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Gatwick Airport's Six Sigma team tells *PTW* how it has used simulation software to boost capacity and improve the passenger experience without significant investment

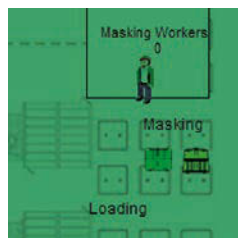
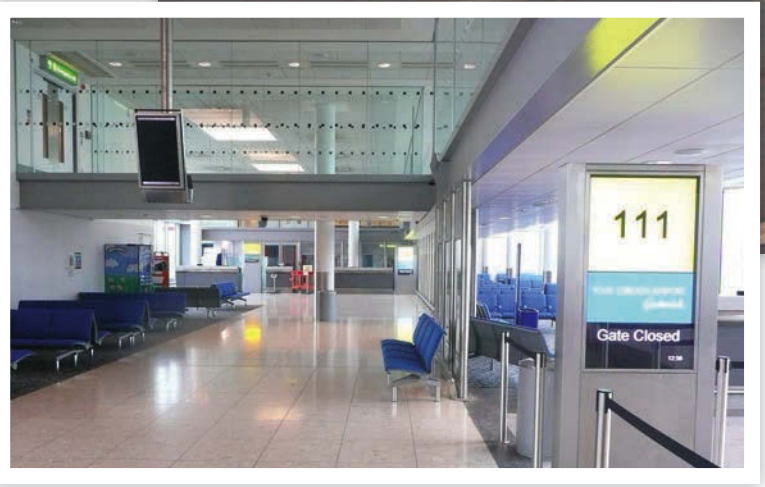
■ In March 2013, Gatwick Airport officially opened its new  
■ £6.4m pier-served A380 stand. To celebrate, Emirates operated one of its A380 aircraft into Gatwick, giving stand 110 on pier 6 the final stamp of approval. The investment into the stand was made as the airport continues to focus on making the most of its available capacity.

Gatwick, which currently welcomes 34 million passengers a year, has around 25% spare capacity and is forecast to grow its passenger numbers to around 38 million by 2020. As the world's busiest single-use runway, increasing passenger numbers on board flights is a key element of the airport achieving its targets for growth.

For the terminal itself, changes were needed to the boarding gate rooms to ensure they could cope with the increased passenger numbers of the A380. This is where the Simul8 simulation-modelling tool was used to great effect.

Chris Baldwin, Six Sigma change manager at Gatwick, says, "We used the Simul8 tool to help us design the A380 stand and its gate rooms. Previously, we didn't have the facilities to serve the large aircraft due to its size and weight, and the amount of air bridges it required."

For the gate room, he explains, the Six Sigma team was tasked with looking at the different options available. "We had two options: first, to build something completely new, which would require significant investment; and second, to improve an area that we already have. We chose the latter and used Simul8 to help design the size of the gate room that we required. Setting up for a A380, we had to go from processing about 300 passengers to around 500," Baldwin says.



ABOVE: The gate room at London Gatwick Airport can be adapted for A380 flights  
RIGHT: Screenshot of the Simul8 simulation software

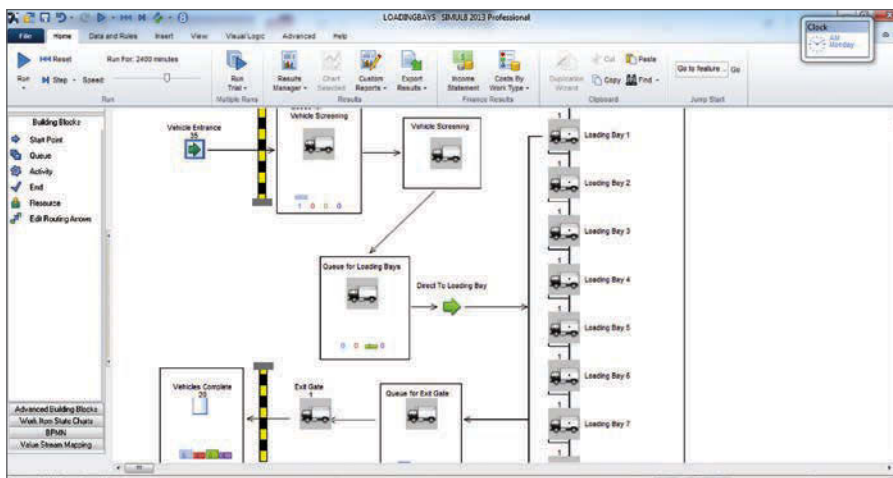
In March, Emirates' A380 was the first aircraft to use London Gatwick's new pier-served A380 stand



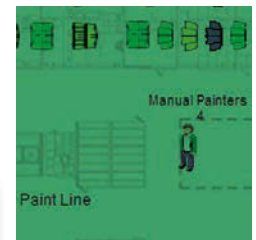
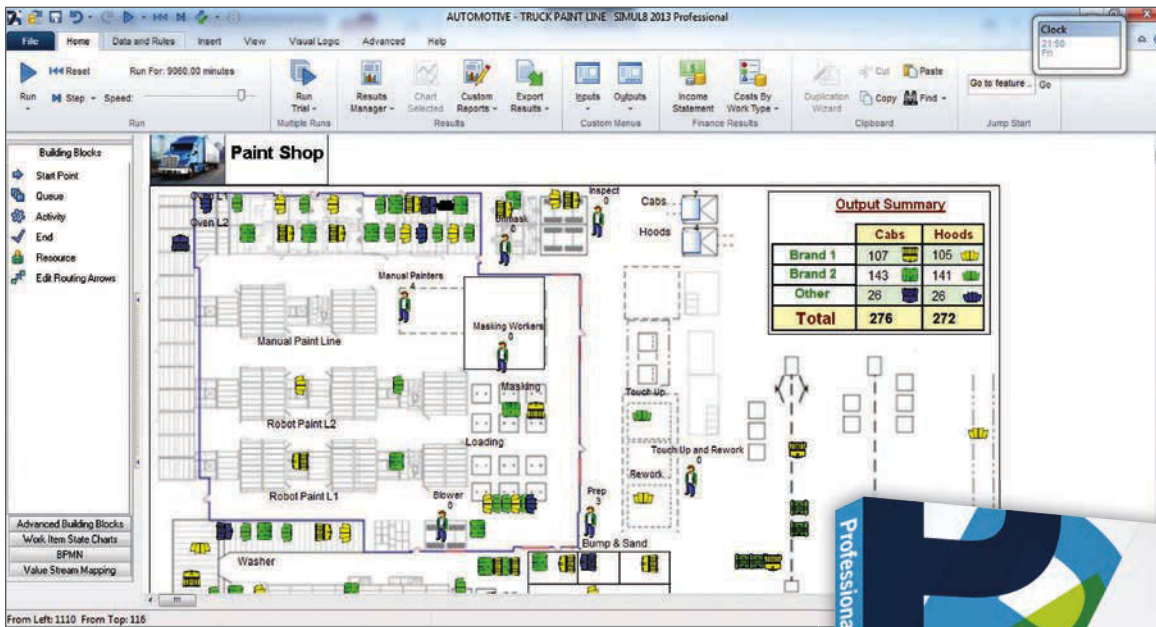
The aim was to use existing infrastructure more smartly to avoid large investments in building new gate rooms. “We didn’t want to keep ploughing money into building the airport bigger and bigger when we could utilise the space we already had,” explains Baldwin.

The first stage in the process was to gather all the data that was needed to run different passenger arrival scenarios in the Simul8 tool. For this, and for other projects being undertaken at the airport, Gatwick decided to carry out an extensive passenger profiling survey whereby staff monitored about 50 flights and recorded the response times of passengers – from when their gate number is announced to the time they get to the gate. “This was a manual process to enable us to gather all the baseline data that was needed for simulation,” Baldwin adds.

This data was fed into Simul8 and gave the airport a good overview of passenger behaviour. Simul8 was then used to run seven different scenarios of how the gate room could operate depending on the number of processing desks, the size of the room and the number of seats.







Simulation software has enabled Gatwick Airport to advise airlines on how to make operations more efficient

“That led us to realise that with some modifications we can use existing gate rooms to process A380 flights,” explains Baldwin. “We also now know how to best regulate when people turn up at the gate and therefore how many people can fit into the gate room to ensure we avoid overcrowding.”

Highlighting one of the main benefits of using simulation for this process, Michael Goacher, airfield performance programme manager, says, “If we were to run those scenarios in real life, we would have greatly impacted the passengers, the handling agents and the airlines. It would be quite disruptive. Using simulation, we ran the seven scenarios in about one hour and came up with the optimal solution in a couple of hours.”

For A380 flights, Gatwick can now use two existing gate rooms working together. The physical footprint of the rooms has remained the same and more desks have been added. Using Simul8, Gatwick has also been able to create a ‘premium boarding point’ for first-class travellers on the A380.

“Premium passengers have a different arrival profile,” says Baldwin. “They probably won’t go down to the gate room as soon as their flight is called because they will be in a lounge – therefore they arrive later on in the boarding process. The last thing they want to do is turn up as a first-class passenger and stand in a queue of economy passengers. The premium boarding point offers them a ‘fast pass’ to the aircraft.”

Using the scenarios created through simulation, Gatwick is currently working with one of its major A380 airlines to design a bespoke process for them when using the gate. Simulation is also being used to show other airlines how Gatwick is set up to cope with the A380.

“Using simulation enables the airlines to picture and have a say in each of the possible scenarios in the gate room. The seven scenarios we ran enabled us to pick the right solution for the right airline to ensure passenger experience remained high,” adds Baldwin. “Our research has told us what time passengers would like to reach a gate room, and so we have used Simul8

Using simulation enables the airlines to picture and have a say in each of the possible scenarios in the gate room

to see if we can meet that need. This means that passengers aren’t hemmed into a gate room for long periods of time.”

The Emirates A380 that landed as part of the official opening of the new stand in March had a full passenger load. Gatwick’s Six Sigma team monitored this flight and its passengers, and according to Baldwin, “this validated all the figures that Simul8 has previously given us”.

Gatwick now has a set of figures from the simulation scenarios that will enable it to determine the optimal boarding process and situations for future A380 and other flights. (The A380 gate is flexible so it can cater for other types of aircraft landing at Gatwick.)

“This process has given us a table of figures that illustrate different times for boarding,” says Goacher. “For example, the tables enable us to see how many people would be in a gate room if we called a flight at 75 minutes from departure, used three desks and started boarding at 35 minutes before departure. It gave us a grid that is easy to communicate back to the airlines to show them which is the optimum process for boarding for different flights, and means the airlines and handling agents are well aware of the consequences of not boarding on time.” ■