Predictive Airport Analytics

Combining data science, analytics and weather to streamline airport operations

The Weather Company

An IBM Business

- Gain situational awareness at major hub airports
- Better understand fuel requirements
- Reduce taxi time and fuel waste
- Operate more efficiently to support efficient departures and arrivals
- Mitigate downstream propagation

The cost of delays

Airport delays cost airlines millions of dollars every year. While these delays are often foreseeable they appear to be unavoidable. Because most airlines consolidate their operations into just a few hub airports, delays can propagate throughout the system. A two hour delay at 8:00 AM can equate to eight hours of propagated delays throughout the day.

Forced into airing on the side of safety, dispatchers and schedulers all too often add buffer time and overestimate fuel requirements. Operating on intuition and personal knowledge, airlines are making the best decisions they can using the most and best data that they can assemble at the time. In today's era of technology and data, this approach is no longer good enough.

What if we used all the available data?

There is a huge amount of data available that could enhance decision-making. We know the number of flights, and their taxi times. We know the capacity of airports and their historic operational behavior. And, we have confidence in forecasting weather's impact on operations. The scale of this data has never been larger and more prolific. One of the biggest problems airlines face today is integrating big data into their operations for real-time decision making. There is a trend for airlines to integrate big data into their flight operations for better outcomes.

"An airline operating 300 flight per day from the 3 NYC area airports could expect $1.2 million in operational savings annually."
-Dr. Alex Huang

Meeting the Competition

Competition is fierce. It's important to use the information at your fingertips to create actionable knowledge for your operations. That means harnessing data from multiple channels in multiple formats: historical weather observations (METAR), weather forecasts (government TAF, WSI TAF, and WSI Proprietary Weather Forecast Platform), historical flight data (ASDI, ASDE-X and EFD archive), real-time flight data (ASDI and ASDE-X) and historical airport operational data (FAA airport operations archive).

Data models and algorithms let airlines go far beyond best guesses. The technologies are validated against historical data. Airport Analytics will provide airlines insights on future airport operational conditions to help them proactively handle their operations based on the insights. And, as more airlines adopt these tools, delays related to weather and congestions can be minimized.

Opportunities for airlines

During peak capacity times, it's important to manage and limit holding patterns and extended taxi-times. There are ways to know if your aircraft will run out of fuel. When weather strikes, airlines obtain insight on the expected behaviors of airports (for example, congestion and runway configuration) using airport analytics. Hence, airlines can plan accordingly to reduce delay and improve operational efficiency.

A better way

The solution is to combine historical airport operational data, flight data and weather forecasts into a single system that you can use to see and understand congestion patterns at major airports, and take appropriate actions. In other words, you can forecast airport operations conditions as you would the weather!

Features

Congestion prediction

Forecast airport congestion 12-hours out
– View Predicted Airport Capacity and Future Flight Demand Capacity Imbalance
– Predict airport congestion level with fresh data updated every 15 minutes

Runway configuration prediction

Foresee arrival and departure runaways
– Display current and future runway configurations
– View timing of runway configuration changes over a twelve hour period

Taxi time prediction

Know how long it will take you to get from gate to runway
– Takes the guesswork out of fueling for taxi
– Uses individual flight records against airport congestions and conditions
– Takes into account terminal and runway positions

The Weather Company Solution

WSI Airport Analytics delivers the above capabilities in an easy-to-use, powerful upgrade to WSI's Fusion Surface Movement Package. Offering the only solution to pair historical airport operational data with superior weather forecasting, it provides airlines with actionable operational predictions. WSI Surface Movement with Airport Analytics is the only solution to bring the power of big data to carriers' airport operations.

About The Weather Company, an IBM Business

The Weather Company, an IBM Business, helps people make informed decisions and take action in the face of weather. The company offers the most accurate forecasts globally with personalized and actionable weather data and insights to millions of consumers, as well as thousands of marketers and businesses via Weather's API, its business solutions division, and its own digital products from The Weather Channel (weather.com) and Weather Underground (wunderground.com).

The company delivers around 25 billion forecasts daily. It's products include the world's most downloaded weather app, a network of 250,000 personal weather stations, a top-20 U.S. website, one of the world's largest IoT data platforms, and industry-leading business solutions.

Weather Means Business™. The world's biggest brands in aviation, energy, insurance, media, and government rely on The Weather Company for data, technology platforms and services to help improve decision-making and respond to weather's impact on business.

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