Optimizing Connectivity Tools

Background

- In building a profitable schedule, it is crucial to optimize connectivity.
- The process can be done while the entire schedule is being optimized or manually adjusted after the schedule is built.
- Here are three tools to help achieve this goal.

Tool Requirements

- To optimize the Origin and Destination (O&D) traffic in a schedule, you will need a tool that can retime flights and quickly measure the impact of retiming flights.
- In a previous presentation, we showed a tool we called “QuickCAST” that would meet this need of retiming and re-forecasting.
- QuickCAST determines the system revenue impact when a flight is re-timed, assuming every other input remains unchanged.

New Tools

- Flight Scheduling Retime Tool
  - Automates dynamic shifting of flight times during the main optimization phase to maximize Origin & Destination (O&D) network efficiency.

- Misconnect Report Tool
  - Acts as a diagnostic recovery tool. It flags high-value connections that narrowly missed the minimum connection time (MCT) and suggests minor time shifts to salvage that revenue.

- Schedule Passenger Quality Score Tool
  - Provides a benchmarking metric. It scores and compares the overall passenger experience and connectivity baseline of a raw schedule against an optimized version.

Flight Scheduling Retime Tool

- Leverages the QuickCAST forecasting engine to determine optimal network O&Ds. Automatically executes flight time adjustments while keeping all other system inputs completely static.

Misconnect Report Tool

- A comprehensive review of O&D network changes is required after a new schedule is built and forecasted.
- Broken passenger connections must be analyzed to accurately quantify lost revenue and impact on customer service.
- High-value connections—particularly in low-frequency markets—can be inadvertently severed by flight retiming or cancellations.

Misconnect Report Tool (Example)

The Problem: Flight 123 from XXX arrives at YYY at 5:00 PM. Connecting Flight 456 to ZZZ departs YYY at 5:40 PM. The airport's Minimum Connection Time (MCT) is 45 minutes. Because the window is only 40 minutes, 15 passengers will legally misconnect, costing the airline $15,000 in lost revenue.

The Tool's Solution: The tool flags this specific $15,000 loss and automatically recommends retiming Flight 123 to arrive just 10 minutes earlier (at 4:50 PM). This safely opens a 50-minute connection window, secures the passengers, and captures the $15,000.

Schedule Passenger Quality Score Tool

- Define a baseline by selecting an unoptimized flight schedule (Target Schedule).
- Run an unconstrained O&D network optimization to establish a theoretical upper bound (Perfect Schedule).
- Compare the Target Schedule against the Perfect Schedule to benchmark lost revenue opportunities and guide manual refinements.

Schedule Passenger Quality Score Tool (Example)

- Target Schedule captures 82% of all potential market O&D revenue.
- The unconstrained Perfect Schedule establishes a theoretical maximum of 100% revenue capture.
- This gives your network a Quality Score of 82. The remaining 18% represents a $20 million "Optimization Gap“. Planners can now use this score to track their progress as they manually tweak flights to close that gap and push the score closer to 90+.