AIAS Winter Storm Efficiency Study

Benefit Cost Analysis of Aircraft Controls

Task 2

BCA of Aircraft Controls – Original Scope

Task 2

- Determine how AIAS categorizes success
- Evaluate space inventory and confirm it is being maximized
- Guidance on controlling, prioritizing, and/or slotting aircraft
- Conduct cost benefit analyses

Benefit Cost Analysis Factors

Task 2

Items Factoring into Cost Stream

- Aircraft taxi times
- Aircraft turn around times
- Additional technology
- Additional infrastructure
- Additional personnel
- Additional crew hours
- Additional software

Items Factoring into Benefit Stream

- Reduced taxi times
- Better hardstand utilization
- Increased cargo aircraft capacity
- Fewer diversions

Data Required to Perform Benefit Cost Analysis

Task 2

- Cargo flight schedules
- “Normal” flight day
- Planned OOOI (out, off, on, in) times for flights
- Actual OOOI times for flights
- Nature of operations (tech stop, cargo up/down load, crew change, etc.)
- Snow clearing times (for apron availability)
- Per minute cost of operations by aircraft type and carrier
- Anticipated turn times by carriers

Benefit Cost Analysis Challenges

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- Insufficient data available to perform full CBA
- Data integrity concerns
- Sources of OOOI data contradict each other
  - Cargo flights not required to report actual data to the US Department of Transportation
  - Cargo flights not recorded in the FAA Enhanced Traffic Management System (ETMS) as reliably as passenger flights
  - Airport resource management system (RMS) data was incomplete on snow event days
  - Radar vendor data (e.g. FlightAware, Flight Radar 24) depends on both FAA data and public data feeds. Public data feeds may have data integrity concerns due to location of receivers affecting capture and quality.

Benefit Cost Analysis Challenges continued

Task 2

- Potential solution
  - Rather than analyze incomplete data from previous events, build a new scenario
    - Build design day flight schedule (DDFS) for Airport administered parking positions
    - Produce Gantt chart and record gate delays for a normal operations day for a baseline
    - Design scenario parameters for a snow event (will take a meeting with available ops/maintenance staff) with different numbers of available hardstands and durations of time per stand.
    - Create Gantt chart and record gate delays
    - Evaluate the effect of the scenarios on the min/max number of hardstands available

Revised Scope

Task 2

- Evaluate software solutions to address data collection and deficiencies for future analyses (Aerobahn)
- Potential controls to implement (e.g. prior permission required, maximum layover times, etc.)
- Analyze parking locations by activity (e.g. tech stop, AOG's, cargo on/off loads)

Evaluate Software Solutions for Data Collection - Aerobahn

Task 2

- Surface management system developed by Saab Sensis
- Customers include
  - Airlines
  - Airports
    - Some airports leverage airline Aerobahn systems for their own analyses (under mutual agreement)
  - Air Navigation Service Provider (ANSP)
- Integrates multiple data sources (ASDE-X, ADS-B, airlines schedules) for surveillance and metric generation
- Can provide OOOI times

Aerobahn continued

Task 2

Aerobahn fills in gaps when certain data sources are incomplete

- Uses surveillance information to determine gate arrival and departure times if OOOI data is lacking
- Similarly, can derive hardstand occupation and long-term parking usage

Default and custom reporting can be exported to spreadsheets for fast and easy analysis

- Taxi Times
- Gate and hardstand usage
- Remain over night (RON) study

Can provide real-time monitoring of airfield during snow events

Potential Controls

Task 2

- Prior Permission Required (PPR)
  - 24-48 hours before arrival of severe storm, issue NOTAM requiring PPR from gate management
    - A 48-hour window would be preferred to effectively account for Trans-Pacific traffic
    - Would serve a similar function as the FAA Air Traffic Control System Command Center (ATCSCC), albeit on a smaller scale, managing demand on a finite resource, in this case Airport administered hardstands,
  - Las Vegas (LAS), for the last several years, and Boston (BOS) more recently on a more temporary basis, have issued similar type NOTAMS for arrival control due to constrained General Aviation (GA) parking
    - (Harry Reid International is closed TO NON-SKED TRANSIENT GA ACFT EXC 24HR PPR 702-261-7775)

Potential Controls continued

Task 2

- Prior Permission Required
  - Would allow ANC to better determine the volume and type of demand requiring the Airport Administered hardstands
  - Upon receipt of a call for PPR, obtain type of operation to assist in determination of parking location
  - Potential starting point for slot system, with each Airport administered parking spot being a designated slot that has an associated arrival/use time frame with it. (See maximum layover times)
  - Adjustments to slot parking will likely be required during event due to unforeseen aircraft/airline/handling issues

Potential Controls continued

Task 2

- For fueling tech stops only, and for airlines with a small number of operations, FAI could be recommended as alternative refueling location. Maybe include monetary incentive for cooperation (e.g. reduced landing and/or parking fees. Prior approval from AAAC likely required)
- Should an aircraft show up without PPR, it might mean that the carrier ignored NOTAM and was dispatched to a closed airport. Such cases should be referred to FAA Flight Standards as this could be considered a violation of FAR 91.13, Careless and Reckless operation

Potential Controls continued

Task 2

- Maximum Layover Times
  - Average estimated time needed for refueling tech stop, according to operations, is 60 - 90 minutes
  - During winter storm operations, airport takes control of all preferentially leased Airport administered parking spots and temporarily (until event is over) reduces parking durations to no more than 120 minutes (leaseholders will need to be advised of this potential prior to next seasons lease term
  - 4-hour turns should not be permissible during snow emergency

Potential Controls continued

Task 2

- Analyze Parking Locations
  - North Terminal
    - Continue to utilize North Terminal for AOG aircraft, whether known prior to or after landing
    - Continue to utilize North Terminal for carriers that choose to schedule long (exceeding 120 minutes) ground times for tech stops
  - Airport Administered Parking Positions (“Romeo spots”)
    - Continue to utilize these positions for tech stops
    - Claw back provisions should be enacted for preferentially leased spots during snow emergencies
    - Utilize Romeo spots for snow storage as a last resort. Consider contract snow removal to keep spots clean and available for carriers

Potential Controls continued

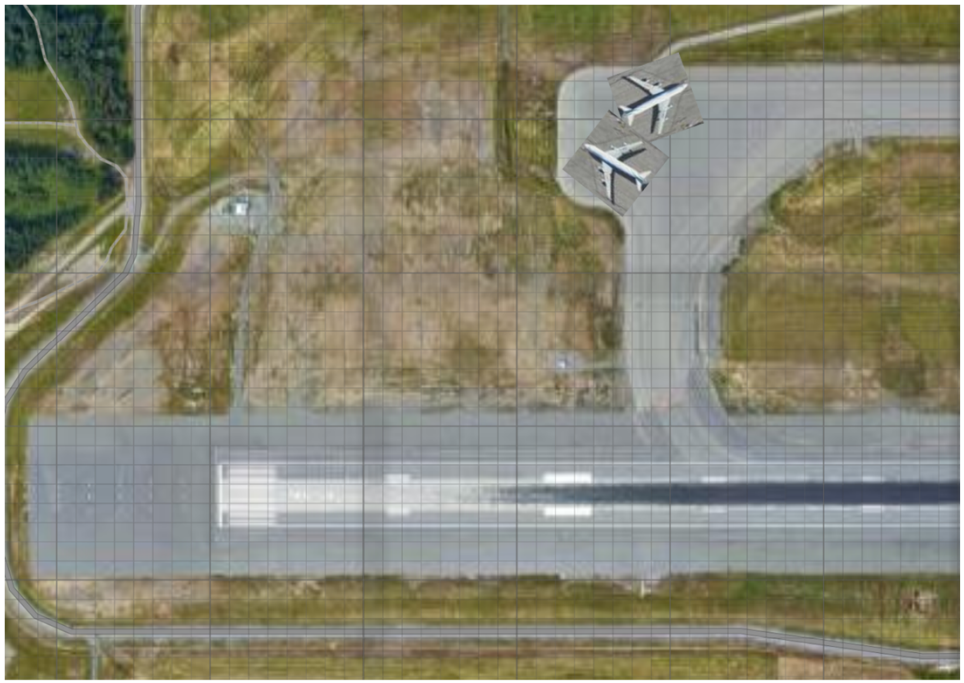
Task 2

- Analyze Parking Locations
  - "Papa Spots"
    - Because of the amount of activity and equipment associated with cargo transfer operations, during snow emergencies, these aircraft could be parked on the "Papa" spots to reduce congestion for the other Airport administered parking locations
    - If no cargo transfer is planned, these positions could also be used for similar reasons for utilizing the North Terminal. (AOG aircraft, long planned ground times, etc)
    - Possible configuration (photo is for illustrative purposes only)

Potential Controls continued

Task 2

- Analyze Parking Locations
  - Taxiway Juliet
    - Continue utilizing Taxiway Juliet for parking/staging of up to two aircraft until Airport administered parking is available (photo is for illustrative purposes only)



Potential Controls continued

Task 2

- Analyze Parking Locations
  - Taxiway Yankee
    - Continue to use Yankee taxiway as a last resort to hold/park aircraft
    - To potentially reduce taxi time, operations had suggested parking and taxiing aircraft southbound to facilitate utilizing both taxiways Mike and Lima to access the assigned “Romeo” parking. (photo is for illustrative purposes only)

Potential Controls continued

Task 2

- Analyze Parking Locations
  - Taxiway Lima
    - Operations has stated that aircraft exceeding holdover times can impact the departure rate and slow the turnover of Airport administered parking positions
    - Use of a car wash type of operation on the taxiway prior to the aircraft departures on Runway 33, could reduce the number of aircraft that have to return to the blocks to deice again according to operations

- Airport would have to require ground handlers to participate and settle up could be done after the event has ended. Would have to change ground handler lease wording and evaluate whether enough snow removal equipment would be available (photo is for illustrative purposes only)

Summary

Task 2

- This task was the first of its kind
- Tough to improve what is already best in class (Balchen/Post AAAE winner 3 years running for best snow removal operations for large airports
- Need better data for in-depth analysis
- Aerobahn software could supply data and assist with future analysis
- Prior Permission Required procedures could lead to the development of slotting concepts
- Most of the existing control procedures should be continued
- Some variations suggested by operations to existing procedures could have positive impact
- Third-party cargo developments could help alleviate parking congestion as early as next season