New data collection technology may help small airports improve operations counts

July 23 2018

A plane flies over the Blueavion f1 data collection technology at the Purdue University Airport. The device uses data collection technology to help small airports improve operations data collection. The technology was developed at Purdue University and is available through Bluemac Analytics. Credit: Darcy Bullock, Purdue University

With just 521 airport traffic control towers in the U.S. and nearly 20,000

U.S. airports, documenting flight operations can be challenging, say airport managers. Costly too, as airports' can receive funding through the FAA's $1 billion-plus Airport Improvement Program, but this funding is highly dependent on documentation of an airport's operations.

Airport operations—the landings and takeoffs of aircraft—are typically logged through traffic control towers, but airports without control towers face greater challenges in collecting such data.

A Purdue University-developed product called Blueavion f1, launched Monday (July 23) by Bluemac Analytics Inc. is shown to help airports more accurately log airport operations. While Purdue University Airport is the second busiest airport in the state of Indiana and open 24 hours a day, Lafayette Air Traffic Control Tower operates only during the busiest hours, a common situation found at many towers. Technology can help the airport more accurately log its flight operations, according to Adam Baxmeyer, manager of Purdue University Airport. Which is one reason why the Purdue University Airport participated in the testing of the Blueavion innovation.

"Our control tower is open 14 hours a day, so that means we have 10 hours a day where we have to find other means to capture operations data," Baxmeyer said. "We have been able to advance our data collection through this new technology and capture data we might otherwise miss."

What Baxmeyer found is that there are many on-demand air cargo operations that use the airport at off-hours in support of local manufacturers.

"We know the Purdue University Airport is used to support many businesses in the Greater Lafayette area. Being part of the field test for the Blueavion f1 technology helped us identify even more accurate operations data during the overnight hours when the local control tower

is not in operation." Baxmeyer said.

Bluemac Analytics is a hardware system, data and analysis company serving transportation agencies around the globe.

"The sky is just going to get more crowded, and we've been looking for something that can help the many smaller airports that need a system to automatically log operations," said Keith Szot, CEO of Bluemac. "What we wanted was something that is cost-effective and can precisely understand how an airport is used. More accurate data also can help airports apply for an FAA Airport Improvement Program grant that can be used for the planning, improvement and development of public-use airports."

According to the FAA, Airport Improvement Program grants are designed for public-use airports that are publicly owned, privately owned but designated by the FAA as a reliever, or privately owned but having scheduled service and at least 2,500 annual enplanements.

The Purdue University Airport participated in the testing of the Blueavion f1 innovation.

"Being part of the field test for the Blueavion f1 technology helped us become even more accurate during the overnight hours when the control tower is not in operation," Baxmeyer said.

The technology, developed by Darcy Bullock, the Lyles Family Professor of Civil Engineering and director of the Joint Transportation Research Program, and John Mott, associate professor in the Purdue Polytechnic Institute School of Aviation and Transportation Technology, features a transponder data collection system that provides a more accurate method to determine the number of operations an airport has in a given time.

"Many small airports rely on approximations for operations counts, but a more accurate method to collect this data could help when applying for FAA funding," Mott said. "What we have developed is a way to utilize the transponder signals broadcast by most aircraft to compute the distances of those aircraft from our portable receiver and data collection device. These distance computations are used along with additional parameters such as aircraft altitude to determine whether an aircraft is taking off or landing at a particular airport. This is an improvement over the conventional method of acoustic counting technology, which typically captures only a portion of total operations.

The Blueavion f1 technology is placed near runways and is able to self-calibrate.

"Any small airport interested in improving its operations counting accuracy can benefit from the technology," Mott said. "More than that, it can be extended to provide improvements in safety and operational efficiency, as well."

Bullock added that, long-term, the technology may help an airport secure more funding for future improvements.

"An important criteria for the FAA is to determine usage and need for the future of an airport, and one of the most important aspects of this is operations," Bullock said. "How many planes use the airport, is usage increasing or decreasing, what does the airport need to maintain its high level of service? For many of the smaller airports it is not unusual for planes to come in and out, and they won't know about it because they can't be managed 24/7. Our goal with this technology is to help these smaller airports."

The Blueavion f1 is licensed through the Purdue Office of Technology Commercialization.

Provided by Purdue University