



Royal HaskoningDHV use Oasys MassMotion on Merseyrail projects

Merseyrail pre-empts problems of growing passenger numbers with state of the art crowd analyses

Merseyrail is both a train operating company and an urban network of vital importance to the transport infrastructure of Liverpool and its surrounding areas. It is one of the most punctual and reliable railway networks in the UK, with consistently high scores for customer satisfaction. Merseyrail is keen to ensure that it can handle growing volumes of passengers safely and efficiently.

Merseyrail runs around 800 trains and carries over 110,000 passengers on an average weekday. There are 66 stations on its network, four of which are underground in Liverpool's city centre. With their fleet modernisation project expected to be completed early in the next decade, Merseyrail wants to nip congestion problems in the bud by making pre-emptive changes to its stations.

Working with Royal HaskoningDHV and using Oasys MassMotion, Merseyrail aims to deliver both maximum return on their investment and maximum customer satisfaction.

Royal HaskoningDHV's analysis focussed on two of the city's busiest underground stations: Liverpool Central and Moorfields. Using Oasys MassMotion, they predicted passenger flows and pinpointed congestion bottlenecks. The results will help to optimise passenger use of the updated railway stations, as well as improve overall safety and the customer experience.

After inputting train schedules, distributions, and the expected number of passengers into Oasys MassMotion, Royal HaskoningDHV modelled the arrival and behaviour of passengers on each platform and followed them through the stations as they used lifts, stairs, and escalators. If required, Oasys MassMotion can ask the simulated passengers to stop to buy a newspaper or coffee, or wait in front of information boards. The analyses also used the predicted increased passenger numbers to align any recommendations with future needs.

Janet Ives, Head of Safety at Merseyrail commented: "Over the years, the demographics of our passengers have changed considerably, and this has had a huge impact on passenger flow and behaviour. The simulations being developed by Royal HaskoningDHV will help us to visualise the impact of these changes, optimise station capacity, improve safety, and eliminate bottlenecks throughout the station."

Of course, the animations that Merseyrail managers will see are only the tip of the Oasys MassMotion iceberg. To generate them, the Royal HaskoningDHV team used information on the passengers' changing demographics and populated its models with 'agents', virtual passengers with individual agendas to catch trains or reach exits.

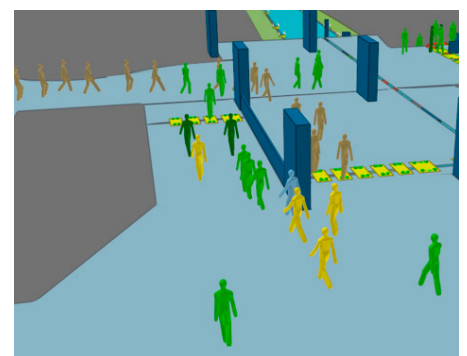
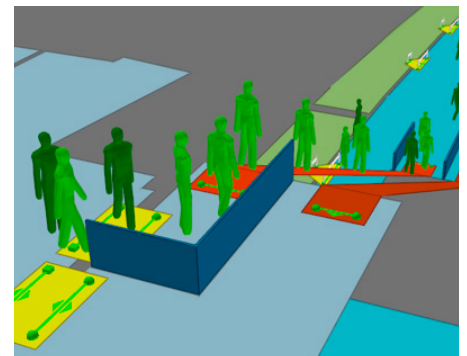
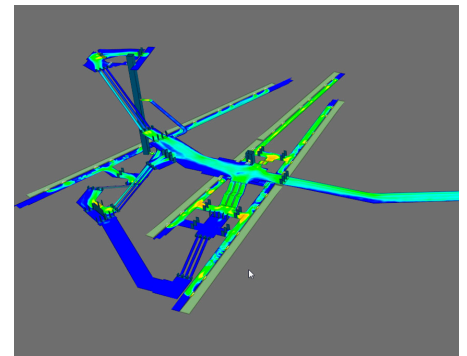
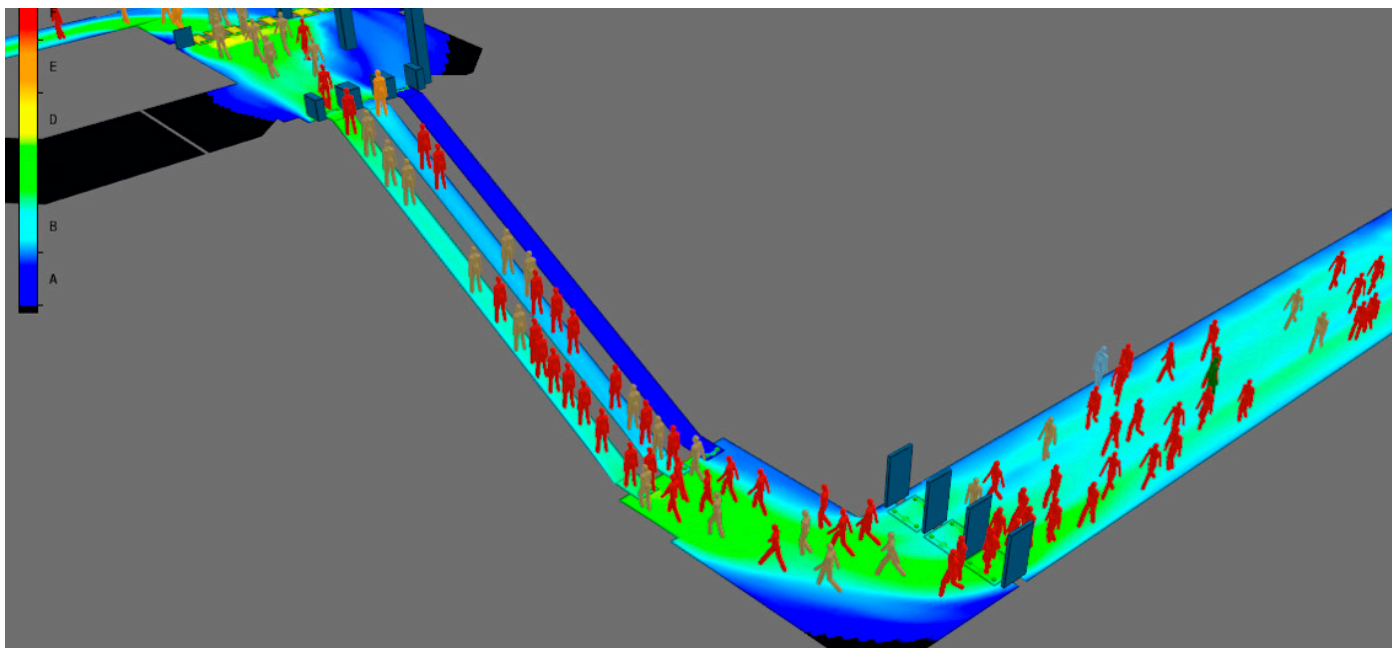


Image credits

Banner: Liverpool Moorfields rush hour travellers.

Top: A model of Liverpool Moorfields imported into Oasys MassMotion showing pedestrian flow.

Middle & bottom: Oasys MassMotion agents realistically navigate the model station.



When Royal HaskoningDHV originally chose Oasys MassMotion for its pedestrian simulation and crowd analysis work, it did so after extensive testing so that they could be confident that the results produced by an Oasys MassMotion model would match real life observations. They concluded that Oasys MassMotion was as near to real life as it was possible to get.

Above image; Model of Liverpool Moorfields imported into Oasys MassMotion showing agents and the calculated pedestrian density through colours.

Samir el Gamal, business development director for transport hubs at Royal HaskoningDHV said: "Transport hubs are becoming busier and many stations were originally designed to cope with much smaller passenger numbers. We can identify problem areas and demonstrate on screen how modifications such as changing passenger routing or re-configuring ticket gatelines will work."

Quickly and easily, Oasys MassMotion can test the station design solutions to see which will give the greatest improvement. Based on the findings of its passenger flow analyses, Royal HaskoningDHV identified opportunities in three main areas:

- changes to the design of the station and the train schedule;
- influencing the behaviour of the passengers; and
- altering the deployment of station staff.

"Collecting good, reliable, and actionable information on actual station usage will increasingly become essential for Station Managers, both for real time crowd control and for future planning," commented Erin Morrow, Product Director for Oasys MassMotion. "It is also increasingly common for pedestrian simulation to form part of the master planning stage for any project. Oasys MassMotion cut its teeth on major city district redevelopments like Toronto Union Station and New York's Fulton Centre, but is now being licensed by engineers working on schemes of all sizes."

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