IDA Tunnel

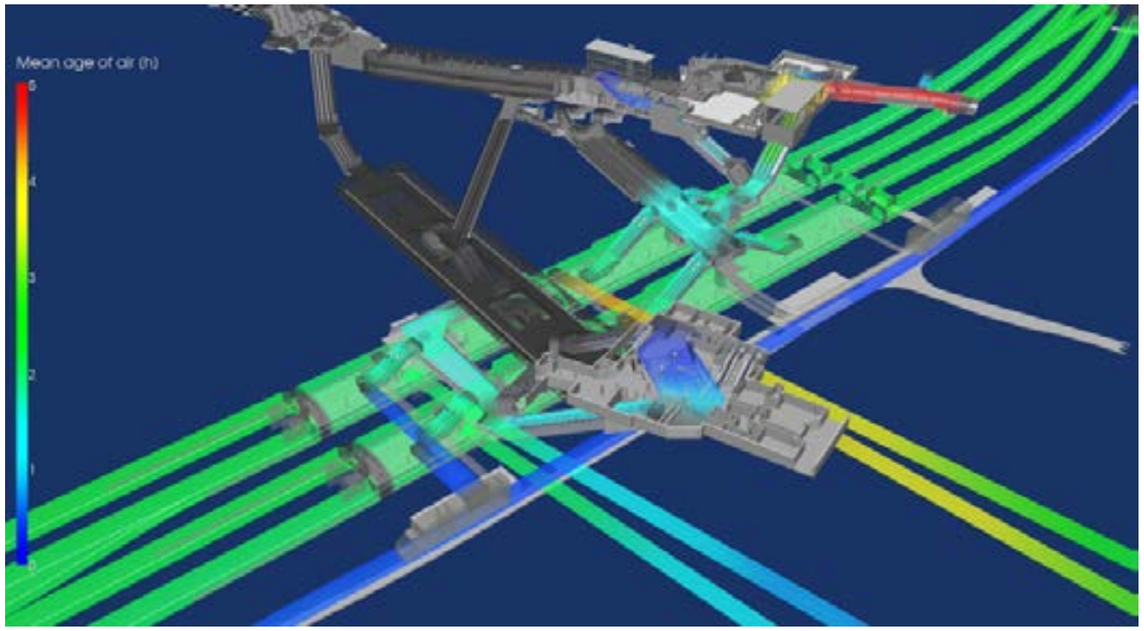
A modern tunnel systems simulation tool

EQUA.

IDA Tunnel

A new generation tunnel ventilation and fire simulation software

IDA Tunnel is an easy-to-use tool for predicting temperature and other environmental variables in tunnel systems under normal and fire conditions. It is used in projects around the world for metro, road, and utility tunnels.



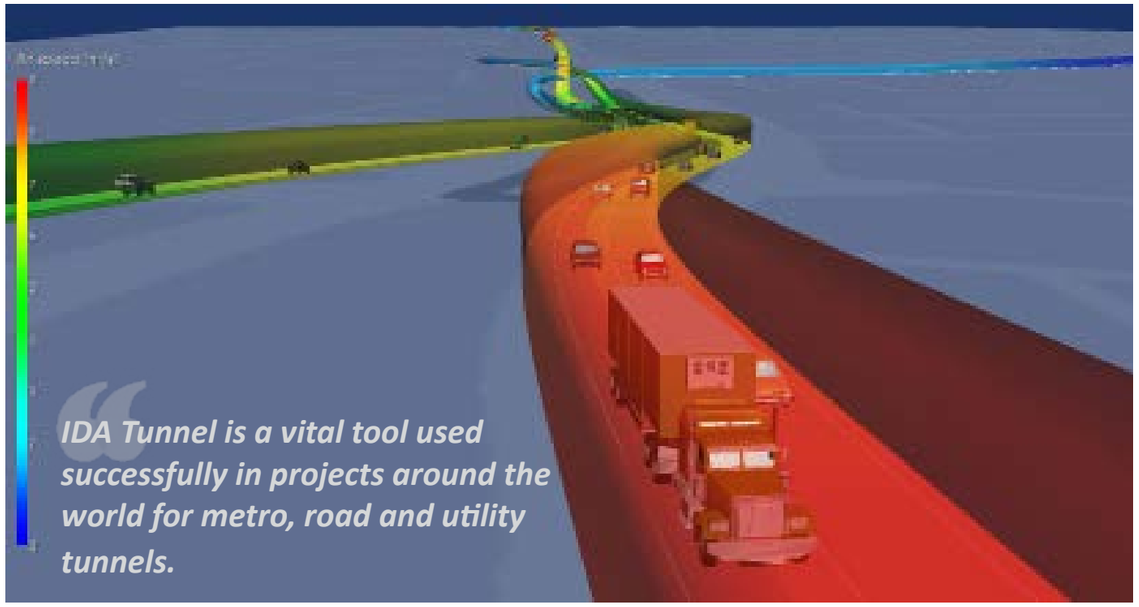
Rail tunnel simulations

IDA Tunnel allows for simulation and accurate prediction of the main climate and safety issues in underground railway systems such as metro tunnel systems. Realistic boundary conditions, including train movements and measured climatic data, can be specified to model air movement and air properties such as particle concentration and temperature.

The final cost and performance of HVAC and fire ventilation systems in tunnels can often be an unwelcome surprise to project owners. Dealing with unexpected physical phenomena after opening inevitably leads to unwelcome additional costs. There is much to be gained by having access to models that can reliably predict the tunnel's way of operation already at the design stage.

Examples of typical IDA Tunnel studies

- Fire studies and smoke ventilation design.
- Finding extreme temperature conditions in tunnels and platforms.
- Jet fan sizing, placement, and control.
- Sizing of cooling and ventilation equipment.
- Computation of boundary conditions for more detailed 3D CFD studies of smoke and air movements on platforms and ticket halls.
- Air quality in tunnels with combustion driven vehicles.
- Particle levels in metro systems due to train traffic.

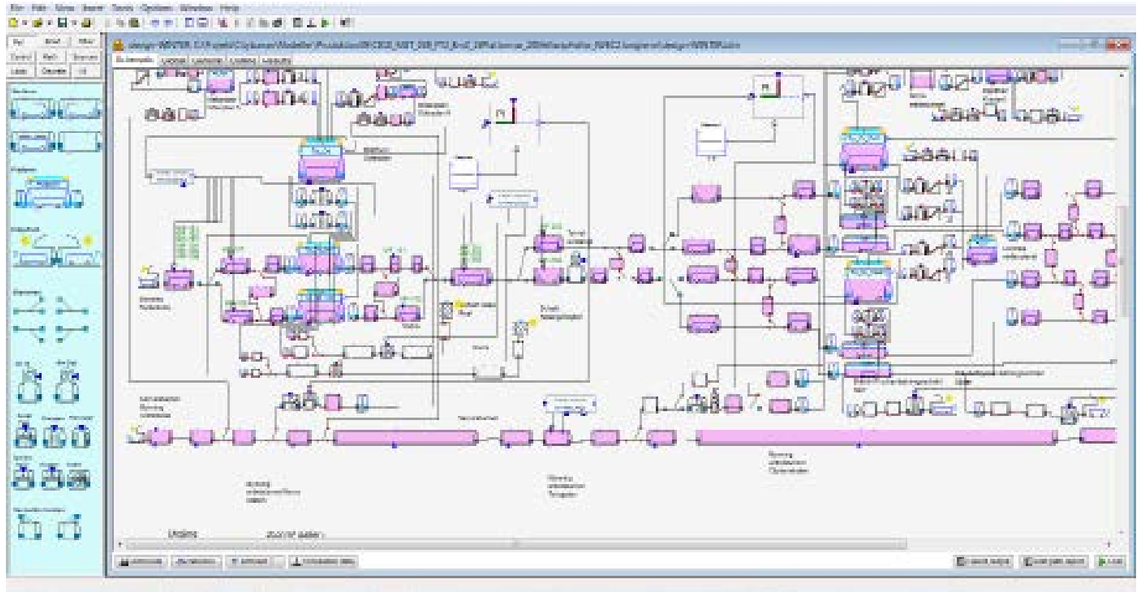


"IDA Tunnel is a vital tool used successfully in projects around the world for metro, road and utility tunnels.

Road tunnel simulations

IDA Tunnel effectively handles air flows in road tunnels and related pollution concentration issues due to vehicle emissions. Realistic traffic models include bi-directional, multi-lane as well as dynamically congested road traffic. Both normal operation and tunnel fire scenarios can be simulated. Ventilation may be longitudinal or transversal, with air supply and exhaust terminal devices distributed along the tunnel.

Accurate computation of ventilation capacity requirements can help prevent an over-dimensioning of equipment such as jet fans and air-exhaust stations. A wide selection of feedback control components allows for an optimization of the ventilation system operation concept, which can significantly contribute to reducing costs in the operation phase.



IDA Tunnel features and modules

	IDA Tunnel	+ IDA HIL Console	IDA Road Tunnel Ventilation	+ IDA Control Toolbox	+ IDA 3D Tunnel Editor
Bi-directional, multi-lane, dynamically congested road traffic	■		■		
1D prediction of air-flow, pressure, temperature, CO, NO_2, and smoke	■		■		
Fire and critical velocity	■		■		
Longitudinal ventilation with jet fans	■		■		
Transversal ventilation	■		■		
Air-in and air-out stations, axial fans	■		■		
Saccardo nozzles	■		■		
Wall temperature profile (heat sink)	■		■		
PIARC emission tables	■		■		
Arbitrarily complex tunnel systems	■		■		
3D plots (value vs. time and path length)	■		■		
80+ feedback control components	■			■	
3D tunnel system editor with traffic lanes	■				■
3D animation of traffic flows	■				■
3D animation of computed results	■				■
3D tunnel system editor with rail lines	■				
Discrete vehicle electric and diesel rail traffic	■				
Variable train headways and stochastic traffic patterns	■				
1D prediction of moisture, CO_2, age of air, HC and PM10	■				
Long-term temperatures, incl. radial water seepage	■				
Tunnel-to-ground and tunnel-to-tunnel thermal coupling	■				
Ice and mould (mildew) build-up	■				
Realistic schedules and measured climate files	■				
Library of HVAC components	■				
Platform passenger comfort (PPD)	■				
Import and SI conversion of SES input files	■				
Hardware-in-the-loop (HIL), real-time console		■			
OPC client for PLC communication		■			
Operator training simulator toolkit		■			
Parametric Runs	■				
Graphical Scripting	■				

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