Botne

EuroTAP rating: Acceptable

Location:	Norway, near Holmestrand E 18 between Oslo and Kristiansand
Year opened:	2001
Length:	1,380m
Portal height level:	110 / 126m above sea level
Number of tubes:	2 / unidirectional traffic
Speed limit:	100kph
Vehicles per day:	21,200
Share of HGVs:	15%
Breakdowns / accidents / fires:	0/ 0/ 0
Risk:	Medium

Strengths and weaknesses

- Two tubes with cross-connections as additional escape and rescue routes every 250 metres
- Traffic lights and barriers in front of the portals
- Traffic radio throughout the tunnel, the operator can broadcast messages
- Lay-bys in the middle of the tunnel
- Emergency phones provided every 250 metres and fire extinguishers every 125 metres
- No smoke or heat can penetrate into external escape routes, doors are sufficiently fire-resistant
- Ventilation is powerful enough to deal with a fire
- Rescue service vehicles can cross at the portals
- Tunnel control centre manned around the clock by trained staff
- Radio communications possible throughout the tunnel for tunnel staff, police and fire brigade
- Up-to-date and complete emergency response plan
- Regular training for tunnel staff, regular emergency drills

- Lighting is too weak
- No loudspeakers
- No video surveillance in the tunnel
- No automatic detection of traffic, traffic disruptions, nor of lay-by, emergency phone or fire extinguisher use
- Escape routes are not marked by evacuation lighting and are poorly signposted
- No automatic fire alarm system

☹ Fans are not temperature-resistant

☹ No continuous fire-fighting water supply in the tunnel, no hydrants

☹ The maximum time of use for the fire brigade's respiratory equipment is too short

Plans for the future

- 2010: Height checks to be set up at the portals
- 2010 to 2011: Ventilation to be improved, including measuring equipment
- 2015 to 2016: Lighting to be improved and special lighting to be installed for emergency exits and rescue routes; new traffic signs; installation of a video surveillance system with image analysis; fire alarm system to be installed

Briefly and to the point

- The medium risk found for driving through the tunnel is primarily due to a HGV share of 15 percent and the unrestricted transport of hazardous goods.
- Unidirectional traffic, sufficiently wide lanes and lay-bys are the main reasons for the acceptable result for preventive measures.
- Incidents in the tunnel are not automatically reported to the tunnel control centre. Tunnel staff are forced to rely on reports made by motorists using either the emergency phones or their own mobile phones. If necessary, motorists are guided using traffic lights and variable traffic signs along with information provided on displays and traffic radio. There is no automatic fire alarm system; this means that if a fire breaks out, the tunnel control centre must activate the ventilation system manually, close the tunnel and notify the fire brigade. Fire-fighting is difficult due to the lack of fire-fighting water in the tunnel. An emergency response plan and regular drills ensure good co-operation between the tunnel control centre and the emergency services.
- In the event of fire, there are good preconditions for effective self-rescue. The ventilation system draws smoke in the direction of traffic and out of the tube affected by the fire. In this area behind the fire zone, vehicles can leave the tunnel without difficulty. Anybody downstream of the fire is located in a smoke-free zone and can leave the tunnel through the emergency exits.