

Incident and Emergency Handling

Incident Handling in the complex Motorway Tunnels in Stockholm

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Incident Handling in the complex Motorway Tunnels in Stockholm

Background

Incident Handling

Incident systems

Examples

Conclusions



Background

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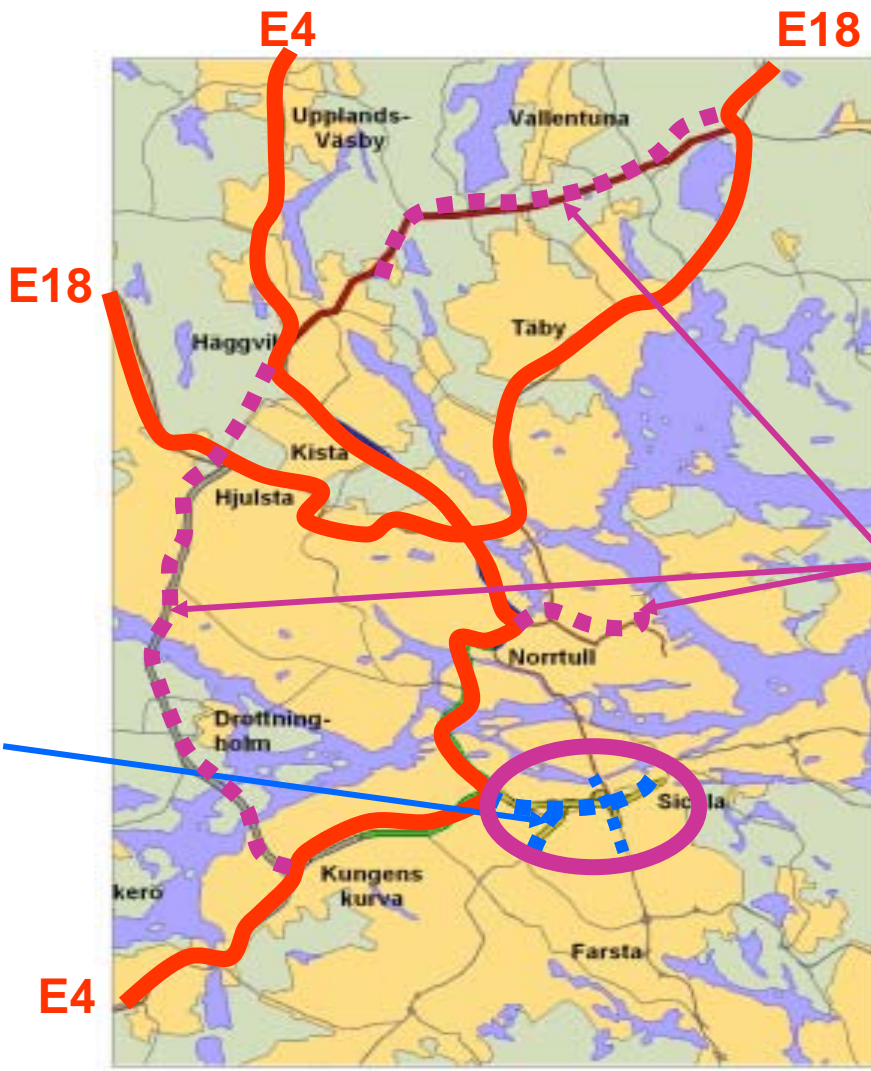
Traffic & Incident Management

- Governmental initiative
- Conurbation agreement to co-operate
- A comprehensive program covering all modes of transportation



Road Network Stockholm

- Background
- Incident handling
- Incident Systems
- Examples
- Conclusion



The TERN Network

The first tunnel link
To be open
2004

New tunnel links





South Tunnel Link - an access road to TERN To be open 2004

The TERN
network



Length: c 17 km

No lanes: 4-6

Description of functions and design

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Södra Länken is equipped with detectors that sense such things as smoke from a fire, air and traffic flow, etc. These, along with closed circuit TV, are used by the Traffic Management Centre to monitor tunnel safety around the clock. Traffic control is able to contact road users through a public address system, and can as necessary alert the "Road Assistance" team, the police, ambulances and the fire department.



Equipment in the evacuation routes

Loudspeakers



Fire hydrants

Emergency telephones



Fire extinguishers

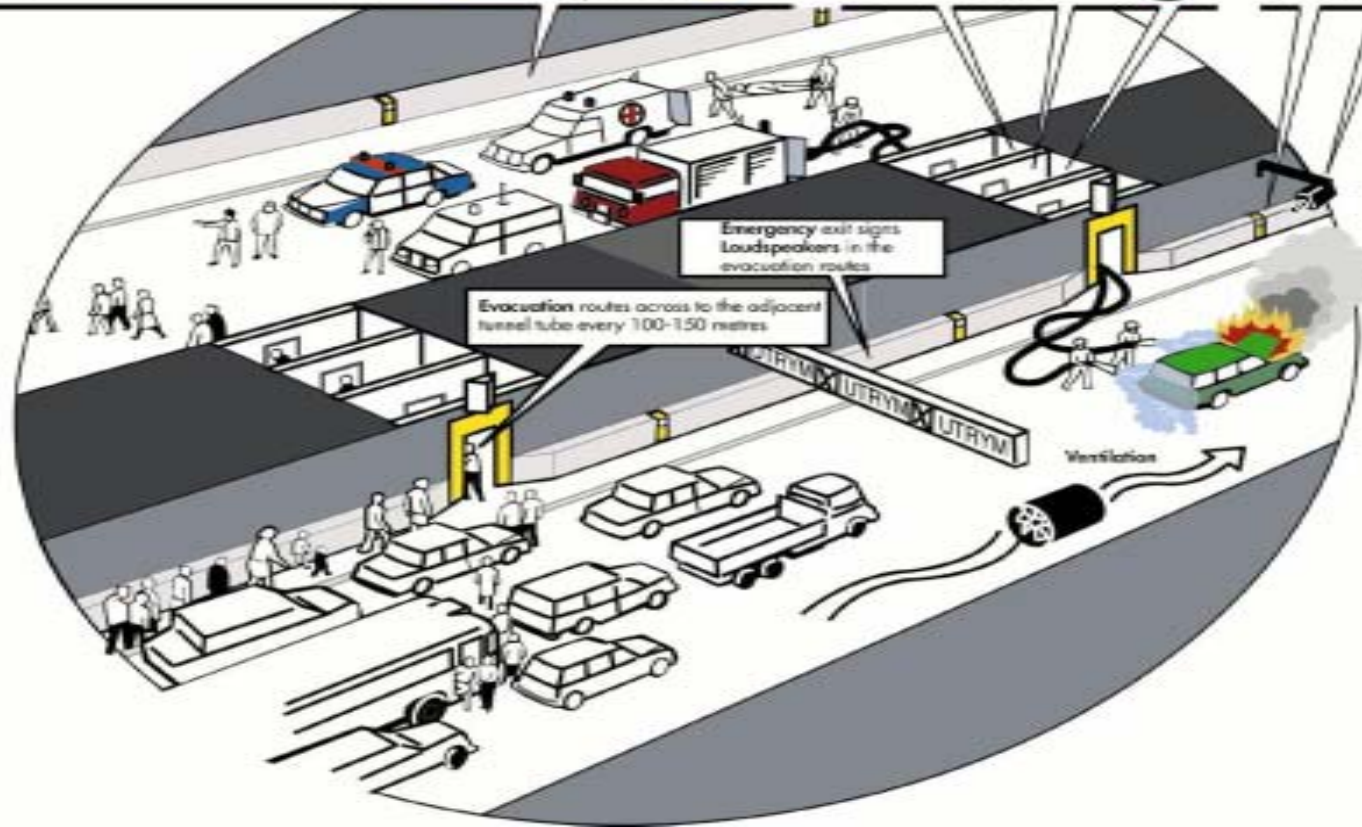


Surveillance

Closed circuit television cameras as well as fire, air pollution and traffic detectors



air pollution and traffic detectors



Incident and Emergency Handling

Main task: to ensure a safe and
"take care" driving of people and goods

- Co-operation between organisations
- An understandable design,
 - such as architectural language, landmarks, emergency exits etc.
- Systems which are boundless
 - in terms of TMP's and IEH
- Detection of un-expected events
- Detection of mal-functions in crucial systems

Incident Systems

Main task: to ensure an accurate and reliable incident detection

- Automatic systems
 - Traffic warning systems, such as AID, stopped vehicle, variable directional signs
 - Fire, dangerous goods vehicles detection systems
 - People on crucial spots, in tunnel, on motorway
- Manual systems
 - Confirmation tools, such as CCTV
 - Emergency fleet, "vägassistans"
 - Equipment for closing lane, direction, road
- Exchange of information
 - Between TMC at different organisations, police, "112-organisation", fire brigades, radio etc
 - Agreements/routines, IEH-plans
- Operator supportsystem

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Emergency exit

on every 100–150m:

- emergency telephone, (only in tunnels)
- fire-extinguisher
- loud-speaker



Automatic Incident Detection, Lane Closure

IEH
Stockholm

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Algorithm
Detection-technique
Graceful degradations



Incident Management Greater Stockholm

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Road - assistance

- Dispatched from TMC
 - Radius ca 10 km, main road network
 - Operating time 0430 – 1900 working day
 - Two trucks
 - Tow-away vehicle
 - Police
-
- Will be two more trucks 2004, one in 24 hours operation



Emergency situations

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"Evacuate tunnel"

"Stop engine"

Safety procedures depends on type of Incident,

- Tunnel closed at entrances
- re-routing of drivers in- and outside the tunnel
- Emergency team
- Ventilation
- Dangerous goods



Use of VDS

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Conclusions

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- IEH is vital from safety and security point of view
- IEH has close connection to Traffic Management
 - Share many joint systems
- "Incident Systems" must be reliable from traffic engineering, incident management and technical point of view
- Well defined and joint plans between different organisations



End



Questions?





"VägAssistans" is dispatched by the TMC, Trafik Stockholm

Vägassistans – a cooperation between Vägverket, city of Stockholm and police

Collected info

- Location, GPS
- Time
- Type of incident
- Duration of the incident at spot
- Database

