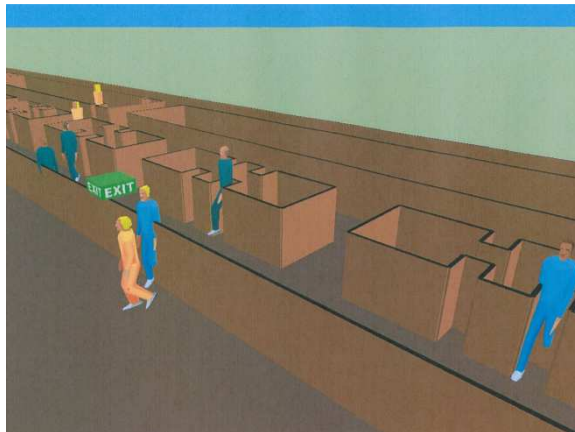
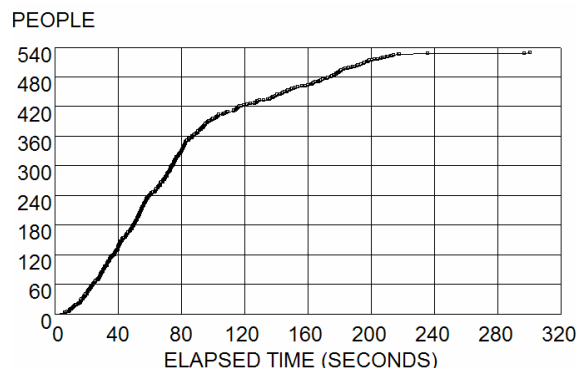


CFD Simulation, CO-concentration



Tunnel users leaving their vehicles



Escape graph

## Description

The Dublin Port Tunnel is characterized by the following data:

- Dual tube with unidirectional traffic
- Tunnel length of 4'500 m
- Gradient variable from -4% to +4%
- 19 cross passages between tubes
- Longitudinal ventilation with 16 jet fans per tube for flow control during fire

The Dublin Port Tunnel is part of the M50 motorway and is a dedicated route for Heavy Good Vehicles between the port and the greater road network. It opened to traffic in 2006.

## Services

HBI Haerter Consulting Engineers provided the preliminary and the detailed ventilation design. This included:

CFD Checking on ventilation design:

- Fire Scenario 100 MW
- fluid traffic
- Longitudinal velocities varied
- Investigation of backlayering lengths
- Critical velocity determined (design confirmed)

CFD and Egress Modelling for evaluation of operational strategy of tunnel ventilation in case of fire during traffic congestion:

- Fire Scenario 30 MW, congested traffic
- Modelling of cars and HGV's
- Longitudinal velocities 0.5 m/s, 1.0 m/s, 1.5 m/s and 2.5 m/s
- Uphill and downhill gradients (-4% and +4%)
- CFD calculations output: velocity, temperature and smoke distribution, concentration of toxic elements
- CFD results input for egress modelling
- Exposure to convective and radiative heat, as well as exposure to CO included in egress model
- Obscuration by smoke included in egress model