

MassMotion and Flow are the next generation of advanced software for simulating pedestrians and analysing crowds.

**It is used by engineers, designers & planners worldwide to predict the movement of hundreds of thousands of individual personalities in a complex 3D environment.**

Our leading technology provides users with clear information about crowding, usage patterns and occupant safety in a facility. This predictive power enables positive decisions to be made early in the design process with minimum cost and disruption. As designs evolve or issues arise, the software can quickly and accurately test numerous layouts and various scenarios until the required design has been identified.



Using this advanced modelling software is a cost effective solution to visualize a range of real life scenarios, to manage the risks and improve the customer experience. MassMotion and Flow have roles to play on the drawing board, during construction and then as a management tool throughout the life span of any building and surrounding areas.

## Analysis

Once the simulation is completed you can analyse how long it took people to get from one point to another and identify flow rates for doors, stairs and escalators in any environment you choose to simulate. It will even help you understand what people can see as they move through a space.

## Features

MassMotion and Flow boast an impressive array of built-in graphing, mapping and filtering tools allowing users to quickly and effectively look into results, and make better-informed design decisions.



They are subject to continuous development and the current release can import an array of file formats including IFC-converted AutoCAD, MicroStation, SketchUp, Rhino or Revit model, amongst others, and then run simulations of different scenarios within the BIM named circulation events – typically delivering results in minutes. Both tools also have their own powerful built-in 3D modelling capabilities, meaning environments can be created from scratch without the need for imports from BIM programs. ‘Bi-ped Agents’ within the software carry out various tasks and move to certain areas within the model, mirroring real-life behaviours.

## Software comparison

	Flow	MassMotion
CAD/BIM Import (.3ds, .fbx, .dae, .ifc, .3ds)	✓	✓
Polygon Modelling Tools	✓	✓
Agent Scheduling (journeys, circulate, evacuate, vehicles)	✓	✓
Powerful Analysis Tools	✓	✓
Open Database Format for Results	✓	✓
Unlimited Crowd Size in Simulations	✓	✓
Advanced Agent Scheduling with Timetables		✓
Process Simulation Tools		✓
MassMotion Dynamics (Actions & Events)		✓

So what projects call out loudest for MassMotion? Transport hubs, including airport and rail terminals, district modelling and fire and evacuation planning form the core user base; usually because of the advanced agent scheduling required for these buildings, where hundreds of thousands of passengers are moving through terminals at very precise times. MassMotion enables designers to program individual agents as personalities with unique agendas such as checking in, going to a platform or grabbing a bite to eat.

With its focus on ingress and egress planning, BIM is very much at the heart of the design of Flow. It goes without saying that this software can prove invaluable for fire engineers, architects, planners and others dealing with health & safety; but commercial managers also have a keen interest in seeing how a building will function.

Verified in accordance with International Maritime Organisation (IMO) and the National Institute of Standards (NIST)



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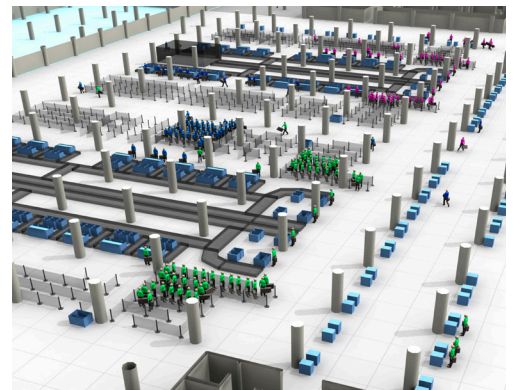


Pedestrian Simulation Case Studies

 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.

 Rail Solutions - Fulton Center, New York

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 results.

Engineered by Arup as prime project consultants, New York's transport hub, the Fulton Center is ready to serve up to 300,000 passengers a day in 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.



MassMotion understands how occupants will behave when faced with, for instance, a choice between a crowded escalator and a relatively empty set of steps. It will even taking into account cultural differences such as giving way to the left or right, the difference in pace length of a man and a woman; or doing value assessment of retail spaces or advertising potential of certain surfaces within the 3D Model.

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