Fort Lauderdale Int’l Uses Surface Optimization Tech to Increase Capacity Without Adding Gates
South Florida is a hot tourist area, with air traffic increasing steadily for the last few years. To cope with overall passenger growth and seasonal swings, Fort Lauderdale-Hollywood International Airport (FLL) is leveraging information technology and automation.

In September, FLL rolled out a new collaborative surface optimization system to increase traffic flow and capacity. One major goal is reducing delays and congestion. Officials expect to deploy the new system airport-wide by the first quarter of 2018.

The company’s technology partner is PASSUR Aerospace, a firm that specializes in business intelligence, predictive analytics and big data. Mike Nonnemacher, FLL’s acting assistant director of aviation, saw PASSUR’s predictive analytics in action at John F. Kennedy International a few years ago and had kept the company on his radar.
As traffic continued to increase, the airport created a plan to maximize its gate and ramp space with technology rather than construction. Working with JetBlue and other airlines, the FLL team focused on putting data to work to solve traditional industry challenges and issues specific to South Florida’s tourist-centric demographics.

“What we’re trying to do is stay ahead of the power curve—the busy season—and seeing what we need to do with the tarmac and the gates at the airport,” says Joe Bertapelle, director of Strategic Airspace Programs for JetBlue. “You take sticks and bricks, combine the tarmac, congestion and the expansion of two major airlines, and you have to [consider] how to adjust.”

Tech to the Rescue
Fueled by warm-weather tourism and two major cruise ports, FLL has been one of the fastest-growing airports in the country. Last year alone, it experienced an 8.4% increase in traffic, and there is no slowdown in sight. With more than 700 flights per day, the airport offers nonstop service to more than 75 U.S cities and connections to more than 60 international destinations in 30 countries.

Nonnemacher has been with the Broward County airport for 30 years, and has seen the dramatic growth firsthand. When he started at FLL, passenger throughput was about 4 million; now, it’s pushing 32 million. The airport is considered a low-cost option for passengers traveling to South Florida, he notes. Unlike its sister airport in Miami, FLL is mainly a destination airport rather than a hub—a dynamic that breeds its own set of challenges.

FLL officials know that passengers expect the airport to respond quickly and effectively to mitigate major onboard delays and relieve congestion in the terminal caused by diversions, cancellations, weather events and other incidents that disrupt schedules. That’s where its new surface optimization system comes in.

“Customers base their meetings, cruise ship appointments, ground transport, etc. on flight times,” says Doug Hofsass, senior vice president of Global Airports & Business Aviation for PASSUR. “It’s important we help manage expectations.”

FLL’s new system uses data mining and pattern recognition of historic records to predict specific, detailed operational outcomes, and then generates associated recommendations via specialized algorithms. As a result, it allows the airport and airlines to prioritize high-value flights, reduce the number of aircraft waiting to gate-in or take off, and sequences arrivals and departures to maximize gate efficiency and minimize taxi time, explains Hofsass. In addition, the airlines can coordinate with air traffic control, ground operations and fellow carriers to maximize the available gate, ramp, runway, and departure traffic control sequencing capacity.

Situations that reflect negatively on airports—extended tarmac delays,
diversions, chronic taxi queues and schedule delays—are proactively mitigated and managed through surface management solutions, notes Hofsass.

**Multi-faceted Cost Savings**

Surface constraints and bottlenecks are costly in terms of fuel burn, emissions, schedule integrity and passenger satisfaction. In emergency situations, such as severe weather or a safety/security incident, the airport surface requires maximum visibility and status updates from the airport operator to its key stakeholders. The solution FLL has chosen will provide critical situational awareness, visibility, alerts and decision support, says Hofsass. With this new tech tool in its arsenal, the airport can keep all stakeholders aware of the status of the operation and availability of key resources, he explains.

Hofsass notes that at one major U.S. hub, surface metering saved an estimated $11 million in fuel costs, saved 14,800 hours of taxi time and reduced emissions by 48,000 tons.

“The surface metering technology we’re now implementing is one of the tools that will help us reduce the amount of congestion, by allowing aircraft to remain at gates and reduce taxi time to reduce idle time and taxiing,” says Nonnemacher. “Ultimately, it will help us operate more efficiently.”

Currently, gate assignments for arriving and departing aircraft are made and then held based on the scheduled times. But the schedule often changes due to weather, air traffic control instructions and other factors. Static gate plans can quickly become a major constraint and source of inefficiency. The new program being implemented at FLL allows for the fluid assignment of available gates based on real-time demand, priorities, conditions and capacity. It combines predictive analytics—such as highly accurate arrival times and predicted taxi-out times—with continuous updates from key stakeholders.

Bertapelle considers the new system a “very proactive approach” to FLL’s specific constraints and predicts that it will help the airport improve capacity and continue to grow. He is particularly enthused that FLL has pledged to train its own operations people to use the technology rather than relying solely on the airlines. “That’s way ahead of the power curve, and it’s a big step toward better collaboration,” he says.

Hofsass notes that the system allows FLL to manage more demand and growth at the fraction of the cost of capital investments. Adding gates and space takes time, but a collaborative decision-making system allows airports to assess and adjust quickly, he explains.

“Let’s say that an aircraft coming in has 40 hot connections to other flights, cruise ships or other destinations,” Hofsass relates. “The airport now has the ability to flag that as priority and bring it to a gate assignment faster. In the past, they have been able to do that on a case-by-case basis but not on a consistent, systematic basis.”

**The NextGen Factor**

In addition to being a key player and visionary in FLL’s collaborative surface optimization initiative, Bertapelle is also heavily involved with the NextGen rollout processes for JetBlue. Overall, he has been working with the collaborative decision-making processes for 25 years.

The key, he says, is making sure that data exchange is a mutual effort.

The process is part of FAA’s System-Wide Information Management (SWIM) program, which was developed to better manage information over various channels. SWIM also controls the standardization and security of modern data.

“You have to give data to get data; it’s a two-way street,” says Bertapelle. “We measure accuracy of the data, and it’s a fairly intense process. The airports weren’t typically part of that process, outlined by a memorandum of agreement from the FAA. With this, we can share the information across the board.”

PASSUR also operates its own surveillance network, including a proprietary sensor system installed at FLL. This provides additional data resources needed to create predictive analytics for arrivals and departures.

Bertapelle notes that it takes considerable coordination to set up such a system and ensure that all the pieces are working together. “It’s not a tool you buy and it’s done,” he says. “It’s very interconnected and player-dependent.”

“The key to surface optimization is knowing what is [already] on the ground, what order [other aircraft] will be on the ground, and maximizing the gate space,” adds Hofsass. “Our ultimate goal is [to have] no gate conflicts when an aircraft turns onto the apron.”

Nonnemacher is optimistic about how the airport’s new system will support that goal. “It’s a creative alternative to traditional solutions for terminal constraints, and this is definitely the right move,” he says. “At the end of the day, the surface metering will pay for itself multifold and the airlines will benefit. Any tool you can give your air traffic controllers that will enhance capacity and enhance safety is well worth it.”