



SMART
Simple innovative solutions
to complex engineering problems

SMART Move

People Movement Modelling

People movement modelling helps architects, developers, fire/security advisors and their clients to answer two very fundamental questions about the design of routes and spaces:

1. How do people move and interact in open and closed spaces?
2. How can we design spaces to maximise its use and enhance user experience?

This is achieved by capturing, analysing, and modelling building user movement patterns, and then mapping the conclusions onto the spatial layout, so as to optimise design and management strategies.

Buro Happold's SMART team has developed major expertise and sophisticated people flow modelling techniques through years of experience on the work on several landmark buildings and projects, including: Ascot Racecourse Redevelopment, London 2012 Media Centre, Liverpool King's Waterfront development, Jeddah Airport Hajj Terminal (Saudi Arabia), etc.

SMART Move is a network based micro-simulation software that allows detailed simulation of people movement through a given space. The software is highly scalable and capable of analysis as well as design optimisation of circulation routes through an office floor, school, high rise building, sport stadia and urban spaces alike. The software's network analysis capability is used for conceptual design and analyses of spaces, while the dynamic simulation capability allows testing of complex interaction of hundreds of thousands of people in scenarios such as day-to-day circulation, mass arrival/exodus, and emergency evacuations.

SMART Move's statistical modelling, sensitivity analysis, and design optimisation capability enables various design variables and management measures to be tested thoroughly to achieve the desired levels of comfort and safety criteria, while minimising cost.

SMART Move capability is complemented by the team's powerful data capturing and analysis methodology for the understanding of population behaviours and movement patterns. We have developed EventCounter software that allows rapid analysis of video data to generate statistical information on walking speeds, queuing behaviour, service times, limiting flow rates, etc. This data can be superimposed on a circulation network to obtain visual flow paths and congestion map.



Ascot racecourse simulation



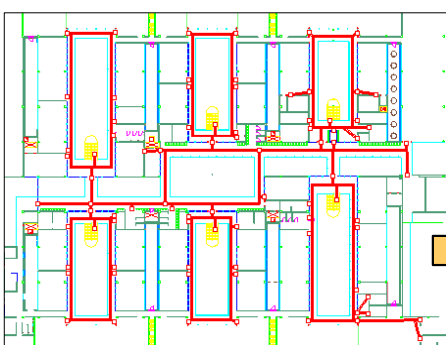
Arrival simulation for London City Airport



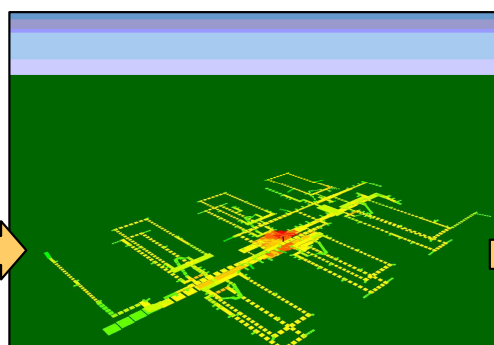
Lord's Cricket Ground exit simulation



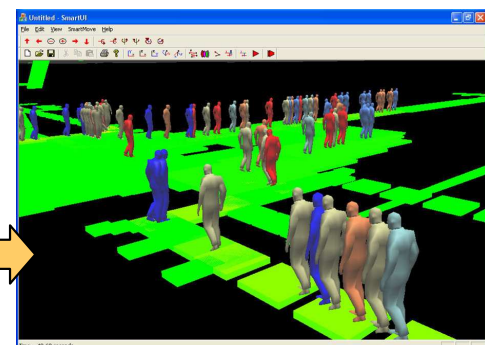
Crowd-traffic simulation – Hotel America car-park



Network model of circulation space



Network analysis: congestion map



Dynamic simulation in SMART Move

<http://smart.burohappold.com>