

Tunnel and Transit Station Capabilities

FRA staff has extensive experience in fire and life safety for road, rail, amusement, and utility tunnels as well as transit hubs. We provide all required services per NFPA 130 and 502 as well as international standards including:

- ◆ Tunnel & Transit Station Smoke Control System Design and Smoke Movement Modeling
- ◆ Egress Analysis and Design of Passenger Flow Systems
- ◆ Fire Detection and Suppression Design
- ◆ Testing and Commissioning
- ◆ Design Fire Analysis and Heat Release Rate Modeling
- ◆ Vehicle and Railcar Radiant Heat Transfer Analysis
- ◆ Mass Notification and Emergency Communication
- ◆ Analysis of Utility Tunnels
- ◆ Emergency Response Plan Development and Training
- ◆ Fire Protection Master Planning
- ◆ Ventilation and CFD Modeling
- ◆ Risk Assessment and Hazard Analysis
- ◆ Specialty Amusement Ride Tunnel Smoke Control Modeling and Egress Analysis



FIRE & RISK ALLIANCE

About Us

Fire & Risk Alliance is a leader in fire and risk engineering. Our staff is composed of highly trained and educated engineers and scientists that focus on developing optimized solutions for our clients throughout the world. Our hands on practical experience, active engagement in the industry, and our applied research ensure that we provide state of the art solutions to our clients.



NFPA Compliant and Performance Based Design

FRA can assist in navigating the approval process for your tunnel or transit project. Our staff sit on numerous NFPA technical committees and are well versed in the application of modeling and analysis to support optimized ventilation, detection, and suppression system design. Our involvement can proceed throughout the lifecycle of the project from initial input into design fire development, ventilation and egress requirements to testing and commissioning of the system, FRA is your fire and life safety source. Furthermore our involvement with applied research and technical committees ensures that we bring knowledge to the table to help alleviate any potential future problems associated with changes in technology.

Transit and Transportation Services



Project Experience

- Denver International Airport
- Chicago Freight Tunnels
- Crosby-Goose Island Tunnel
- NY Transit East Side
- Lincoln Tunnel
- Architect of the Capitol
- Wiehle Avenue Metro
- Hyperloop/Boring Company
- Montreal Tunnel, CA
- Clyde Tunnel, Glasgow, UK
- Dartford Tunnel, London, UK
- Metro Santiago, Santiago, Chile
- Channel Tunnel, UK-France
- BAT Tunnel, Brisbane, Australia
- Evitamiento Tunnel, Lima, Peru

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Or visit us on the web to see our complete range of services

www.fireriskalliance.com

Smoke Control and Egress Modeling

FRA staff are experts in the use of zone, CFD, and specialty egress/people movement models. These tools are used for the evaluation of smoke movement, design of smoke control systems, and egress analysis in order to ensure that the design of fire protection, notification, and egress systems are appropriate. Smoke movement and control modeling ensures that tunnel or station ventilation conditions are well understood and that fans and vents are located and sized correctly.

From simple models to complex dynamic models such as Pathfinder, FRA can leverage the tools to identify potential pinch points, effects of barriers, signage, and smoke to ensure that occupants in potentially unfamiliar surroundings can egress in a safe manner.

Research and Development

FRA conducts and participates in applied research to enhance knowledge of fire detection and suppression in complex spaces. Our state of the art suppression lab is the only facility in the world able to quantify and characterize the output from sprinklers and spray nozzles and leverages patented technology resulting from 10 years of funded research. This information is then used in CFD models to demonstrate the effectiveness of water mist and other suppression systems.

Our work with lithium-ion batteries and alternative fuel vehicles gives us tremendous insight into the burning behavior of EV's and how modern vehicle construction and fuel loading can lead to changes in fire growth curves that are used as the basis for design fires.

