MassMotion

Case Study

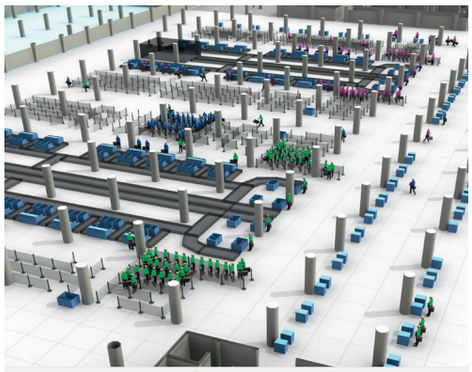
Pedestrian Simulation

Airport Planning - JetBlue T5 JFK, New York

With the high volume of passengers moving through terminals each day, it is vital that airports are efficiently designed to guarantee a safe and seamless journey. With numerous flights arriving and departing on an hourly basis, our crowd simulation software enables designers to test ideas quickly and accurately, with the results presented in a clear 3D format.

The JetBlue Terminal at New York's JFK International Airport is a model of passenger comfort and efficiency, thanks to MassMotion. During the design phase JetBlue was particularly concerned about the quality of movement and amenity within the central concessions area of the design. Although Arup had already run process simulations of the airline operations, these models did not provide the level of detail necessary to judge the likely success of the central concessions area.

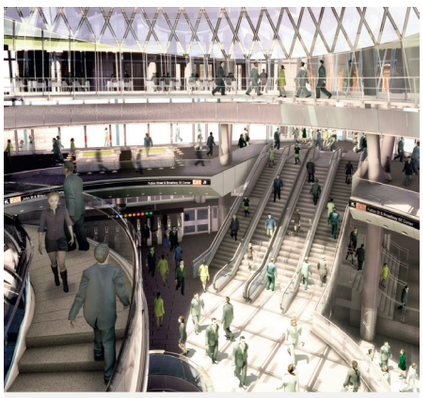
MassMotion was used to conduct a detailed study of the passenger movements to and from the gates as well as the utilization of dining and retail space. Our model simulated a full day of activity to ensure that at no time did the comfort and fluidity of passenger movements fall below JetBlue's high standards. In particular we were able to help JetBlue demonstrate to the Port Authority of New York & New Jersey that their new terminal design would be an ongoing success in terms of passenger satisfaction, and therefore gained approval to move forward.



MassMotion is used in major airport redevelopments, during the design phase of new buildings or during continual upgrades to manage passenger demands.

Rail Solutions - Fulton Center, New York & Union Station, Toronto

For the design of new stations or renovation of others, it is vital that passenger safety is prioritised. For new projects, designers can test a range of passenger routes within the proposed station and our BIM-compliant software will provide 3D, gaming quality results.



During refurbishment of any rail project, MassMotion can be used to predict passenger movement based on increased demand or platform closures.

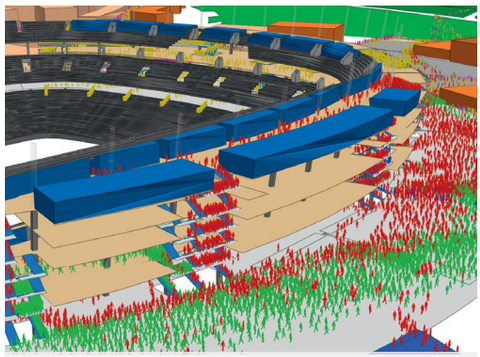
Engineered by Arup as prime project consultants, New York's newest transport hub, the Fulton Center is ready to serve up to 300,000 passengers a day in post-9/11 Lower Manhattan. The design team needed to understand how people would move through the station and resolve any potential conflicts before finalising plans for the US$1.4bn project. "With any transit project, there is a lot of competition for a limited amount of space," says Eric Rivers, a pedestrian planner with Arup. Subway platforms, for instance, are used as corridors as well as for boarding, alighting, and waiting for trains. "The only way to understand it was with a micro-simulation model," he says.

In 2004, Arup was awarded the contract to assess the pedestrian flows through Canada's busiest transport facility, Union Station, during the refurbishment and for the predicted conditions of 2021. The study revealed a number of opportunities and constraints for the refurbishment, and informed the best locations of the retail, commercial and transit-related facilities. The modelling analysed the 2021 predicted passenger flows, and also checked each stage of the refurbishment to ensure that the station would continue to function while the rebuilding work closed off parts of the concourses.

Stadium Planning

Oasys' crowd simulation software allows those involved with stadium design to accurately simulate and analyse crowds to achieve the highest levels of safety. Whether it be designing a new stadium or developing areas of existing stadia, our software will continue to be used around the world to provide information on potential safety issues and allow users to test a range of solutions.

When working on a football stadium, a venue which sees tens of thousands of people enter and leave in a relatively short period of time, any redevelopment measures must be carried out with no disruption caused to safe access and egress. MassMotion has been used during the redevelopment phase of some of the world's best-known sporting venues, to ensure that building efficiency and passenger safety remain a paramount concern.



Monitor crowd behaviour at peak times during sporting events or ensure maximum levels of safety for evacuation planning.

Fire Safety & Evacuation - Royal Chapel, Dublin Castle

Test designs to find the most effecient way of evacuation.

For exhibition venues, office buildings and major sporting or musical events, our crowd simulation software is used to test scenarios when emergency evacuation is required. Our crowd simulation software will inform users of potential congestion, bottlenecks and blocked routes in an emergency situation. Planners are able to test, analyse and test again until the desired outcome has been achieved.

MassMotion was also used for a fire safety risk assessment of Dublin Castle, the main aims of which were to identify any fire safety deficiencies. The grounds of the historic Irish castle contain many buildings of architectural and historical importance, each of which formed part of the fire safety risk assessment.

One particular building, the Royal Chapel, built in 1814 and now mainly used for functions such as choir performances came under additional attention. Due to the narrow and irregular step heights, it was not possible to assess the escape capacity of the chapel stairs against any current fire safety guidance. It was therefore necessary to assess this existing situation using a first principles approach. MassMotion was used to determine if the estimated occupancy could still escape within an acceptable time, to determine the suitability of the existing stairs.

Results from the MassMotion model were compared against a nominal time, and it was found that all occupants could indeed enter the protected area within the stipulated time. It demonstrated that while the existing stair arrangement is irregular and narrow, there is sufficient escape capacity to accommodate expected occupants, provided that there are no health and safety restrictions.

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