



Stand-Alone Tunnel Ventilation System vs. a Tunnel Supported by a Fixed Fire Fighting System.

The vast majority of road or train tunnels today are typically protected or depending on a stand-alone ventilation system, to create tenable conditions for evacuation and protect the tunnel infrastructure.

However, in several cases in the past and in recent time - latest July 28th at the Blackwall tunnel in London - this strategy hasn't been sufficient and has led to substantial traffic chaos and damage to tunnel infrastructure and significant period of down-time of important traffic net-work.

This happens because during a fire the most important task of a tunnel ventilation system is to prevent back-layer (smoke in the opposite direction of the traffic). A tunnel ventilation system is not particularly effective when it comes to preventing high temperature development or to suppress a fire or prevent fire spread.

Installing a Fixed Fire Fighting System (FFFS) to support a ventilation system is a strategy that is increasingly winning acceptance worldwide. Japan was the first country to install an FFFS more than 50 years ago, Australia installs an FFFS by default in all their road-tunnels.

If there had been an FFFS installed in the Blackwall tunnel, it had immediately suppressed a minor vehicle fire and the vehicle could have been towed away and left the tunnel infrastructure and road surface intact.



Tunnel Fire History

The **Mont Blanc tunnel fire** in 1999 was depending on a stand-alone ventilation system. The Mont Blanc disaster led to many casualties and totally destruction of the tunnel infrastructure and closure of the tunnel for months.

The **Burnley tunnel fire in Australia** in 2007 had a potential high HRR output similar to the catastrophic Mont Blanc fire. The Burnley fire was caused by collision by several HGV's and vehicles created both an explosion and fire, but due to the ventilation-/ Fixed Fire Fighting Systems interaction and quick activation the fire was suppressed and controlled, so that high temperatures and damage of tunnel infrastructure was prevented, including the road surface and tunnel could be opened after removing the damaged vehicles.