

The airport is testing a system combining active RFID and Bluetooth technologies to create a detailed flow map of passenger traffic through the terminal, enabling it to reduce delays and improve its layout.

By Brett Neely

May 30, 2008—Today's modern airports are often huge and filled with stores, restaurants and other distractions. But that size frequently means passengers must walk far from a terminal's central area to reach their gates.

At [Copenhagen Airport](#), approximately 4 percent of all flight delays are caused by passengers arriving late at a gate. To alleviate that problem, and to help plan retail strategy, the airport is testing a system combining active RFID and Bluetooth mobile phone technologies to track passengers' locations within the terminal. The system alerts customers via cell phone if it detects them to be far from the gate as their flight begins boarding.



The Gatecaller project uses active 433.92 MHz to track the location of air passengers.

The system, known as Gatecaller, employs credit-card-sized, battery-powered RFID tags transmitting at a frequency of 433.92 MHz, which passengers receive upon checking in, then return upon boarding. Gatecaller is being developed by a consortium that includes [Lyngsoe Systems](#), Copenhagen Airport, the [IT University of Copenhagen](#), [Blip Systems](#) and the [Riso National Laboratory](#).

At present, the consortium is halfway through a three-year project dubbed [SPOPOS](#) (the Danish

acronym for "tracking technology personal and operator services"), to develop and test technology for tracking people and objects. SPOPOS is backed by a \$2.7 million grant from the Danish government.

On May 15, [Scandinavian Airlines](#) (SAS) took part in a successful live trial that involved providing the tags (provided by Lyngsoe) to 106 passengers from one of its flights, then registering their names and cell phone numbers. The consortium installed RFID readers supplied by Lyngsoe, as well as Bluetooth transmitters from Blip Systems, at 25 key "gateway" points throughout the terminal to track passengers passing those locations.

"Overall, for SAS, it's obvious we have to participate in a project that makes travel more efficient and smooth," says Mikkel Londahl, a spokesman for the airline. "We are pretty sure this technology can help us achieve more punctual departures."

According to Henrik Bjorner Soe, the marketing manager at Copenhagen Airport, which initiated the project, the RFID system will reduce stress for passengers and further the airport's goal of being "silent"—that is, without frequent calls for passengers over the public address system. "We have 300 personal calls every day over our loudspeakers calling passengers to the gate," Soe says. "This is because we do not know which passengers are close to the gate and which passengers are far away from the gate."

As a flight prepares to board, the system codes the appropriate passengers with a red, yellow or green designation, based upon their projected walking distance from the gate. On a computerized map, those near the proper gate appear as green dots. Yellow dots indicate passengers who are some distance away, but who will be able to make the flight, so the system calls or sends a text message warning them about the impending takeoff. Red passengers are far enough away that they will not likely be able reach the gate in time to make their flight; if necessary, airline personnel can pull those customers' bags from the aircraft and begin rebooking them.

The system will also enable airports to determine passengers' locations in real time, says project leader John Paulin Hansen of the IT University of Copenhagen, allowing them to adjust staffing levels on the fly. "The airport can increase manning on the security lines," he states, "because they can see people checking in and know that in 15 minutes, those people will be going through security."

Paulin Hansen says the Copenhagen Airport project was the first he was aware of that combined RFID and Bluetooth, and that the two technologies were highly complementary. "We can calibrate the systems [RFID and Bluetooth] against each other," he explains. "Therefore, we have been able to achieve 100 percent accurate tracking of passengers." Passengers with Bluetooth phones can also receive location-based services such as TravelMate, which can provide customized data about their destination.



[Click here to view a larger version of the map.](#)

In addition to cutting delayed flights, the airport can utilize the passenger data to analyze the flow of travelers throughout the facility, as well as to shape its strategy for placing restaurants and stores along the terminal. "There's a lot of opportunities to look at, How long do people stay in certain areas? How long do they stay in the shop, and how much are they spending?" says Copenhagen Airport's Soe.

The software behind the Gatecaller system is based on a database created by Lyngsoe and further developed by the IT University of Copenhagen, and it has a Web-based interface enabling users to follow passengers' whereabouts in real time. To assuage privacy concerns, the current demonstrations operate on an opt-in basis. What's more, although the system currently reveals a passenger's location only within an area 100 by 100 meters in size, Paulin Hansen claims greater precision is possible.

According to surveys conducted by Copenhagen Airport, passengers are interested in having access to online updates in order to track family members, such as children traveling alone or elderly parents. "Passengers believe that if it can help them, they have no issue with the technology," says Jan Poulsen, a sales manager with Lyngsoe, which has already developed RFID-based baggage-handling systems for airports in Hong Kong and Milan (see [Milan's Malpensa Airport Prepares for RFID Baggage Handling](#)).

Although the Gatecaller project is currently in a demonstration phase, Paulin Hansen expects versions

of the system to eventually be implemented at Copenhagen and other airports. "Every medium and large airport would like to have a system like this one," he states. "If we can document the effect of being able to cut down the number of delayed flights, or we can have passengers paying for this service, then I think we have a very interesting business model."