

HOK benefits from BIM integration of pedestrian simulation

HOK is a global design, architectural, engineering and planning firm with 1,800 employees collaborating across a network of 24 offices. To create exceptional environments that meet clients' complex design challenges, the firm relies on the most advanced software. In 2009, HOK was making a strategic move towards 3D design, and needed to replace the modelling tool it was using to generate 2D CAD data with resultant loss of vital data.

So, in 2011, HOK became one of the first commercial users of 3D MassMotion. Since then, the firm has worked closely and directly with the Oasys development team in Toronto to develop and improve the software. It was agreed that adding IFC (Industry Foundation Classes) import would be beneficial for a 3D pedestrian modelling tool, and an open source tool kit was used to enable reading IFC data into various visualisation tools.

Greg Schleusner, Director of Design Technologies at HOK, identified components that did not exist in traditional BIM files that mapped to simulation objects; and MassMotion's crowd simulation development team in Toronto, led by Erin Morrow, developed workflows to automatically extract this simulation geometry. At the time MassMotion relied on Autodesk's Softimage platform for modelling such as floor objects, doors, stairs, escalators and more could be matched and linked from Revit and other modelling tools.

This was never envisaged as the long-term solution and Oasys started to develop its own graphical front end, to provide greater flexibility and offer more dedicated tools for the development of crowd simulation environments. The new graphical environment fronts up both MassMotion 8.0, the latest MassMotion build, and Oasys' new variant Flow launched in 2015 for quick modelling to get feedback on pedestrian interaction and behaviour in different scenarios.

HOK is already experiencing the benefits of using Flow, and was one of the original beta-testers of MassMotion 8.0. "We previously used a filtered Revit export before importing into MassMotion," said Greg. "But with the new version's modelling platform, importing geometry saves time and effort. We haven't identified our preferred final workflow, but everything we've tried has worked."

The software has been used for HOK projects including office buildings, airports, stadiums and large-scale planning projects. Models are produced in Revit and imported into MassMotion and Flow using the IFC data format, and the geometry is automatically mapped. This saves a tremendous amount of time as MassMotion automatically identifies links and portals from Revit, eliminating the need for users to manually create them. The learning curve for using MassMotion is significantly reduced by IFC compatibility, meaning users can spend more time analysing and testing designs and less time linking geometry.

With these enhanced BIM capabilities, HOK can use MassMotion for more than just validation. Though MassMotion will primarily be an analytical tool providing vital information on how pedestrians interact within environments, it can do more. Simulations are quick, easy and with the range of 3D graphical outputs, MassMotion also acts as a design tool. It's scalable options enable designs to be presented to clients with real-time pedestrian interaction.

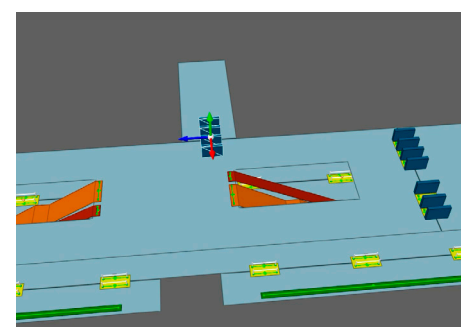
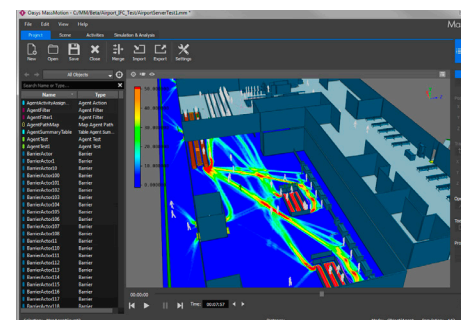


Image credits

Banner: Example of an imported model into MassMotion
Top; Example of an imported Revit model in MassMotion
Bottom; MassMotion automatically identifies links and portals