











- No system in place to quickly drain flammable and toxic liquids
- No automatic fire alarm system
- If a fire alarm is triggered, neither ventilation nor tunnel closure are automatically activated
- Monitoring and control of ventilation in the event of a fire are not sufficiently effective
- No evacuation lighting for tunnel escape route
- No signs showing the escape direction and distance to the nearest exit
- No tunnel control centre
- No regular training for tunnel personnel
- Radio communication is not provided throughout the entire tunnel for tunnel personnel
- No emergency response plan
- No regular emergency drills

**Plans for the future:**

- New video surveillance
- Emergency response plan
- Co-ordination between the tunnel operator, fire brigade, rescue service and police
- Link to the control centre in Rochester

**General remarks:**

- Tunnel designated as 'Medium risk' due to the high traffic volume (46,000 vehicles per day) and the unrestricted transport of hazardous goods
- Unidirectional traffic with sufficiently wide lanes and lighting are in part, the reasons for the good result for preventive measures.
- Gaps were found in the video surveillance.
- At present there is no permanently manned tunnel control centre where video images can be sent.
- An emergency call to the tunnel control centre is the only way staff (when on duty) can obtain detailed information concerning the situation in the tunnel.
- Traffic can be managed, if necessary, using traffic lights.
- In the event of a fire, the ventilation system and tunnel closure can only be activated by rescue services on site.
- Effective fire fighting is assisted by the short distances which the fire brigade have to cover to arrive at the tunnel and the adequate supply of fire-fighting water.
- No co-ordination of rescue service activities, neither in an emergency response plan nor by way of regular drills.
- Short distances between the clearly marked emergency exits assist self rescue.



Loibl <sup>1</sup>	Slovenia	Good	Low
Oswaldiberg	Austria	Good	Medium
Mala Kapela	Croatia	Good	High
Nievares	Spain	Good	Medium
Perdón	Spain	Good	Low
Sijtwende-Vliettunnel	Netherlands	Good	Medium
Sonnenberg	Switzerland	Good	High
Appia Antica	Italy	Acceptable	High
Bruck	Austria	Acceptable	Medium
Dortmund-Wambel	Germany	Acceptable	Medium
Kirchberg	Germany	Acceptable	Medium
Las Planas	France	Acceptable	Medium
Oslofiord	Norway	Acceptable	High
Rastatt	Germany	Acceptable	High
Ribeira Brava	Portugal	Acceptable	Medium
Calzadas Superpuertas	Spain	Poor	Medium
Cholfirst	Switzerland	Poor	High
Colle di Tenda <sup>2</sup>	Italy	Poor	Low
L'Arme	France	Poor	Low
Universität Düsseldorf	Germany	Poor	Medium
Fossina	Italy	Very Poor	Very Poor
Lorca	Italy	Very Poor	Medium
Medway	GB	Very Poor	Medium
Monte Pergola	Italy	Very Poor	High
Montecrevola	Italy	Very Poor	Low
Nes	Norway	Very Poor	Medium
Rovira	Italy	Very Poor	Low
Segesta	Italy	Very Poor	Medium

<sup>1</sup> Border tunnel between Slovenia Austria

<sup>2</sup> Border tunnel between Italy and France; only Italian section tested

















