks.

- o *Highlights:* This document did not yield any useful information on any subject in this section.

- o *Transference / Applicability to the U.S.:* This document did not yield any useful information on any subject in this section, except for:
  - *Technology:* Information contained in the brochure is directly applicable to U.S. technology solutions requirements. The document highlights CUSS-compliant check-in applications, with respect to IATA's Fast Travel Initiatives.

k) *Document:* "BagDrop©," *BagDrop systems BV.*
  - o *Synopsis:* PDF Brochure of BagDrop System's Automated Baggage Handling System.

  - o *Highlights:*
    - *Assessment of Installations:* PDF brochure claims the user can increase check-in capacity and improve the passenger experience without large terminal investments? Per the brochure, automated full self service check-in with the BagDrop allows the airport user to increase check-in capacity by up to 80% through faster processing time and a smaller footprint in comparison to conventional check-in. Because passenger check-in no longer depends on staffing of desks, the user can maximize available capacity 24/7 and minimize passenger waiting time, therefore improving the passenger experience and increasing revenue per passenger. BagDrop offers the example of having self-service check-ins at car parks or hotels.

  - o *Transference / Applicability to the U.S.:*
    Information is generally applicable to U.S. operations. This document provides an example of full automation through technology and design.

l) *Document:* "BagDrop©," *Presentation, BagDrop systems BV.*
  - o *Synopsis:* PowerPoint presentation on BagDrop Systems Automated Baggage Handling System.

  - o *Highlights:*
    - Graphical presentation on look and feel of automated system.

  - o *Transference / Applicability to the U.S.:*
    Information is generally applicable to U.S. Operations. This presentation provides an example of full automation through technology and design.

m) *Document:* "Aéroport de Montréal Expands Self Check-in Services First-of-its-Kind Common Use Self-Serve Kiosk (CUSSK) Operation in North America," *Brock Solutions.*

- o *Synopsis:* Project announcement/overview for Brock Solutions: Aéroport de Montréal Expands Self Check-in Services First-of-its-Kind Common Use Self-Serve Kiosk (CUSSK) Operation in North America.

- o *Highlights:*
  - ▪ *Assessment of Installations:* Brock Solutions was contracted to design, develop, and deploy a new Baggage Tag Activation System (BTAS) to enable passenger printing and application of baggage tags and effectively remove the need for dedicated airline manned bag tagging stations and drop-off points.

- o *Transference / Applicability to the U.S.:*
  - ▪ Technology: baggage-tag activation system as described in this announcement is directly applicable to U.S. airport installations.

n) *Document:* "Smart Drop for Passenger Processing—Rapid Passenger Common Bag Drop Solution," *Brock Solutions.*
  - o *Synopsis:* Brochure on Brock Solutions Common Bag Drop solution.

  - o *Highlights:*
    - ▪ *Assessment of Installations:* Per the brochure, the following results have been achieved with the SmartDrop Common Bag Drop solution:
      - Very fast bag drop experience for passengers, in many instances the per-passenger bag drop is less than 5 seconds.
      - High rate of success with passengers applying their own bag tags. In tests with two participating airlines, the passenger success rate was 73% and 80% respectively.
      - Self-service system enables airlines to process a much greater number of passengers without increasing existing labor at check-in.
      - Self-service enables the airport to redesign passenger flows, thereby accommodating a greater number of passengers within the existing facility. This reduces airport improvement fees through the reduction of the need for capital improvement spending.

  - o *Transference / Applicability to the U.S.:*
    - ▪ *Technology:* Baggage-Tag Activation System and SmartDrop system, as described in this announcement, are directly applicable to U.S. airport installations.

o) *Document:* "Increase Airport Capacity with RFID baggage Handling & Self Service Checked Baggage Kiosks: Previous Problems, Future Opportunities," *Presentation, Bartsch International, Airport Show, Dubai 2009.*
  - o *Synopsis:* Presentation given by Bartsch, International regarding the previous problems and future opportunities of RFID technology in the baggage handling and self-service check-in processes.

- o *Highlights:*
  - ▪ *Transaction Analysis:* Provides failure rates and average time estimates for business travelers applying standard bag tag (70% and 40 sec), compared to applying Bartsch's self-service tag (15% and 15 sec).
  - ▪ *Assessment of Installations:* The document did not yield any useful information on this subject.
  - ▪ *Operational Assessment:* Provides statistical information related to self-service use and performance.
  - ▪ *Assessment of Business Case:* For use of RFID tags:
    - RFID in baggage handling reduces the airplanes turn-around time by approximately 7%.
    - Number of lost baggage per passenger goes down (still close to 20 bags lost or misdirected per 1,000 passengers).
  - ▪ *Roadmap for Further Employments:* The document did not yield any useful information on this subject.
  - ▪ *Design Recommendations:* The document did not yield any useful information on this subject.

- o *Transference / Applicability to the U.S.:*
  - ▪ *Regulatory:* The document did not yield any useful information on this subject.
  - ▪ *Finance:* The document did not yield any useful information on this subject.
  - ▪ *Commercial:* Capital cost for RFID baggage handling system is directly applicable to U.S. installations.
    - RFID printers (120 printers per 10 million pax): $240,000.
    - RFID readers (5 readers): $12,500.
    - RFID installation: $25,000.
    - RFID Project Management: $100,000.
    - Trace and Track Tool: $250,000.
  - ▪ *Employee:* The document did not yield any useful information on this subject.
  - ▪ *Technology:* Technology information is directly applicable to U.S. installations.
  - ▪ *Facility Impact:* The document did not yield any useful information on this subject.
  - ▪ *Customer Acceptance:* The document did not yield any useful information on this subject.

p) *Document:* "Treat Your Customers! Self-Service bag Drop," *IER*.
  - o *Synopsis:* IER brochure on self-service bag drop.

  - o *Highlights:*
    - ▪ *Transaction Analysis:* The document did not yield any useful information on this subject.
    - ▪ *Assessment of Installations:* According to brochure, IER system provides simplicity, flexibility, and scalability.

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- *Operational Assessment:* The document did not yield any useful information on this subject.
- *Assessment of Business Case:* The document did not yield any useful information on this subject.
- *Roadmap for Further Employments:* The document did not yield any useful information on this subject.
- *Design Recommendations:* PDF brochure provides design considerations when implementing a self-service bag drop process, including:
  - Is the service open to all passengers or frequent flyers only?
  - What is the number of bags authorized?
  - Is self-tagging included?
  - Is the bag-tag printing at kiosk or at bag drop?
  - Is a bar code or RFID bag tag being used?
  - How is payment for excess baggage collected?
  - *Is document reconciliation required?*

o *Transference / Applicability to the U.S.:*
  - *Technology:* Technology described is directly applicable to U.S. installations.

q) *Document:* "Reliability Saves Time and Money and Enhances Security—Baggage Handling Systems," Siemens.
  o *Synopsis:* Brochure on Siemens Baggage Handling Systems and Engineering Solutions.

  o *Highlights:*
  - *Transaction Analysis:* The document did not yield any useful information on this subject.
  - *Assessment of Installations:* The document did not yield any useful information on this subject.
  - *Operational Assessment:* Brochure provides background information of the process steps including sorting and distributing baggage, transfer baggage, and baggage reclaim.
  - *Assessment of Business Case:* Brochure provides business case reasons for an integrated baggage handling system, including:
    - Standardized modular components make a baggage system easier to operate and maintain, which in turn saves time and money.
    - Today's tight baggage security regulations can be addressed by fitting an additional baggage check (100% Hold Baggage Screening) to an existing installation or by integrating such control stages with a new installation. But there are other factors affecting baggage security, such as the reliability of screening equipment, the ability to track and locate a bag at any time, and the safety of the operating and maintenance personnel.
  - *Roadmap for Further Employments:* The document did not yield any useful information on this subject.

- ▪ *Design Recommendations:* The document did not yield any useful information on this subject.

- o *Transference / Applicability to the U.S.:*
  Information is generally applicable to U.S. installations for baggage handling systems.

r) *Document:* "Baggage Handling Systems," *Vanderlande Industries*
  - o *Synopsis:* PDF brochure of Vanderlande Baggage Handling Systems.

  - o *Highlights:*
    Provides general information about vendor baggage handling system.

  - o *Transference / Applicability to the U.S.:*
    Information is generally applicable to U.S. installations for baggage handling systems.

F. INTERVIEWS—OTHERS

This category includes highlights and transference analyses of additional interviews with airline, airport, and solution providers that did not fit into any of the previous categories.

a) *Interviewee:* IT Manager, Air France (AF)
  - o *Synopsis:* Interview was conducted with AF IT Manager by phone. General statements are as follows. Specific statements are shown below in category breakouts. Air France is currently not engaged in self-tagging, but is undergoing related research. To stay up to date with the progress of self-tagging, AF is participating in the IATA "Bags-Ready-to-Go" working group.

  - o *Highlights:*
    - ▪ *Transaction Analysis:* Surveys were done, but not provided.
    - ▪ *Assessment of Installations:* The interview did not yield any useful information on this subject.
    - ▪ *Operational Assessment:* The interview did not yield any useful information on this subject.
    - ▪ *Assessment of Business Case:* Business case not done, but it is apparent that the cost is high compared to the benefit.
    - ▪ *Roadmap for Further Employments:* AF will continue to monitor the progress.
    - ▪ *Design Recommendations:* The interview did not yield any useful information on this subject.

  - o *Transference / Applicability to the U.S.:* Information from the interview is thought to be generally applicable to U.S. installations.

- *Regulatory:* Security issues with local agency require positive identification of passengers with bag at induction of the bag into the system. Currently, regulatory concerns are impediment to implementing self-tagging in France.
- *Finance:* Can't justify the expense of retrofitting kiosks for printers at this time.
- *Commercial:* Risk involved in heavy bags that might not be tagged as heavy.
- *Employee:* The interview did not yield any useful information on this subject.
- *Technology:* Software doesn't currently print tags at kiosks.
- *Facility Impact:* The interview did not yield any useful information on this subject.
- *Customer Acceptance:* The interview did not yield any useful information on this subject.

b) *Interviewee:* Business Analyst, WestJet
 o *Synopsis:* Interviews were conducted by phone. General statements are as follows. Specific statements are shown below in category breakouts. Self-tagging will play an important role in WestJet's strategy over the next few years and, as a result, the airline would be pleased to participate in this research project. WestJet has passenger self-tagging at Montréal-Trudeau Airport (YUL) and was expected to have it at Vancouver International Airport (YVR) at the end of September 2009 via a phased implementation.

 o *Highlights:*
 - *Transaction Analysis:* The interview did not yield any useful information on this subject.
 - *Assessment of Installations:* At YUL, All kiosks are common use. There are 12 kiosks active at YUL. Kiosks with self-tagging are implemented nearest staffed counter positions so that agent can assist passengers with new process. By the end of 2010, WestJet expects to have self-tagging for all domestic Canadian flights.
 - *Operational Assessment:* Phased implementation works best. WestJet turns on self-tagging functionality in kiosks nearest agent-attended locations first so that agents can assist guests when needed. After the tag is applied to the bag, the guest proceeds to the attended bag drop location. An agent reconciles the boarding pass and the bag tag, and accepts the bag from the passenger.
 - *Assessment of Business Case:* Service enhancement not driven by business case. Benefits of self-tagging include, for example, the management of staff and growth at airports. Guests enjoy the choice and control. Self-tagging is a service that guests like.
 - *Roadmap for Further Employments:* The interview did not yield any useful information on this subject.
 - *Design Recommendations:* Redesign bag tag to be easier for passenger to apply. Good instruction is needed for passengers. Streamline the bag drop and activation process. Innovations would include a streamlined bag drop and activation process. Current process is not very fast.

- o *Transference / Applicability to the U.S.:* Information from the interview is thought to be generally applicable to U.S. installations.
  - *Regulatory:* New regulation allows passenger self-tagging (PST)*.
  - *Finance:* The interview did not yield any useful information on this subject.
  - *Commercial:* The interview did not yield any useful information on this subject.
  - *Employee:* Agents must change traditional role to leave the desk to assist passengers.
  - *Technology:* The interview did not yield any useful information on this subject.
  - *Facility Impact:* The interview did not yield any useful information on this subject.
  - *Customer Acceptance:* Guests like the control and the choices they have with self-service*. One problem with self-tagging is the misapplication of tags, a process that needs to be simplified. There is a need for better designed bag tags and better instructions.

- c) *Interviewee:* Senior Product Director, ARINC
  - o *Synopsis:* ARINC is fully engaged and fully supportive of passenger self-tagging. ARINC is a platform provider and is dependent on an airline's application. ARINC operates in Toronto and Montréal. According to ARINC, IATA does not represent low cost carriers who are the largest growth segment

  - o *Highlights:*
    - *Transaction Analysis:* The interview did not yield any useful information on this subject.
    - *Assessment of Installations:* All ARINC kiosks come with a bag-tag printer or are field upgradable.
    - *Operational Assessment:* The interview did not yield any useful information on this subject.
    - *Assessment of Business Case:* The interview did not yield any useful information on this subject.
    - *Roadmap for Further Employments:* Next phase is print-at-home home and/or RFID tags in luggage. ARINC is in talks with Avery and other label manufacturers regarding passenger tagging at home. The Star alliance just issued a request for proposal (RFP) regarding issuing RFID luggage tags to passengers. American Tourister Luggage is putting RFID in luggage.
    - *Design Recommendations:* They use CUSS and CUPPS technical specifications. ARINC is most active in CUSS self-service kiosks, but the company is watching developments in home printing and RFID initiatives.

  - o *Transference / Applicability to the U.S.:* Information from the interview is thought to be generally applicable to U.S. installations.

d) *Interviewee:* General Manager, IER
  o *Synopsis:* IER manufacturers bag tags and sells to airlines and airports. Self-tagging has been part of IER offering from day one with self-service kiosks. It is always available. Substantial experience due to airlines that IER has been working with using self-tagging. Highest market share for IER is outside of the U.S. The U.S. market share comes from supplying airports as opposed to selling to airlines.

  o *Highlights:*
    ▪ *Transaction Analysis:* The interview did not yield any useful information on this subject.
    ▪ *Assessment of Installations:*
      - There has been a fairly low rate of error with IER kiosks
      - Regarding bag tags, the 21-inch standard is used in common use, but IER believes that could be reduced. The company is working on designs that will make it easier for passenger to apply.
      - Layout depends on how well the terminal lends itself to self-tagging. Self-tagging isn't necessarily the ultimate solution. Self-tagging does not reduce the amount of time a passenger spends in an airport. Passengers may spend more time doing self-tagging due to average time spent at a kiosk.
      - It has been successful where deployed with respect to the ability of the passenger to apply tags and their willingness to participate.
      - Important question when considering self-tagging: How many bag tags are in the kiosk? One roll of paper can print 2,500 boarding passes (coupons). Typical roll of bag tag can print 200. Extensive use kiosks will process 100 passengers per day. Next option is to use fanfold bag tags, which can provide 350.
    ▪ *Operational Assessment:* IER recommends having roaming agents to help passengers during initial days/months.
    ▪ *Assessment of Business Case:* The interview did not yield any useful information on this subject.
    ▪ *Roadmap for Further Employments:*
      - Regional differences: Europe, Canada, and Asia have higher ratio of common use (CU) kiosks.
      - IER expects more self-tagging where there are dedicated airline-owned kiosks.
      - Canada offers self-tagging on CU kiosks because Air Canada pushed for it. It is best to get main airlines onboard if success through CU kiosk is desired.
      - Evolution towards permanent RFID tags will help reduce time spent in airport. Print-at-home tags will be complimentary if can be made compliant with airlines tags.
    ▪ *Design Recommendations:* The interview did not yield any useful information on this subject.

- o *Transference / Applicability to the U.S.:* Information from the interview is thought to be generally applicable to U.S. installations.
  - *Regulatory:*
    - United Airlines did a pilot in Chicago. Gave frequent flyers plastic bag tags with RFID label installed to expedite drop-off for customers. Agents will attach regular bag tags behind the scene. TSA is not an obstacle, but a necessary part of the process. TSA is supportive of these types of initiatives. This support was seen in United Airlines pilot. Obstacles to adoption in U.S. process decision being driven by airlines deciding how they want to serve their customers.
  - *Finance:* The interview did not yield any useful information on this subject.
  - *Commercial:* The interview did not yield any useful information on this subject.
  - *Employee:* The interview did not yield any useful information on this subject.
  - *Technology:*
    - Self-tagging is the natural evolution of the airport development process. From a technology standpoint, self-service revolution is still in progress. Technology and process efforts will be around expanding the self-service experience. It won't be the only process, but will allow multiple channels for processing passengers.
    - Cell phone check-in and kiosks are here to stay.
    - IER expects more deployment of common use kiosks through airports rather than proprietary airline-owned in future.
    - IER is offering an automated bag drop solution using RFID labels.
  - *Facility Impact:* The interview did not yield any useful information on this subject.
  - *Customer Acceptance:* The interview did not yield any useful information on this subject.

- e) *Interviewee:* Business Development Manager, Vanderlande Industries
  - *Synopsis:* Vanderlande is a systemic solution that is automated rather than using agents. Vanderlande works together with BagDrop solution, which is more costly for hardware, but significantly reduces the need for personnel.

  - o *Highlights:*
    - *Transaction Analysis:* The interview did not yield any useful information on this subject.
    - *Assessment of Installations:* The interview did not yield any useful information on this subject.
    - *Operational Assessment:* The interview did not yield any useful information on this subject.
    - *Assessment of Business Case:* The interview did not yield any useful information on this subject.
    - *Roadmap for Further Employments:*

- Self-tagging implemented at Schiphol and now being expanded there. Company did a trial with two units, that trial is being expanded.
- Passenger printing at home raises two issues: a) Do they have the right type of label that can be readable by bag readers that will require manual sortation; and b) the label for BagDrop only sticks it to itself.
- Vanderlande believes that RFID is the future and is working on T3 in Vegas using 100% RFID utilizing Gen2 technology from U.S. This has been implemented with single airline solutions at the moment but the company is working towards common use standards

- *Design Recommendations:* The interview did not yield any useful information on this subject.

o *Transference / Applicability to the U.S.:* Information from the interview is thought to be generally applicable to U.S. installations.

- *Regulatory:* Regarding the pilot at Schiphol, the TSA may see it as a risk to behavioral analysis. Can provide a better feeling of security because passenger is responsible for their bags. There is still a manned area with the automated area where the agent is comingling with the passengers.
- *Finance:* The interview did not yield any useful information on this subject.
- *Commercial:* The interview did not yield any useful information on this subject.
- *Employee:* The interview did not yield any useful information on this subject.
- *Technology:* The interview did not yield any useful information on this subject.
- *Facility Impact:* The interview did not yield any useful information on this subject.
- *Customer Acceptance:* The interview did not yield any useful information on this subject.

f) *Interviewee:* Director of Business Development, SITA
o *Synopsis:* SITA fully supports self-tagging, is an active participant in fast travel, and they have an application in production for common use platforms. Company worked with Montréal to bring self-tagging to North America.

o *Highlights:*
- *Transaction Analysis:* The interview did not yield any useful information on this subject.
- *Assessment of Installations:* The interview did not yield any useful information on this subject.
- *Operational Assessment:* The interview did not yield any useful information on this subject.
- *Assessment of Business Case:* The interview did not yield any useful information on this subject.
- *Roadmap for Further Employments:*
  - The Problem with RFID is cost. Ability to have a standard RFID infrastructure is an issue. It took 6 years to get bar-coded boarding passes

standardized. Airlines with restricted environments, such as Air New Zealand, can invest in RFID infrastructure.
- Inhibitors to self-tagging include: government security approval, changes in sortation systems, user acceptance. IATA's simplified bag tag will help.
- *Design Recommendations:* The interview did not yield any useful information on this subject.

o *Transference / Applicability to the U.S.:* Information from the interview is thought to be generally applicable to U.S. installations.

g) *Interviewee:* Director of Technology and Research, Business Analyst, Alaska Airlines
o *Synopsis:* Alaska Airlines did passenger self-tagging about 10 years ago in Anchorage and again in Portland before 9/11. They are looking at this again and are testing a kiosk self-tagging process at Redmond, Oregon. The software is developed and the hardware is available. Current issues are getting regulatory approval for the trial.

o *Highlights:*
- *Transaction Analysis:* The interview did not yield any useful information on this subject.
- *Assessment of Installations:* Previous implementations have good signage and a video to assist passengers. There was no agent support. Very few passengers chose the self-tagging option. In Anchorage, the kiosk was not prominent.
- *Operational Assessment:* The interview did not yield any useful information on this subject.
- *Assessment of Business Case:* The interview did not yield any useful information on this subject.
- *Roadmap for Further Employments:* The interview did not yield any useful information on this subject.
- *Design Recommendations:* Good instructions. Agent assist.

o *Transference / Applicability to the U.S.:* Information from the interview is thought to be generally applicable to U.S. Installations.
- *Regulatory:* Need approval for trial.

h) *Interviewee:* Passenger Strategy Team, BAA Heathrow
o *Synopsis*: Phone interview with Passenger Strategy Team member for BAA. During interview, BAA member discussed current and future plans for self-tagging. Specific information provided below.

o *Highlights:*
- *Transaction Analysis:*
- They are jointly working with Air Canada on statistics. The Air Canada system allows passengers to drop off their bags in less than 30 seconds.
- *Assessment of Installations:*

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- Kiosks are located in areas of airlines implementing self-tagging. BAA CUSS kiosks can print bag tags for the Air Canada system, and SAS uses dedicated kiosks in their area.
- The Air Canada self-tagging system uses an active/inactive system, provided by Brock Solutions, using their "SmartDrop" system. It's the only U.S. solution that has received approval by the TSA for transborder use, with deployments in London Heathrow for flights to Canada.   The system is approved by the UK DfT (Department for Transport) and Transport Canada. The SmartDrop system is currently used by Air Canada in a dedicated mode at London Heathrow.
- Related issues include: At Terminal 1, Star Alliance uses a common bag drop. This is a set of desks operated by one ground handler (Menzies) who accept bags for Lufthansa, TAP, LOT, and others. At Terminal 3, the Oneworld alliance is in the same building but not in the same area and it offers a mix of short and long haul services. There is potential for common bag drop developing over time. Skyteam in Terminal 4 is operating a common bag drop for some carriers; this is achieved by a single ground handler (KGS) operating this service. Current CUSS kiosks are IER 978B models, with some older IER 978. Heathrow is currently investigating the option of replacing / upgrading. The IER models were built to accommodate bag-tag stock and software.
- *Operational Assessment:*
  - Passengers self-tag their own bags; they will need to use a SmartDrop desk as SmartDrop performs the necessary bag activation. The Air Canada self-tagging solution prints inactive tags. The SAS solution prints active tags. SAS kiosks must be in a controlled area, demarked by barriers to prevent passengers leaving the area with tagged bags. The Air Canada (Brock) solution allows passenger to use kiosks located anywhere inside or outside the terminal for bag-tag printing. This is much more efficient use of space. Bags are not weighed at the kiosks. Actual weights are determined at the bag drop off. The bag drop-off process is described as a secure transaction involving scanning the passenger's boarding pass and each bag tag. Air Canada work on a "per-piece" system for bag weight rather than an "individual-weight" system. Bags are weighed and overweight bags rejected for repacking. Out of gauge is also redirected to the appropriate location.
  - BAA kiosks are provided and maintained by IER. There is a local support team in the terminal who deals with ad hoc maintenance like paper stock refilling.
- *Assessment of Business Case:* The interview did not yield any useful information on this subject.
- *Roadmap for Further Employments:*
  - Have conducted self-tagging for the past two years with SAS; Air Canada started around May 2009. They are seeking other airline opportunities. In some ways, Virgin Atlantic may be the greatest advantage for the future.

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- BAA sees significant potential and wants a home based carrier to adopt self-tagging.
- BAA is considering off-site locations for bag drop off and self-tagging. Aer Lingus is pursuing self-tagging—this is something they do in Dublin with unmanned bag drops. Unmanned bag drops in the UK would require DfT approval.
- BMI is interested in self-tagging, but maybe at a smaller airport location before deploying at Heathrow. Department of Transport data may be on the Extranet.
  - *Design Recommendations:* The interview did not yield any useful information on this subject.

  o *Transference / Applicability to the U.S.:* Information from the interview is thought to be generally applicable to U.S. installations.
  - *Regulatory:* Certain issues to overcome include: potential compliance with future regulatory decisions with active and nonactive bag tags may still be ongoing. At present, the SAS prints active bag tags. The DfT has allowed this, since SAS partitions off the area. Both AC and SAS have manned counters as bag drops—in the future dispensation will be needed to operate a fully unmanned bag drop point.

i) *Interviewee:* CEO, BagDrop Systems
  o *Synopsis:* Phone interview with CEO of BagDrop Systems. The company is actively involved in pushing toward acceptance in U.S. market. It will be at check-in and would like a trial in the U.S. BagDrop systems allow a greater level of security between public and secure areas.

  o *Highlights:*
  - *Transaction Analysis:* The interview did not yield any useful information on this subject.
  - *Assessment of Installations:*
    - BagDrop system is ideal for passengers who have already purchased a ticket, checked in, and have the boarding pass.
    - Company offers cohesive baggage tag that sticks to itself and nothing else. It is also simple and easy to apply. Permanent.
  - *Operational Assessment:* The interview did not yield any useful information on this subject.
  - *Assessment of Business Case:* The interview did not yield any useful information on this subject.
  - *Roadmap for Further Employments:*
    - RFID is part of the plan in the future but will require backward compatibility. Can allow check-in function, but most airlines want to push passengers to check-in prior.
    - Print-at-home tags and permanent RFID tags are allowable in BagDrop machines if compliant.

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- *Design Recommendations:* The interview did not yield any useful information on this subject.

- o *Transference / Applicability to the U.S.:* Information from the interview is thought to be generally applicable to U.S. Installations.
  - *Regulatory:* They acknowledge the differences between Europe, U.S., and Asia in regard to regulatory issues. Operational concept is straightforward domestically, yet internationally it is complex.

j) *Interviewee:* Export Manager, Bartsch International
  - o *Synopsis:* Phone interview with Export Manager of Bartsch International. As a company, Bartsch provides a unique bag tag to the industry.

  - o *Highlights:*
    - *Transaction Analysis:* Use of Bartsch tag increases usage, reduces number of failures and average time to tag significantly in field tests
    - *Assessment of Installations:* The interview did not yield any useful information on this subject.
    - *Operational Assessment:* The interview did not yield any useful information on this subject.
    - *Assessment of Business Case:* The interview did not yield any useful information on this subject.
    - *Roadmap for Further Employments:* There is an upcoming trial with Luftansa at Munich starting September 2010. Data will be available after the trial.
    - *Design Recommendations:* The interview did not yield any useful information on this subject.

  - o *Transference / Applicability to the U.S.:* Information from the interview is thought to be generally applicable to U.S. installations.
    - *Regulatory:* The interview did not yield any useful information on this subject.
    - *Finance:* The interview did not yield any useful information on this subject.
    - *Commercial:* The interview did not yield any useful information on this subject.
    - *Employee:* The interview did not yield any useful information on this subject.
    - *Technology:* The interview did not yield any useful information on this subject.
    - *Facility Impact:* Use of self-service increases throughput per kiosk to approximately 55,000 passengers / year (150 passengers per day).
    - *Customer Acceptance:* Customers are afraid to use for the first time, however surveys indicate that 75% of all passengers indicate that they would use Bartsch's tag because it saves time and is easy to use.

k) *Interviewee:* IT Manager, Greater Orlando Airport Authority
  - o *Synopsis:* Phone interview with the IT Manager of the Greater Orlando Airport Authority. During the interview, the Manager discussed current progress with

self-tagging. He noted that the airport would like to do a trial for self-tagging, but needs two airlines to participate.

- o *Highlights:*
    - ▪ *Transaction Analysis:* The interview did not yield any useful information on this subject.
    - ▪ *Assessment of Installations:* Currently, there are programs for remote bag drop.   The airport has a new inline baggage system.
    - ▪ *Operational Assessment:* The airport has highly seasonal traffic.
    - ▪ *Assessment of Business Case:* Self-tagging aligns with City of Orlando's remote bag drop business model (Disney Magical Express).
    - ▪ *Roadmap for Further Employments:* Some airlines are moving to common use, or have done CUPPS trials. Another airline is pursuing self-tagging in another airport using dedicated kiosks.
    - ▪ *Design Recommendations:* The interview did not yield any useful information on this subject.

- o *Transference / Applicability to the U.S.:* General information provided is applicable for other U.S. installations.

l) *Interviewee:* Disney Magical Express
- o *Synopsis:* Currently, Disney Magical Express (DME) has a luggage service for Disney Resort customers. Passengers are given special tags to affix to their bags. After the passengers checks in at their home airport, the bag is tagged with the airline's bag tag in addition to the DME tag. DME is responsible for collecting bags at baggage retrieval and delivering the bag to the passenger's room, essentially becoming part of the chain of custody for the bag. If the passenger is flying an airline with a remote check-in desk at the resort, the passenger can check the bag in at the resort and DME will deliver it to the airport for screening. In both cases, the passenger must travel with the bag on the Disney coach to and from the airport.

- o *Highlights:*
    - ▪ *Transaction Analysis:* A high percentage of the seasonal travelers in the airport are Disney Resort customers. DME is used most during high season, and thus addresses the peak usage time.
    - ▪ *Assessment of Installations:* Remote check-in is not universally available. Some airlines do not maintain remote check-in desks at the resorts.
    - ▪ *Operational Assessment:* Space at the airport is required for the bags delivered by DME. Supplementary screening facilities are required to avoid overloading.
    - ▪ *Assessment of Business Case:* The interview did not yield any useful information on this subject.
    - ▪ *Roadmap for Further Employments:* The interview did not yield any useful information on this subject.

- - *Design Recommendations:* The interview did not yield any useful information on this subject.

    - o *Transference / Applicability to the U.S.:* Information from the interview is thought to be generally applicable to U.S. installations.
        - *Regulatory:* The passenger is validated at the remote check-in. DME accepts the bag and it is then under the control of DME to the airport.
        - *Finance:* The interview did not yield any useful information on this subject.
        - *Commercial:* This is provided as a service to the Disney resort passengers.
        - *Employee:* The interview did not yield any useful information on this subject.
        - *Technology:* The interview did not yield any useful information on this subject.
        - *Facility Impact:* Allows check-in at remote site, alleviating congesting in the check-in lobby at the airport.
        - *Customer Acceptance:* Customers like not having to deal with their luggage at the airport and the streamlined check-in process.

m) *Interviewee:* Print-O-Tape
    - o *Synopsis:* Print-O-Tape is providing products to RDU, SJC, Fresno, United, US Air, Southwest, Midwest, Frontier, and Aer Lingus. Print-O-Tape manufactures its own materials where competitors buy finished products that they slit down and print.

    - o *Highlights:*
        - *Transaction Analysis:* The interview did not yield any useful information on this subject.
        - *Assessment of Installations:* The interview did not yield any useful information on this subject.
        - *Operational Assessment:* The interview did not yield any useful information on this subject.
        - *Assessment of Business Case:* The interview did not yield any useful information on this subject.
        - *Roadmap for Further Employments:* They currently stock 21-inch tags and are planning for print-at-home options. Recommendations that were provided include fanfold stock that will provide greater capacity.
        - *Design Recommendations:* Instructions on the tag are critical, there must be the right marriage between the printer and the design of the tag, and it would be beneficial to get the printer manufacturer, label maker, common use vendor, and airline in a room together to define specifications.

    - o *Transference / Applicability to the U.S.:* Information from the interview is thought to be generally applicable to U.S. installations.
        - *Regulatory:* The company stated that in previous discussions, TSA had concerns about tags that could be removed and reapplied.

n) *Interviewee:* Operations, Seattle-Tacoma

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- ○ *Synopsis:* The airport has both common and dedicated use. The primary airline has a two-step process, self-service kiosks for check-in, and agent-assisted bag drop. The airport has an initiative toward self-service and common use. They are motivated to mount a trial for PST when the regulatory issues can be addressed. Current lobby has space limitations. The lobby is wide and shallow with traditional check-in counters at the back of the lobby. Because of the shallowness, there is often congestion in the lobby before flights. The airport is also subject to congestion because carriers are concentrated in a small area of the lobby. There is often congestion in one section of the lobby, while the rest of the lobby is relatively underused. The airport would like to be able to spread out carriers to alleviate the congestion. Also, the airport will be losing ticket counter space in the near future, so they need to be more efficient in the use of space.

- ○ *Highlights:*
  - ▪ *Transaction Analysis:* The need to improve transaction throughput, and the need to disperse passengers better in the lobby are drivers for new technologies.
  - ▪ *Assessment of Installations:* There are several bag sortation systems at the airport. This makes common bag drop more difficult.
  - ▪ *Operational Assessment:* The major airline is adamantly dedicated use, but many of the international and smaller carriers are accepting of common use and self-service.
  - ▪ *Assessment of Business Case:* The interview did not yield any useful information on this subject.
  - ▪ *Roadmap for Further Employments:* The interview did not yield any useful information on this subject.
  - ▪ *Design Recommendations:* The interview did not yield any useful information on this subject.

- ○ *Transference / Applicability to the U.S.:* Information from the interview is thought to be generally applicable to U.S. installations.
  - ▪ *Regulatory:* Need agreement from the TSA to pilot passenger self-tagging.
  - ▪ *Finance:* There may be substantial costs in an all-airport implementation of self-tagging because of the multiple baggage systems.
  - ▪ *Commercial:* The interview did not yield any useful information on this subject.
  - ▪ *Employee:* The interview did not yield any useful information on this subject.
  - ▪ *Technology:* A major problem currently is the quality of printed bag tags. If the kiosks were airport-owned, that could be better controlled.
  - ▪ *Facility Impact:* There will probably need to be case work and baggage system modifications to accommodate self-tagging.
  - ▪ *Customer Acceptance:* Many passengers are already using self-service at the major airlines self-service kiosks.

o) *Interviewee:* Senior Manager—Airport Automation and Software, US Airways

- o *Synopsis:* The airline has done some research and limited trials. There are no current plans for further trials or implementation although there is still interest at the airline. The regulatory issues have to be resolved first. No specific highlight given.

p) *Interviewee:* Head of e-Services, Swissport at Zurich Airport
- o *Synopsis:* Zurich has bag tag printers in 85% to 90% of kiosks. All European airlines do self-tagging. There are no concerns and everything is done according to standard. If passengers have trouble applying a bag tag, they can take the tag to the bag drop and an agent can apply the tag there. Internet check-in passengers go directly to the bag drop. Their bag tags are printed at bag drop printers. According to Swissport, the process works pretty well, but it could be improved with better tags, that are easier to apply, and come with better instructions. Swissport is looking for better tags. Company is also evaluating printing bag tags at home. There are some self-service bag drop locations. Boarding passes are correlated with bag tags.

- o *Highlights:*
    - *Transaction Analysis:* There is no available data, but experience has shown that transaction rate is acceptable.
    - *Assessment of Installations:* Provisions are made for web check-ins so that those passengers can bypass the kiosk and go directly to bag drop. All airlines do self-tagging. Help is available to passengers with problems in self-tagging.
    - *Operational Assessment:* Passengers learn to tag their bags. The learning curve is probably about two years, since some passengers fly infrequently and it takes a few times to become proficient and comfortable with the process.
    - *Assessment of Business Case:* It is long practice to self-tag. No business case available.
    - *Roadmap for Further Employments:* The interview did not yield any useful information on this subject.
    - *Design Recommendations:* The interview did not yield any useful information on this subject.

- o *Transference / Applicability to the U.S.:* Regulatory information not applicable to U.S. installations. Other areas of information, generally applicable.
    - *Regulatory:* There are no concerns.
    - *Finance:* The financial benefits are well known.
    - *Commercial:* The interview did not yield any useful information on this subject.
    - *Employee:* Efficiencies allow better scheduling of staff.
    - *Technology:* The interview did not yield any useful information on this subject.
    - *Facility Impact:* Efficiencies maximize use of the lobby space.
    - *Customer Acceptance:* Customers learn the process and become adept at it.