ITA COSUF

ITA Committee on Operational Safety of Underground Facilities

Updated survey of existing regulations and recognised recommendations (operation and safety of road tunnels)

Table of contents

1 INTRODUCTION **4**

2 OBJECTIVE AND CONTENTS OF THE DOCUMENT **5**

3 LIST OF COLLECTED GUIDELINES (EU Members States) **6**

3.1 EUROPEAN DIRECTIVE *6*

3.2 AUSTRIA *13*

3.3 CZECH REPUBLIC *15*

3.4 DENMARK *17*

3.5 FINLAND *18*

3.6 FRANCE *19*

3.7 GERMANY *23*

3.8 GREECE *25*

3.9 HUNGARY *27*

3.10 ITALY *28*

3.11 LUXEMBOURG *29*

3.12 THE NETHERLANDS *31*

3.13 POLAND *33*

3.14 PORTUGAL *34*

3.15 SLOVAKIA *35*

3.16 SLOVENIA *37*

3.17 SPAIN *39*

3.18 SWEDEN *41*

3.19 UNITED KINGDOM *44*

4 LIST OF COLLECTED GUIDELINES (Other Countries)..... 45
4.1 AUSTRALIA..... 45
4.2 CANADA..... 48
4.3 CHINA..... 50
4.4 CROATIA..... 51
4.5 JAPAN..... 52
4.6 NORWAY..... 54
4.7 SINGAPORE..... 55
4.8 SOUTH KOREA..... 57
4.9 SWITZERLAND..... 58
4.10 U.S.A..... 61
5 LIST OF COLLECTED GUIDELINES (International organizations)..... 63
5.1 PIARC..... 63
5.2 ITA..... 72
5.3 NVF Nordic Road Association..... 73

1 INTRODUCTION

The Committee on Operational Safety of Underground Facilities (COSUF) of the International Tunnelling and Underground Space Association (ITA) was created in May 2005 following a joint initiative of eight European research projects aiming at improved tunnel safety. Its scope is the safety during operation of tunnels and other underground facilities. The committee closely co-operates with the Technical Committee on Road Tunnel Operations of the World Road Association (PIARC) in the framework of a Memorandum of Understanding between ITA and PIARC.

In order to carry out its ambitious work programme, ITA COSUF has set up four Activity Groups (AG):

- AG 1 - Interaction with European and international initiatives
- AG 2 - Regulation and best practice
- AG 3 - Research and new findings.
- AG 4 - Road tunnel safety officers

Under the action plan of AG 2, a general survey of existing regulations and recognised recommendations regarding operation and safety of road tunnels has been drawn up and published on ITA COSUF website on 30 April 2008. This first version was based on the products of the European thematic network FIT (Fire In Tunnels) and a survey launched by COSUF in March 2007, mainly among its members and those of the PIARC Road Tunnel Operations committee.

In February 2011, it was felt necessary to update this document because numerous new regulations and recommendations had been released in the past 4 years. Additionally PIARC was preparing an electronic Tunnel Manual, which would be made available on its website in September 2011. As this manual would refer to a list of relevant regulations and recommendations, it was decided that it would refer to the COSUF survey rather than duplicate work by launching a specific PIARC survey. This would be part of the continuous co-operation between ITA COSUF and PIARC.

The present document is the result of this updating process and includes new data received from 27 countries:

- Information has been included for 7 countries which were not covered by the 2008 survey: Canada-Quebec, P.R. China, Finland, Hungary, Portugal, Singapore, South Korea
- Existing information from 20 countries has been updated: Australia, Austria, Czech Republic, Denmark, France, Germany, Greece, Italy, Japan, Luxembourg, Netherlands, Norway, Poland, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom, USA

Additionally, the information from international organisations has been updated: World Road Association (PIARC), International Tunnelling and Underground Space Association (ITA), Nordic Road Association (NVF).

2 OBJECTIVE AND CONTENTS OF THE DOCUMENT

The objective of this report is to provide a list of existing legislation, regulations and recognised guidelines regarding operation and safety of road tunnels. It intends to be a tool for all those involved in road tunnel safety.

The topics covered by this report are all those related to operation and safety: operational and safety facilities, operational means and procedures, safety approaches, risk analysis and evaluation, etc.

The report takes into account:

- **Legislation and regulations** – i.e. compulsory: law, Ministerial decree, order, governmental circular, etc.
- **Recognised recommendations** – advisory, that is to say any kind of recommendation which is applicable to several tunnels and provided by governmental or professional bodies (handbook, technical note, report, etc.).

The report includes lists of collected guidelines concerning: EU Member States (section 3), other countries (section 4) and international organizations (section 5).

Links to most of the mentioned documents are provided in the report to help find them on the internet.

The publication of this report has been approved by ITA COSUF Steering Board in August 2011.

3 LIST OF COLLECTED GUIDELINES (EU Members States)

3.1 EUROPEAN DIRECTIVE

This paragraph deals with the European Directive 2004/54/EC and its implication on the national regulations of the EU Member States. This Directive applies to all tunnels longer than 500 m on the Trans-European Road Network (TERN). It was transposed into national laws, regulations and/or administrative provisions by all EU Member States who had existing or planned tunnels concerned by the Directive.

This Directive introduced some harmonisation in the national organisation, procedures and minimum measures of the EU countries regarding safety of road tunnels. This is all the more true since many EU countries decided to apply all or part of these provisions to tunnels beyond the scope of the Directive (shorter tunnels on the TERN and/or tunnels not on the TERN).

This is the reason why the EU countries are dealt with separately in this report.

3.1.1 Legislation

Date of last update of the table: 21 July 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Directive of the European Parliament and of the Council on minimum safety requirements for tunnels in the Trans-European Road Network	2004/54/EC) http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2004L0054:20090807:EN:PDF	29 April 2004	Directive	Corrigendum of 7 June 2004 Amended by Regulation (EC) No 596/2009 of 18 June 2009	Yes

3.1.2 Recognised recommendations

Date of last update of the table: 21July 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Interpretation of Directive 2004/54/EC	TREN E3	30 Jan. 2007	Informative note of the European Commission	Number of lanes; emergency response plans	Yes
Interpretation of Directive 2004/54/EC	TREN E3	12 June 2008	Informative note of the European Commission	Emergency signs pointing to portals; closure of lanes	Yes

3.1.3 Transposition of the European Directive into national regulations (EU Members States)

The Directive has been transposed by all EU Member States who have existing or planned tunnels longer than 500 m on the TERN (20 states out of 27). In most of them, the minimum requirements are applied also for tunnels beyond the scope of the Directive. More detailed information is provided in the following table.

Country	Transposition	Date of last update of the information	Comments
Austria	The Directive was transposed in 2006. National law is stricter than the Directive. The Federal Ministry acts as Administrative Authority. The Safety Officer is nominated by the Tunnel Manager and the Inspection entity is organised within the Administrative Authority. 59 tunnels are concerned, among which many are quite long. For new tunnels on motorways a chapter on road safety is required in the Environmental Impact Assessment. Since 2006, incidents forms are drafted for all motorways tunnels. Since April 2007, the form has been electronically filled-in. A risk analysis methodology is available (PIARC).	25 Feb. 2011	At the end of 2010 an amendment of the national law became effective
Belgium	The Directive has been transposed on Federal level. There are 5 tunnels on TERN and longer than 500 m. However, requirements of the Directive will be extended also to other tunnels on Belgian territory not being in the scope of the directive. Experts are working on the	15 May 2007	

Country	Transposition	Date of last update of the information	Comments
	methodology for risk analysis; it is expected to be approved soon.		
Bulgaria	The Directive has been transposed. Refurbishing works have already started. The Ministry of Transport will act as Administrative Authority and as Inspection entity. Tunnel Manager will be the National Road Infrastructure Entity, which will nominate the Safety Officers. 4 tunnels are concerned. Their compliance assessment is under progress. A risk analysis methodology is still missing.	31 Oct. 2007	
Czech Republic	The Directive has been transposed by an administration act in 2009. There are 5 tunnels concerned on TERN that are longer than 500 m. Stricter requirements than those of the EU directive are applied to all tunnels (not only for those on TERN).. By 2014, 24 tunnels in the scope of the Directive will be in operation. The Ministry of Transport acts as the administrative authority. Road and Motorway Directorate acts as the tunnel manager. The risk analysis method is largely inspired from the French method developed by CETU.	10 May 2011	
Denmark	The Directive has been transposed for public tunnels on the national highway network. Two separate Administrative Authorities have been appointed by the Ministry of Transport to be responsible for the implementation of the EU Directive 2004/54/EC for tunnels concerned. The Road Directorate (1) administers 4 major tunnels on the national road network and Sund & Bælt Holding (2) administers 2 major tunnels on the Oresund Highway and Link to Sweden covered by the EU Directive. For the remaining road tunnels under planning and design the Road Directorate will be appointed as Administrative Authority. The assessment of compliance has been made for all tunnels covered by the EU Directive. For the international tunnel between Denmark and Sweden, an intergovernmental agreement was established in January 2007. Administrative authorities are working together to agree on a common methodology for risk analysis and establishment of inspection entity.	14 March 2011	
Finland	Directive was transposed into national legislation in June 2006 (revised in 2009). The Finnish Transport Agency (FTA) will act as administrative authority. FTA has issued binding regulations concerning management and safety standards of road tunnels, and transport of dangerous goods in tunnels. According to law, FTA shall also provide technical guidelines concerning road management and technical regulations concerning enactment and application of directive 2004/54/EU. Preliminary guidelines on tunnel design and safety standards, including risk analysis were prepared in 2005. They are currently being revised, based on the PIARC quantitative method.	13 May 2011	

Country	Transposition	Date of last update of the information	Comments
	In Finland there are 5 tunnels on the TERN network longer than 500 m. However requirements will be applied to all tunnels > 200 m.		
France	Before 2004, requirements of the French legislation were already very close to the requirements of the Directive and in some cases stricter. The national legislation concerns all tunnels longer than 300 m (about 200 existing tunnels). So, mainly edits and additions were necessary to ensure full transposition. A transposing law on administrative procedures was adopted in January 2006, a transposing decree was published in November 2006. Very similar procedures are applied to all tunnels longer than 300 m, regardless of their being concerned by the Directive or not. The transposition concerned 28 existing tunnels and 4 tunnels in construction longer than 500 m and on TERN, fully in France. The *Préfets* of the different *départements (local representatives of the governement)* act as Administrative Authorities. For the 3 international tunnels concerned by the Directive, 2 shared with Italy and 1 with Spain, transposition took place in the framework of bilateral agreements. A guide on road tunnel safety documentation, including among others the description of the risk analysis methods, has been produced and made available on CETU web site (http://www.cetu.developpement-durable.gouv.fr) in both French and English. The risk analysis method for transport of dangerous goods will be updated to accommodate the ADR 2007-2009 modifications. Data on accidents in tunnels are collected and have been published every year since 2001.	21 July 2011	
Germany	The Directive has been transposed into national legislation (RABT). With regard to the technical equipment of road tunnels, German guidelines exceed the EC requirements. 11 Administrative Authorities are responsible for a total of 28 tunnels on TERN: they all have 2 tubes and are on motorways. A single reporting system has been created and will concern all tunnels longer than 400 m. Two risk assessment methods are applied. One method is used for the risk assessment of tunnels with special characteristics, for the assessment of compensation measures in existing tunnels and for the decision of the ventilation system in bidirectional tunnels with a length between 600 m and 1 200 m. This method also takes costs/benefits considerations into account. The second method is used for the risk assessment of dangerous transports through road tunnels and the categorization of the tunnels according to ADR. The second method is available on www.bast.de	16 June 2011	

Country	Transposition	Date of last update of the information	Comments
Greece	The Directive has been transposed into national legislation in November 2007. There is one Administrative Authority which has national jurisdiction for a total of 47 tunnels on the TERN (within the scope of directive) and comprises 5 members coming from the Ministry of Public Works, Ministry of Transportation, Fire Brigade and Egnatia Odos A.E. (public motorway company). Tunnel Managers have been identified by the Administrative Authority for all of these 47 tunnels. Safety Officers have been appointed also. A risk analysis methodology has been adopted for use at national level. This methodology adopts two distinct methods: one for risk arising from transport of DGs and another for all other vehicles without involvement of DGs. The last one is a scenario analysis. National design guidelines are stricter than the Directive	4 March 2011	
Hungary	The Directive has been transposed by issuing a government regulation in 2007. Four motorway tunnels in the scope of the Directive have been put in operation on the new Motorway M6 (TERN corridor 5/c) in September 2010. In order to ensure full compliance with EU laws, renewal and modification of the Hungarian Design Code was introduced in early 2008.	22 Feb. 2011	
Ireland	The Directive has been transposed. The National Roads Authority acts as Administrative Authority. 3 tunnels on TERN are concerned, 1 of them is under construction. A methodology for risk analysis is missing. Safety Officers have been already designated for 2 tunnels.	15 May 2007	
Italy	The Directive has been transposed in 2006. The *Commissione Permanente del Consiglio Superiore dei Lavori Pubblici* acts as Administrative Authority. 535 tubes are concerned for a total length of about 635 km.	15 May 2007	
Latvia	The Directive will be transposed by end of 2006. In Latvia there are no tunnels concerned.	31 Oct. 2006	
Luxembourg	The Directive has been transposed in October 2007. All tunnels on TERN are covered by the regulation. Currently, 2 relatively new tunnels fall within the scope of the Directive, but some others are under construction or planned. The risk analysis method for transport of dangerous goods is inspired from the Swiss method. It will be finalised this year and will only be applied where transit of dangerous goods is permitted. An external and independent body ("*L'inspection du Travail des Mines*") will act as Administrative Authority. Tunnel Manager will be the also independent "Central Highways Division". Inspection entities will be selected by the Administrative Authority. In order to conciliate safety and economic reasons, a Higher Council of interested Ministries has been	15 May 2007	

Country	Transposition	Date of last update of the information	Comments
	created, acting as Supervisory Body.		
The Netherlands	The Directive has been transposed in June 2006. Quantitative risk analysis and risk analysis based on scenarios are being developed. Stricter requirements than those of the EU directive apply to all tunnels > 250 m, also to those not being part of the TERN. The Municipalities where the tunnels are situated will act as Administrative Authorities. As far as the state owned tunnels are concerned, one person is appointed as Safety Officer for all tunnels. The private tunnels and those who are owned by provinces and municipalities have their own Safety Officer. Some persons are appointed as Safety Officer for more than one tunnel. A Committee on Tunnel Safety will act as Advisory Board (the minister of Infrastructure has recently announced that this Committee will be skipped in the revision of the tunnel law in 2011). A standard quantitative risk analysis methodology is being developed (*Rijkswaterstaat*).	23 March 2011	
Poland	Most of the directive was transposed in 2008.	5 May 2011	
Portugal	The Directive has been transposed by a Decree Law (27/03/2006) referring to all tunnels existing on national roads with a length equal to or greater than 500 m. All these tunnels (5) were inspected in 2008 by the National Laboratory for Civil Engineering (LNEC), as required by the National Administrative Authority (INIR), with the assistance of the respective Safety Officer, proposed by the Tunnel Manager and appointed by the Authority. In 2011 a new tunnel was opened to the public, previously inspected according to the Directive. The PIARC risk analysis methodology has been followed in the country.	6 July 2011	
Romania	The Directive has been transposed. There are currently no tunnels > 500 m on TERN. A tunnel with a length of 800 m is planned (feasibility study made) and should be ready by 2010. The Ministry for Transport will act as administrative authority. The Directorate for Roads will act as tunnel manager. A risk analysis method should be ready by beginning of 2009.	15 May 07	
Slovakia	The Directive has been transposed by an administration act in 2006. There are 3 tunnels concerned on TERN that are longer than 500 m. Stricter requirements than those of the EU directive are applied to all tunnels (not only for those on TERN). . The Ministry of Transport, Construction and Regional Development will act as administrative authority. Národná diaľničná spoločnosť will act as tunnel manager. A risk analysis methodology has been available since May 2011.	10 May 2011	

Country	Transposition	Date of last update of the information	Comments
Slovenia	The Directive has been transposed in May 2006. Parts which are not covered by national standards rely on Austrian RVS. There are 12 tunnels longer than 500m, which are part of TERN in the country. Risk analyses are done for the 2 newest tunnels; for 10 other tunnels, risk analyses are in process of correction based on review.	21 Feb. 2011	
Spain	The Directive has been transposed in 2006. Provisions of the Directive have been extended also to tunnels which are not part of TERN. 396 tunnels are concerned, 232 of them are on the TERN. Technical requirements in some cases go further than the Directive. The *Secretaría de Estado de Infraestructuras y Planificación* acts as Administrative Authority. Safety Officers can be different at each stage of the life of a tunnel. Experts are working on a method for risk analysis, but there is still low national and international experience on the issue.	28 April 2011	The national law is not only a mere transposition of the European Directive as far as it includes further requirements and scope.
Sweden	A law and an ordinance to transpose the Directive incl. Annex 2 have been adopted in July 2006. A transposing regulation on Annex 3 has been adopted in February 2006 and the transposing regulation on Annex 1 has been adopted in July 2007. The Swedish Transport Agency will act as the Administrative Authority. Regional Officers of the Swedish Transport Administration will be the Tunnel Managers. The tasks of the Safety Officer will be performed by an expert group within the Swedish Transport Administration. The requirements will be applied to all tunnels that are longer than 500m and designed after June 2006. On the TERN network (2010) there is 1 tunnel in operation, 1 tunnel under construction and 3 in the planning/design phase.	3 March 2011	
United Kingdom	The Directive has been transposed in full through The Road Tunnel Safety Regulations 2007 (Statutory Instrument No. 1520, published by The Stationary Office, UK) for all tunnels over 500m in length that form part of the trans-European road network.	20 June 2011	

3.2 AUSTRIA

3.2.1 Legislation

Date of last update of the table: 25 February 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Guidelines and Regulations for Road Construction*:	RVS ref:		Guideline supported and funded by the Administration	Guidelines are considered sufficient	
1 Alignment Regulations for Tunnels	09.01.21	2007			Yes
2 Tunnel cross section	09.01.22	2010			Yes
3 Interior Construction	09.01.23	2009		amendments 2010	Yes
4 Structural Equipment	09.01.24	2009			Yes
5 Tunnel Entrance Areas	09.01.25	2009			Yes
6 Constructional fire protection in transportation buildings for roads	09.01.45	2006			Yes
7 Tunnel Equipment	09.02.22	2010		revised version	Yes
8 Ventilation, Fundamentals	09.02.31	2008		English version available	Yes
9 Ventilation, Fresh air demand	09.02.32	2010			Yes
10 Lighting	09.02.41	2009			Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
11 Tunnel Radio Facilities	09.02.61	2009			Yes
12 Methodology of Risk Analysis	09.03.11	2008			Yes
13 Risk Assessment of Dangerous Goods Transports in Road Tunnels	09.03.12	2010		Draft	
14 Monitoring, control and test - Structurally constructive parts	13.03.31	1995			Yes
15 Tunnel, Maintenance and Operation	09.04.11	2008			Yes
16 Maintenance of tunnel equipment	13.03.41	1999			Yes
17 Training matters – Qualifications and training of staff involved in the operation of tunnels and above-ground tunnels	14.02.15	2008		new guideline	Yes

* published by the Austrian Association for Research on Road and Rail Transport, and available on their website: www.fsv.at

3.2.2 Recognised recommendations

Date of last update of the table: 25 February 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
-	-	-	-	-	-

3.3 CZECH REPUBLIC

3.3.1 Legislation

Date of last update of the table: 11 March 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
1. Projektování tunelů pozemních komunikací (Design of road tunnels) Czech standardization committee	ČSN 737507	2005	Czech standard	Basic standard describing construction, technological systems and safety equipments, pp. 57 Also in English	Yes, update in 2011
2. Technologické vybavení tunelů pozemních komunikací (Road tunnel equipment) Ministry of transport	TP98 (English version on www.eltodo.cz)	2004	Technical standard and guidelines ISBN 80-239-0110-9	Tunnel as telematics system, categorization of tunnels, traffic system, lighting, ventilation, video detection, safety systems, SCADA, power supply, pp. 106	Yes
3. Technologické vybavení tunelů pozemních komunikací – změna 1 (Road tunnel equipment-amendment 1) Ministry of transport	TP98 – Z1 (Czech version on www.eltodo.cz)	2010	Amendment of TP98 and guidelines	Traffic telelematics architecture, new tunnel safety categories, high occupied tunnels, section speed control, human behaviour, lighting in short tunnels, pp. 42	Yes
4. Provoz, správa a údržba tunelů (Operation and maintenance of road tunnels) Ministry of transport	TP154 (Czech version on www.eltodo.cz)	2009	Technical standard and guidelines ISBN 978-80-254-4193-0	Documentation, inspections, checking of construction and equipments, maintenance, life cycle, data elaboration, pp. 117	Yes 2nd issue
5. Bezpečnost v tunelech (Safety in the road tunnels) Ministry of transport	TP229 (Czech version on www.eltodo.cz)	2011	Technical standard and guidelines ISBN 978-80-254-7953-7	Tunnel safety categories, overview of risk analysis methods, simulation, qualitative method SAFMEA, quantitative method CAPITA, requirement of central evidence of accidents, pp.	Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
				87	
6. Školení obsluh - metodika (Training of tunnel staff – methodology)		2009	Methodology issued by Ministry of transport and Ministry of interior	Operational staff, requirements, categories of courses (regularly, extraordinary), eLearning, simulator, certification, ... pp. 63	Yes
7. Zkoušky požárně-bezpečnostních zařízení tunelů (Tests of fire safety equipments in tunnels – methodology)		2011	Methodology issued by Ministry of transport and Ministry of interior	Basic type of tests, factory tests, tests in tunnel, hot smoke tests, simulation by hot aerosol; test of dispatchers in „real“ conditions, …, pp. 33	Yes

Some documents which are not on the Eltodo website can be bought at the National Standardization Institute ÚNMZ.

3.3.2 Recognised recommendations

Date of last update of the table: 11 March 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
-	-	-	-	-	-

3.4 DENMARK

3.4.1 Legislation

Date of last update of the table: 14 March 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Law on Public Roads	Departmental order no 726 Can be downloaded from: https://www.retsinformation.dk/Forms/R0710.aspx?id=120603&exp=1	June 2008	Law		Yes

3.4.2 Recognised recommendations

Date of last update of the table: 14 March 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
No document published. In Denmark there are no Standards, Codes or Guidelines to be applied related to existing and new tunnels. In each case a complex of requirements to follow are elaborated separately.			Reference Group Guideline/Recommendation	1) National reference group of tunnel owners established 2) National group established to prepare guideline on tunnel safety assessment	Yes

3.5 FINLAND

3.5.1 Legislation

Date of last update of the table: 13 May 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Road Act (Law on Public Roads)		June 2006 (rev. 2009)	Law		Yes
Road Traffic Act		2006	Law	Traffic signs Driving in tunnels	Yes
Management of and safety regulations and guidelines for road tunnels (Tietunnelien hallinnointi ja turvallisuutta koskevat määräykset ja ohjeet)	Link http://alk.tiehallinto.fi/thohje/pdf/tietunneli_maaraykset_2008.pdf	Dec. 2008	Binding regulations	Only in Finnish	Yes
Transport of dangerous goods in road tunnels. Risk analyses and transport restrictions (Vaarallisten aineiden kuljetukset tietunneleissa. Riskianalyysit ja kuljetusrajoitukset	Link http://alk.tiehallinto.fi/thohje/pdf/tietunnelit_vaarall_aineiden_kuljetukset_riskianal.pdf	Dec. 2008	Binding regulations	Only in Finnish	Yes
Design Guideline for Road Tunnels (draft)		2005	Guideline / recommendations	Only in Finnish	Partly

3.5.2 Recognised recommendations

Date of last update of the table: 13 May 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
-	-	-	-	-	-

3.6 FRANCE

3.6.1 Legislation

Date of last update of the table: 23 August 2011

Title / Issued by	Reference (link)	Date	Administra-tive status	Comments	Still in force
Legislation applicable to tunnels longer than 300m:					
Inter-ministerial circular concerning safety in the tunnels of the national road network: - *circular – no longer in force* - *annex 1 (procedures) – no longer in force* - annex 2 (technical instruction) – still in force	Circ 2000-63 Annex 2	25 Aug. 2000	Circular	Annex 2 is applicable to national network only. It is also considered a reference document for locally owned tunnels	 No No Yes
Inter-ministerial circular concerning the regulation of traffic with dangerous goods in road tunnels of the national network.	Circ 2000-82	30 Nov. 2000	Circular	Outdated and no longer used, although officially still applicable	No
Law relating to safety of infrastructures and transport systems	Law 2002-3	3 Jan. 2002	Law	Makes it possible to impose similar procedure to locally owned tunnels as to those owned or conceded by the State.	Yes

Title / Issued by	Reference (link)	Date	Administra-tive status	Comments	Still in force
Decree relating to safety of structures of the road network	Decree 2005-701	24 June 2005	Decree	Extended the previous procedures (circ 2000-63) to all new and existing road tunnels longer than 300 m, whoever their owner	Yes
Circular relating to safety of road tunnels longer than 300 m	Circular 2006-20	29 March 2006	Circular	Replaces circ 2000-63 appendix 1 (procedures)	Yes
Decree relating to safety of structures of the road network	Decree 2006-1354	8 Nov. 2006	Decree	Adapts procedures for all tunnels longer than 300m	Yes
Interministerial order relating to contents and update of the safety documentation, review of the incidents and accidents.	Order of 18/04/07	18 April 2007	Inter-ministerial order		Yes
Circular relating to establishing safety diagnoses of road tunnels longer than 300 m	Circ of 12/6/2009	12 June 2009	Circular	Accelerates procedures to check safety of existing tunnels	Yes
Legislation applicable to tunnels on Trans-European Road Network and longer than 500 m:					
Law relating to safety and development of transports (article 10)	Law 2006-10 art.10	5 Jan. 2006	Law	Transposition of the EU Directive into French law	yes
Decree 2006-1354 of 8 November 2006 relating to safety of structures of the Road Network	Decree 2006-1354	8 Nov. 2006	Decree	Transposes Directive 2004/54 into French regulations	yes
Interministerial order of 8 November 2006 giving the minimal safety requirements applicable to tunnels longer than 500 m on the Trans-European Road Network (TERN)	Order of 8/11/06	8 Nov. 2006	Interministerial order	Transposes Directive 2004/54 into French regulations	Yes
Interministerial order modifying the Interministerial order of 8 November 2006 giving minimal safety requirements applicable to tunnels longer than 500 m on the TERN.	Order of 9/11/07	9 Nov. 2007	Interministerial order	Adapts safety measure for TERN tunnels longer than 500m	Yes

All parts of the above laws and decrees relevant to road tunnel safety (except transitional provisions) have been integrated into the Code of Public Roads (Code de la voirie publique) and form Chapter VIII of Part I of this code.

All legislative and regulatory texts (laws, decrees, interministerial orders) which apply to road tunnels are compiled in a single document (in French only): "Textes législatifs et réglementaires sur la sécurité des tunnels routiers – version consolidée à la date du 9 novembre 2007" (http://www.cetu.developpement-durable.gouv.fr/IMG/pdf/Textes_legislatifs_et_reglementaires_9-11-2007_V1a_cle76c55c.pdf).

In addition to this compilation, the three aforementioned circulars are applicable:

- Appendix 2 (technical instruction) of circular 2000-63 of 25 august 2000
- Circular of 29 march 2006
- Circular of 12 June 2009

All documents are available in French on the website of CETU: www.cetu.developpement-durable.gouv.fr. Appendix 2 of circular 2000-63 of 25 August 2000 is also available in English.

3.6.2 Recognised recommendations

Date of last update of the table: 21 July 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Guide to road tunnels safety documentation: • Booklet 0: Safety Documentation Objectives. • Booklet 1: Practical method of compiling the safety documentation. • Booklet 2: Tunnels in operation "from the existing condition to the reference condition". • Booklet 3: Risks analyses related to dangerous goods transport. • Booklet 4: Specific Hazard Investigations • Booklet 5: Emergency Response Plans	 Booklet 0 - Booklet 2 Booklet 3 Booklet 4 Booklet 5	 2003 - 2003 2005 2003 2006	Recommendation	All booklets are available in French and English (except booklet No.1 - to be published)	Yes
Tunnel geometry manual	Dossier pilote géométrie	Dec. 1990	Recommendation	In French only	Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Tunnel lighting manual	Dossier pilote Éclairage	Nov. 2000	Recommendation	In French only	Yes
Tunnel ventilation manual	Dossier pilote ventilation	Nov. 2003	Recommendation	In French only	Yes
Fire behaviour of road tunnels - Methodological guide - Complements to the guide	Guide Fire Behaviour Complements to the guide	March 2005 March 2011	Recommendation Recommendation	In French only In French only	Yes Yes
The course of emergency operations in case of fire in road tunnels	Information note No. 13	2005	Information note	In French only	Yes
Provisions for signing in road tunnels	Information note No. 16	April 2009	Information note	In French only	Yes
Application of the new regulation regarding dangerous goods in road tunnels	Information note No. 17	Aug. 2009	Information note	In French only	Yes
Taking into account vehicles above height gauge near road tunnels	Information note No. 18	Dec. 2009	Information note	In French only	Yes
Water mist in road tunnels	Water mist document	June 2010	Information document	In French and English	Yes
Signing and provision to help users' self-evacuation in road tunnels	Self-evacuation document	Dec. 2010	Information document	In French only	Yes

All these documents are issued by CETU and available on the website: www.cetu.developpement-durable.gouv.fr.

3.7 GERMANY

3.7.1 Legislation

Date of last update of the table: 15 June 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
RABT Guidelines for the Equipment and Operation of Road Tunnels (Richtlinien für die Ausstattung und den Betrieb von Strassentunneln) Published by the German Road and Transportation Research Association (FGSV - Forschungsgesellschaft für Strassen- und Verkehrswesen)	ARS No.10/2006	2006	Ministerial decree		Yes
ZTV ING, Teil 5 - Additional Technical Contract Conditions and Guidelines for Civil Engineering Works (Zusätzlichen Technische Vertragsbedingungen und Richtlinien für Ingenieurbauten), Part 5 (Tunnel Engineering) Sec. 1: NATM Tunnel Sec. 2: Cut and Cover Tunnel Sec. 3: Mechanized Tunnel Sec. 4: Operational Equipment Sec. 5: Sealing-System Published by Federal Highway Research Institute, www.bast.de	ARS No.12/2010	2007	Ministerial decree		Yes
Guideline for safety evaluations of road tunnels according to RABT 2006 (Section 0.5) Published by Federal Highway Research Institute, www.bast.de		2009	Approved by the Administrative Authorities		Yes
Guideline for safety documentations according to RABT 2006 (Section 1.1.5)		2009	Approved by the Administrative		Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Published by Federal Ministry of Transport, Building and Urban Development (BMVBS) and Federal Highway Research Institute (BASt)			Authorities		
Method for the Categorization of Road Tunnels according to ADR 2007 Published by Federal Highway Research Institute, www.bast.de		2009	Approved by the Administrative Authorities		Yes
Method for the evaluation of the safety of road tunnels Published by Federal Highway Research Institute, www.bast.de		2007	Approved by the Administrative Authorities		Yes
Verfahren für die Auswahl von Straßenquerschnitten in Tunneln - Procedure for the selection of cross-sections in road tunnels Published by Federal Ministry of Transportation, Building and Urban Development	ARS 6/2000	2000	Ministerial Decree		Yes
HBS Handbuch für die Bemessung von Straßen und Verkehrsanlagen - Handbook for the design of roads and road-infrastructure Published by German Road and Transportation Research Association	ARS 10/2002	2009	Ministerial Decree		Yes
Betriebstechnische Ausstattung von Straßentunneln - Ereignismeldewesen - Equipment of road tunnels – incident reports Published by Federal Ministry of Transportation, Building and Urban Development	ARS 3/2008	2008	Ministerial Decree		Yes

3.7.2 Recognised recommendations

Date of last update of the table:15 June 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
-	-	-	-	-	-

3.8 GREECE

3.8.1 Legislation

Date of last update of the table: 4 March 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Road Design Guidelines Manual*	O.M.O.E.				
1. Tunnels (civil works)	O.M.O.E. 8	19.2.03	Ministerial Decree	Cross section, lay-bys, emergency exits, etc.	Yes
2. Tunnels (electromechanical works)	O.M.O.E. 9	19.2.03	Ministerial Decree	Ventilation, lighting, safety equipment, etc.	Yes
3. Signing (including tunnels)	O.M.O.E. 6	Edition 2010	Ministerial Decree	Road signing, safety signing as escape routes, etc.	Yes
4. Road Work Zones Signage	O.M.O.E. 7	Edition 2010	Ministerial Decree		Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Motorway Maintenance Guidelines					
Tunnel Electromechanical Equipment Routine Maintenance Guidelines**		12.7.04	Ministerial Decree		Yes
Risk Analysis Methodology* **					
Risk analysis guidelines from transport of DGVs through road tunnels		Edition 2010	Approved by the Administrative Authority		Yes
Road tunnels risk analysis guidelines without involvement of DGVs		Edition 2010	Approved by the Administrative Authority		Yes
Safety Documents* **					
Content of tunnel safety documentation		Edition 2010	Under approval by the Administrative Authority		
Safety inspections of road tunnels		Edition 2010	Under approval by the Administrative Authority		

* O.M.O.E documents can be downloaded from the website of the General Secretariat of Public Works: http://www.ggde.gr.

** "Tunnel Electromechanical Equipment Routine Maintenance Guidelines" can be downloaded from the website: http://www.egnatia.eu/files/om_guidelines/HM.pdf .

*** "Risk analysis methodology" documents and "Safety documents" are not currently available on a website. These documents have been disclosed to Tunnel Managers and can be obtained from the Administrative Authority by sending a request to d13mele@otenet.gr

3.8.2 Recognised recommendations

Date of last update of the table: 4 March 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
-	-	-	-	-	-

3.9 HUNGARY

3.9.1 Legislation

Date of last update of the table:22 February 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
"Minimum safety requirements concerning tunnels existing on TERN routes on the territory of the Hungarian Republic" - Government Regulation Nº 18/2007(II.2.)	Government Regulation Nº 18/2007(II.2.)	2 Feb 2007	Government Regulation		Yes

3.9.2 Recognised recommendations

Date of last update of the table:22 February 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Road Technical Directive Nº ÚT-2.1.405:2008: Highway Tunnels General Specifications of Setting up - Ministry of Economy and Transport	Road Technical Directive Nº ÚT-2.1.405	2008	Approved directive	Based on design- execution- and first operational experiences further update	Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
				is in preparation	

3.10 ITALY

3.10.1 Legislation

Date of last update of the table: 20 April 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Circular on. Safety of Traffic in Road Tunnels with Particular Reference to Vehicles Transporting Dangerous Materials (Sicurezza della circolazione nelle gallerie stradali con particolare riferimento ai veicoli che trasportano materiali pericolosi) Ministero dei Lavori Pubblici (Ministry of Public Works)	Circ. 06.12.1999	6 Dec. 1999	Governmental circular	Covers transport of dangerous goods only	
Functional and geometrical standard for construction of roads (Norme funzionali e geometriche per la construzione della Strade) Ministerio della Infrastrutture e dei Transporti. Ispettorato Generale per la Circolazione e la Sicurezza Stradale. (Ministry of Infrastructure and transport. General Inspectorate for Traffic and Road Safety)	Norm 05.11.2001	5 Nov. 2001	Ministerial Decree	Only 4 pages deal with tunnels, showing tunnel cross section.	
Standards for the lighting of road tunnels		14 Sept. 2005	Ministerial Decree		Yes
		5 Oct. 2006	Legislative decree		Yes

3.10.2 Recognised recommendations

Date of last update of the table: 16/2/2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Guideline for the design of safety in road tunnels according to the norm in force, 2nd edition (Linee guida per la progettazione della sicurezza nelle gallerie stradali secondo la normativa vigente, seconda edizione) Issued by ANAS	Circolare CDG-0179431-P	9 Dec. 2009	ANAS circular		Yes
Geometric and functional characteristics of tunnels, 2nd edition (Caratteristiche geometriche e funzionali delle gallerie, seconda edizione) Issued by ANAS	Circolare CDG-0179456-P	9 Dec. 2009	ANAS circular		Yes

Both these documents can be downloaded from the ANAS website: www.stradeanas.it.

3.11 LUXEMBOURG

3.11.1 Legislation

Date of last update of the table: 22 February 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Loi concernant les exigences de sécurité minimales applicables à certains tunnels routiers et modifiant la loi modifiée du 15 mai 1974 portant réorganisation de l'Administration des ponts et chaussées	Loi du 21/11/2007 http://www.legilux.public.lu/leg/	21 Nov 2007	Law	Transposition of Directive 2004/54/EC	Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Law relating to the minimum safety requirements applicable to some road tunnels and modifying the modified law of 15 May 1974 which re-organised the “ponts et chaussées” administration	a/archives/2007/0209/a209.pdf				
Règlement grand-ducal relatif aux mesures de sécurité applicables dans certains tunnels routiers ainsi qu’à l’approbation des projets de tunnels, à l’établissement des dossiers de sécurité afférents, à la mise en service et aux modifications substantielles de structure des tunnels et aux exercices de sécurité périodiques National regulation relating to the safety measures applicable to some road tunnels as well to the approbation of tunnel designs, compilation of related safety documentation, commissioning and substantial modifications of tunnel structures, and periodic safety exercises	Règlement grand-ducal du 20/12/2007 http://www.legilux.public.lu/leg/a/archives/2007/0230/a230.pdf#page=2	20 Dec 2007	Regulation	Transposition of Directive 2004/54/EC	Yes
RABT (Richtlinien für die Ausstattung und den Betrieb von Strassentunneln) Guidelines for equipment and operation of road tunnels	RABT 2006	2006	Compulsory	German guideline applied in Luxembourg	Yes

3.11.2 Recognised recommendations

Date of last update of the table: 22 February 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
DIN and SIA			Not imposed Self decision	Used for the design and construction of a tunnel	

3.12 THE NETHERLANDS

3.12.1 Legislation

Date of last update of the table: 7 April 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
The Dutch Tunnel Law (WARVW- BARVW-RARVW)	www.overheid.nl www.rws.nl/kennisce ntrum/veiligheid/steun punt_tunnelveiligheid/	2006	Law Revision of the law will take place in 2011	For tunnels > 250 m	Yes
Guideline for Safety Documentation (in Dutch: Leidraad Veiligheidsdocumentatie)	ISBN 9789036900102 www.rws.nl/kennisce ntrum/veiligheid/steun punt_tunnelveiligheid/	2007	Decree		Yes
Guideline for Scenario Analysis, part 1 Road Tunnels (in Dutch: Leidraad Scenarioanalyse, deel 1 Wegtunnels)	ISBN 90–77374–03–5 COB J304–W–04–130 RWS 4818–2004–0103	2004	Decree		Yes
QRA model RWSQRA version 1.1	www.rws.nl/kennisce ntrum/veiligheid/steun punt_tunnelveiligheid/	2006	Decree	Version 2.0 is finalised	Yes

3.12.2 Recognised recommendations

Date of last update of the table: 7 April 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Recommendations on ventilation in Road Tunnels (in Dutch: Aanbevelingen ventilatie van verkeerstunnels, Steunpunt Tunnelveiligheid)	ISBN 90-369-0001-8	2005	Recommendation		Yes
Safety Guidelines Part C / Basic measures for Safety in Tunnels (Veiligheidsrichtlijnen Deel C / Basismaatregelen). Main Report and Appendixes (Centre for tunnel safety). Version 1.0	www.rws.nl/kennisce ntrum/veiligheid/steun punt_tunnelveiligheid/	2009	Guidelines for safety technical and operational features regarding state-owned tunnels.		Yes
Fire testing procedure for concrete tunnel linings	2008-Effectis-R0695	2008	Recommendation		Yes
Guideline for Risk Analysis (in Dutch: Handreiking Risicoanalyse Tunnelveiligheid)	www.rws.nl/kennisce ntrum/veiligheid/steun punt_tunnelveiligheid/	2006	Guideline		Yes
Recommendations on tunnel lighting (NSVV Aanbeveling 'Verlichting van tunnels en onderdoorgangen')	NSVV	2003	Recommendation		Yes
Road design in and around tunnels (Convergentie- en divergentiepunten in en nabij tunnels)	www.rws.nl/kennisce ntrum/veiligheid/steun punt_tunnelveiligheid/	2008	Recommendation		Yes
Specific Aspects Tunnel Design (SATO: specifieke aspecten tunnel ontwerp)	www.rws.nl/kennisce ntrum/veiligheid/steun punt_tunnelveiligheid/		Guideline		Yes

3.13 POLAND

3.13.1 Legislation

Date of last update of the table: 5 May 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Law on Public Roads	D.U nr 204 – 2086 (official journal)	2004	Law	Most of legislation was finished in 2008	Yes
Decree (D.U.2000 nr 63) – relating to technical requirements for highway structures and its localisation Ministry of Transport and Maritime Economy	Decree 2000 nr 63 - 735	2000	Decree	Legislation is currently in the final phase	Yes

3.13.2 Recognised recommendations

Date of last update of the table: 5 May 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Decree (D.U. 2008 nr 193) – regulation on tunnel safety documentation Ministry of Infrastructure	Decree 2008 nr 193 – 1192	2008	Decree		Yes

3.14 PORTUGAL

3.14.1 Legislation

Date of last update of the table: 6 July 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Decree Law of 27/03/2006		2006	Decree Law	Applies to all tunnels on national roads with a length equal or greater than 500 m	Yes
Low Voltage Electrical Energy Regulations (Regras Técnicas das Instalações Eléctricas de Baixa Tensão)	Portaria n.º 949-A/2006, de 11 de Setembro	2006	Decree	To be applied to all low voltage electric power installations in the tunnels	Yes
Fire Safety Technical Regulations for Buildings (Regulamento Técnico de Segurança Contra Incêndio em Edifícios)	Portaria n.º 1532/2008 de 29 de Dezembro	2008	Decree	Parts of it are being applied also to ventilation related electrical systems	Yes

3.14.2 Recognised recommendations

Date of last update of the table: 6 July 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
CIE 88: 2004 – Guide for the Lighting of Road Tunnels and Underpasses, Commission Internationale de l'Éclairage.	CIE 88:2004 http://div4.cie.co.at/?i_ca_id=587&pubid=133	2004	Technical guide	Followed in all road tunnels > 500m already built in Portugal	Yes

3.15 SLOVAKIA

3.15.1 Legislation

Date of last update of the table: 10 May 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Zákon č. 135/1961 Zb. o pozemných komunikáciách (cestný zákon) v znení neskorších predpisov; Law on road transports;	www.zbierka.sk	Change 144/2010 from 04.2010	law		yes
Zákon č. 50/1976 Zb. o územnom plánovaní a stavebnom poriadku (stavebný zákon) v znení neskorších predpisov, Law on Construction Works	www.zbierka.sk	Change 118/2010 from 07.2010	law		yes
Vyhláška MDPTSR č. 55/2008 Z.z. o projektovej dokumentácii stavieb diaľnic a ciest pre motorové vozidlá Decree on documentation of motorway designing	www.zbierka.sk	2008	decree		yes
Nariadenie vlády SR č. 344/2006 Z. z. o minimálnych bezpečnostných požiadavkách na tunely v cestnej sieti, Administration act on minimum safety requirements for tunnels in the Trans-European Road Network;	www.zbierka.sk	2006	administration act	Transposing the European directive into National legislation	yes
STN 73 7507 Projektovanie cestných tunelov, Technical standard for design of road tunnels	www.sutn.sk	2008	Slovakian technical standard	Tunnel cross section, Interior Construction, Structural safety measures, list of technological equipment,	Yes
STN 92 0201, Part: 1-4 Požiarna bezpečnosť stavieb. Technical standard for structural fire protection. Common regulations. Part 1-4	www.sutn.sk	2001	Slovakian technical standard		yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
TP 04/2006 Požiarna bezpečnosť cestných tunelov Guideline on road tunnel fire safety	www.ssc.sk	2006	Technical guideline	Includes recommendation on: structural fire safety, fire safety, safety and technological equipment, fire ventilation requirements Under revision. New version expected in 2011	yes
TP 09C1/2005 Prehliadky, údržba a opravy cestných komunikácií. Tunely - stavebné konštrukcie Road tunnel structures – inspections, maintenance and repairs	www.ssc.sk	2005	Technical guideline		yes
TP 09C2/2010 Prehliadky, údržba a opravy cestných komunikácií. Tunely – technologické vybavenie Road tunnel structures – inspections, maintenance and repairs	www.ssc.sk	2011	Technical guideline		yes
TS 1003 Dokumentácia tunelov; Tunnel documentation	www.ssc.sk	2003	Technical guideline		yes
TP 10/2005 Katalóg porúch tunelov na pozemných komunikáciách Road tunnels damage catalogue	www.ssc.sk	2005	Technical guideline		yes
TP 05/2006 Tunelové názvoslovie Tunnel terminology	www.ssc.sk	2006	Technical guideline		yes
TP 06-1/2006 Podzemné stavby. Časť 1: Cyklické razenie Underground constructions, Part 1 : Sequential excavation	www.ssc.sk	2006	Technical guideline	New version expected in 2011	yes
TP 06-2/2006 Podzemné stavby. Časť 2: Kontinuálne razenie	www.ssc.sk	2006	Technical	New version	yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Underground constructions, Part 2 : Cyclic excavation			guideline	expected in 2011	
TKP č.26 – Tunely. SSC, Technical and qualitative conditions for tunnels	www.ssc.sk	2004	Technical guideline		yes
V príprave: Technologické vybavenie tunelov Under preparation: Road tunnel equipment		2011	Technical guideline		No

3.15.2 Recognised recommendations

Date of last update of the table: 10 May 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
-	-	-	-	-	-

3.16 SLOVENIA

3.16.1 Legislation

Date of last update of the table: 21 February 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Zakon o javnih cestah (ZJC) Public roads act	http://zakonodaja.gov.si/rpsi/r06/predpis_ZAKO1366.html	1997 (appended in 2002,	law	from 01/07/2011 in force only some	Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
	UL RS 29/1997	2004, 2005, 2006, 2008, 2009)		articles	
Zakon o cestah (ZCes-1) Roads Act	http://zakonodaja.gov.si/rpsi/r08/predpis_ZAKO5788.html UL RS 109/2010	2010	law	Validity from 01/04/2011 Use from 01/07/2011	From 1st April 2011 Use from 1st July 2011
Uredba o tehničnih normativih in pogojih za projektiranje cestnih predorov v Republiki Sloveniji Decree on technical standards and requirements for road tunnel designing in the Republic of Slovenia	http://zakonodaja.gov.si/rpsi/r03/predpis_PRAV6453.html UL RS 48/2006	2006	decree	in force only for period till new adequate regulation will be issued upon new Roads Act if not in contradiction with new Roads Act	Yes
Uredba o spremembah Uredbe o tehničnih normativih in pogojih za projektiranje cestnih predorov v Republiki Sloveniji Decree amending the Decree on technical standards and requirements for road tunnel designing in the Republic of Slovenia	http://zakonodaja.gov.si/rpsi/r09/predpis_PRAV9369.html UL RS 54/2009	2009	decree	in force only for period till new adequate regulation will be issued upon new Roads Act if not in contradiction with new Roads Act	Yes
Pravilnik o prometni signalizaciji in prometni opremi na javnih cestah Rules on traffic signs and equipment on public roads	http://zakonodaja.gov.si/rpsi/r07/predpis_PRAV2547.html UL RS 46/2000 UL RS 110/2006	2000 (appended in 2006, 2008)	administration act	in force only for period till new adequate regulation will be issued upon new Roads Act if not in contradiction with new Roads Act	Yes

3.16.2 Recognised recommendations

Date of last update of the table: 21 February 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
-	-	-	-	-	-

3.17 SPAIN

3.17.1 Legislation

Date of last update of the table: 28 April 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Real Decreto 635/2006 on mínimum safety requirements for the road tunnels of the National Road State Network	RD 635/2006 http://www.fomento.gob.es/NR/rdonlyres/B862AC76-73ED-4937-BCBD-4F50ED485CFB/69724/09101000_2006.pdf	26/5/2006		The scope of this law goes beyond the scope of the Spanish TERN tunnels and the minimum requirements set by the Directive. It applies to all tunnels in the Spanish National Road Network.	Yes

3.17.2 Recognised recommendations

Date of last update of the table: 28 April 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Road Instruction, Norm, Alignment (Instrucción de Carreteras, Norma– Trazado) 3.1 IC [refers to all kind of roads and not specifically to tunnels]	Norma 3.1 http://www.fomento.es/NR/rdonlyres/7CDCD3E7-850A-4A9C-813D-B87FAEDE1A7A/55858/0510100.pdf	Dec. 1999		References to tunnels are only in section 5.2.3 (limiting slope), 7.4.1 (cross section) and 7.3.7 (minimum free height)	Yes
Road Instruction, Norm, Vertical signals (Instrucción de Carreteras, Norma - Señalización vertical) 8.1 IC [refers to signalling on roads]	Norma 8.1 http://www.boe.es/boe/dias/2000/01/29/pdfs/A04049-04106.pdf	Dec. 1999		Include different sections and references specific for tunnels (mainly in section 9.20)	Yes

3.18 SWEDEN

3.18.1 Legislation

Date of last update of the table: 9 March 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Plan- och bygglag Planning and Building Act	SFS 2010:900 http://www.notisum.se/Pub/Doc.aspx?url=/rnp/sls/lag/20100900.htm	2010-07-01	Law	In Swedish Valid for tunnels from 2011-05-02	Amendment in SFS 2010:1983
Lagen om skydd mot olyckor Civil Protection Act	SFS 2003:778 http://www.notisum.se/Pub/Doc.aspx?url=/rnp/sls/lag/20030778.htm	2003-11-20	Law	In Swedish	Yes, last amendment in SFS 2010:1908
Lagen om säkerhet i vägtunnlar Act on Road Tunnel Safety	SFS 2006:418 http://www.notisum.se/Pub/Doc.aspx?url=/rnp/sls/lag/20060418.htm	2006-05-24	Law	In Swedish	Yes, last amendment in SFS 2010:1573
Förordningen om tekniska egenskapskrav för byggnadsverk Decree on Technical Requirements for Construction Works	SFS 1994:1215 http://www.notisum.se/Pub/Doc.aspx?url=/rnp/sls/lag/19941215.htm	1994-08-25	Ordinance	In Swedish	Yes, last amendment in SFS 2010:132
Förordningen om skydd mot olyckor	SFS 2003:789	2003-11-20	Ordinance	In Swedish	Yes, last amendment

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Decree on Civil Protection	http://www.notisum.se/Pub/Doc.aspx?url=/rnp/sls/lag/20030789.htm				in SFS 2010:1724
Förordningen om säkerhet i vägtunnlar Decree on Road Tunnel Safety	SFS 2006:421 http://www.notisum.se/Pub/Doc.aspx?url=/rnp/sls/lag/20060421.htm	2006-05-24	Ordinance	In Swedish	Yes, last amendment in SFS 2010:1608
Föreskrifter och allmänna råd om säkerhet i vägtunnlar Regulations on Road Tunnel Safety	BFS 2007:11 BVT1 http://webtjanst.boverket.se/boverket/rattsinfoweb/vault/BVT/PDF/BFS2007-11BVT1.pdf	2007-05-28	Mandatory provisions and general recommendations	In Swedish	Yes, Amendment planned 2011

All SFS documents are available on the web by searching for "SFS xxxx:yy" or by using http://www.notisum.se/Pub/Default.aspx?pageid=288

3.18.2 Recognised recommendations

Date of last update of the table: 9 March 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Tunnel 2004 Swedish Transport Administration	VV Publ. 2004:124 http://publikationswebbutik.vv.se/upload/3803/2004_124_atb_tunnel_2004_komplett.	2004	Guideline. Internal regulation within the Swedish Transport	In Swedish	Yes Amendment planned

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
	pdf		Administration. (general tech. specification)		2011
The Design of Roads and Streets, VGU Swedish Transport Administration	VV Publ. 2004:80 Several documents, table of contents are available at http://www.trafikverket.se/Foretag/Bygga-och-underhalla/Vag/Utformning-av-vagar-och-gator/Vagar-och-gators-utformning/	2004	Guideline. Internal regulation within the Swedish Transport Administration and recommendation for the Swedish municipalities	In Swedish	Yes Amendment planned 2011
Personsäkerhet i vägtunnlar. Safety in Road Tunnels. Report from the National Board of Housing, Building and Planning, the Swedish Rescue Services Agency, Banverket and the Swedish Road Administration. Includes guidelines for risk analysies.	ISBN 91-7147-893-0 Report and 5 appendices are available at http://www.boverket.se/Om-Boverket/Webbokhandel/Publikationer/2005/Personsakerhet-i-tunnlar/	2005	Guideline	In Swedish	Yes
Sikkerhetskoncept 2004 for vegtunneler Safety concept 2004 for Road Tunnels Nordic Road Association	Report 3:2004 http://nvfnorden.org/lisalib/getfile.aspx?itemid=3858	2004	Advisory guideline	In Nordic languages	Yes
Road Tunnel Lighting	Report 4:1995 http://nvfnorden.org/lisalib/getfile.aspx?itemid=3860	1995	Advisory guideline	In English	Yes

3.19 UNITED KINGDOM

3.19.1 Legislation

Date of last update of the table: 20 June 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Design manual for roads and bridges, Volume 2 Highway structure design (substructures and special structures) materials, Section 2 : Special structures, Part 9, BD 78/99 :Design of road tunnels, 1999 Issued by the Highways Agency	BD 78/99	1999	Guideline and requirements issued by public authority for UK trunk road tunnels.	Typically also adopted by private and local authorities as guideline for non trunk road tunnels	Yes
The Road Tunnel Safety Regulations Published by The Stationary Office, UK	Statutory Instrument No. 1520	2007	Regulations	Applies to all tunnels over 500m in length that form part of the trans-European road network	Yes

3.19.2 Recognised recommendations

Date of last update of the table: 20 June 2011

Title / Issued by / Links	Reference (link)	Date	Administrative status	Comments	Still in use
-	-	-	-	-	-

4 LIST OF COLLECTED GUIDELINES (Other Countries)

4.1 AUSTRALIA

There are 8 legally independent jurisdictions within Australia that have the power to regulate Tunnel safety standards within their region. This is because Australia is a federation, and tunnels are not regulated by the central federal government.

As a result there is no mandatory Australian Tunnel standard nor is there any one set of governing legislation.

However, it has been recognised by each of the separate road administrations, and Australian tunnel experts that it is undesirable to have 8 differing standards within Australia.

As a result the joint road administrations have published a series of recomendations (AUSTROADS), and another organisation has published a set of recomendations (Australian Standards – AS).

Neither the Austroads standards nor the Australian Standards are mandated. The standards to be applied are a contractual matter on a project by project basis.

4.1.1 Legislation

Date of last update of the table: 16 March 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
No legislation in force					

4.1.2 Recognised recommendations

Date of last update of the table: 16 March 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Road Tunnel Design Guideline - Fire Safety Design / Roads and Traffic Authority, NSW	RTA/Pub. 06.357A	Nov 2006	Guideline for New South Wales Use (eg Sydney)	This document is in three parts which follow the concept, procurement and detailed design phases of a tunnel. Recommended fire safety measures as well as a fire engineering process to verify the adequacy of the chosen fire safety system is provided in the guidelines. This document is dated and is specific to the State Government of New South Wales	Limited
AFAC Fire Safety for Road Tunnels 2001	http://knowledgeweb.afac.com.au/positions/documents/FireSafetyGuidelinesforRoadTunnels.pdf	2001	Reference	An Australian Fire and Emergency Services Council publication which captures the approach taken to tunnel fires by emergency services in Australia late last century. In need of an update.	Limited
Guide to road tunnels: Introduction to Road Tunnels (Part 1) / AUSTROADS	https://www.onlinepublications.austroads.com.au/items/AGRT	2010	Persuasive	AUSTROADS represents the interests of all Australian states and territories road administrations, as well as the central government. This publication is intended to create a common minimum national position on tunnel standards	Yes
Guide to road tunnels : Planning, Design and Commissioning (Part 2) /	https://www.onlinepublications.au	2010	Persuasive	AUSTROADS represents the interests of all Australian states	Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
AUSTROADS	stroads.com.au/items/AGRT			and territories road administrations, as well as the central government. This publication is intended to create a common minimum national position on tunnel standards	
Guide to road tunnels : Operation and Maintenance (Part 3) / AUSTROADS	https://www.onlinepublications.au stroads.com.au/items/AGRT	2010	Persuasive	AUSTROADS represents the interests of all Australian states and territories road administrations, as well as the central government. This publication is intended to create a common minimum national position on tunnel standards	Yes
Tunnel fire safety - AS 4825-2011 / Australian Standards (First of anticipated series)	http://www.standards.org.au/ Tunnel Standards in preparation : http://www.sdpp.standards.org.au/ActiveProjects.aspx?CommitteeNumber=FP-023&CommitteeName=Tunnel%20Fire%20Safety	2011	Persuasive	Australian Standards ("AS") published the first of a series of tunnel standards. The AS standards are industry/private sector and stake holder based standards. AS standards are not mandatory. A Bus tunnel standard is anticipated: DR AS 4825.3 Tunnel fire safety Part 3 : Bus Tunnel	Yes

4.2 CANADA

4.2.1 Legislation

Date of last update of the table: 11 June 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Collection Normes – Ouvrages routiers **(Collection of Standards – Roads)** Lexique Tome I - Conception routière Tome II - Construction routière Tome III - Ouvrages d'art Tome IV - Abords de route Tome V - Signalisation routière - Volumes 1 et 2 *Volume V - Traffic Control Devices - Parts 1 & 2* Tome VI - Entretien Tome VII - Matériaux	Publication du Québec http://www3.publicationsduquebec.gouv.qc.ca/produits/ouvrage_routier.fr.html	2011	Code applicable in Quebec	Adopted in whole as a legal requirement in Quebec. Available only in French but for Volume V that has been translated to English	Yes
Collection Normes – Électrotechniques **(Collection of Standards – Equipment)** Manuel de conception d'un système d'éclairage routier Manuel de conception d'un système de signaux lumineux	Publication du Québec http://www3.publicationsduquebec.gouv.qc.ca/produits/ouvrage_routier.fr.html	2011	Code applicable in Quebec	Adopted in whole as a legal requirement in Quebec (available only in French)	Yes
Collection Normes – Structures **(Collection of Standards – Structures)** Manuel d'entretien des structures Manuel d'évaluation de la capacité portante des structures Manuel d'inspection des structures	Publication du Québec http://www3.publicationsduquebec.gouv.qc.ca/produits/ouvrage_routier.fr.html	2011	Code applicable in Quebec	Adopted in whole as a legal requirement in Quebec (available only in French)	Yes

4.2.2 Recognised recommendations

Date of last update of the table: 11 June 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Title: NFPA 502 Fire Protection. Standards for Road Tunnels, Bridges, and Other Limited Access Highways. **Issued by:** National Fire Protection Association (USA)	NFPA 502 www.nfpa.org	2011	Issued by National Fire Protection Association Standards Council and Approved as an American National Standard.	Adopted in whole or in part, at the discretion of the local jurisdictional authority.	Yes
Title: ASHRAE Handbook - Ch.15, Enclosed Vehicular Facilities. **Issued by:** American Society of Heating, Refrigeration and Air Conditioning Engineers – Technical Committee 5.9 (USA)	ASHRAE www.ashrae.org	2011	Handbook of HVAC Standards for enclosed vehicular facility applications	Adopted in whole or in part, at the discretion of the local jurisdictional authority.	Yes
Title: Tunnels en exploitation de l'état des lieux à l'état de référence **Issued by:** Centre d'Études des Tunnels (F)	CETU http://www.cetu.equipement.gouv.fr/securite-a574.html	2003	Recommandations	Adopted in whole or in part, at the discretion of the local jurisdictional authority.	Yes
Title: Les études spécifiques des dangers **Issued by:** Centre d'Études des Tunnels (F)	CETU http://www.cetu.equipement.gouv.fr/securite-a574.html	2003	Recommandations	Adopted in whole or in part, at the discretion of the local jurisdictional authority.	Yes
Title: Fire and Smoke Control in Road Tunnels **Issued by:** World Road Association	PIARC http://www.piarc.org/en	1999	Guideline	As referenced in NFPA 502. New edition pending.	Yes

4.3 CHINA

4.3.1 Legislation

Date of last update of the table: 9 March 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Code of design on building fire protection and prevention Ministry of Housing and Urban-Rural Development of the People's Republic of China (MOHURD) / General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China (AQSIQ)	GB50016-2006	July 2006	Law	Only for urban tunnel	Yes
Code for Design of Road Tunnel Ministry of Transport of the People's Republic of China(MOT)	JTG D70-2004	July 2004	Law		Yes
Code for Maintenance of Road Tunnel Ministry of Transport of the People's Republic of China (MOT)	JTG H12-2003	May 2003	Law		Yes

4.3.2 Recognised recommendations

Date of last update of the table: 9 March 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Guidelines for Design of Highway Tunnel Ministry of Transport of the People's Republic of China (MOT)	JTGTD70—2010	May 2010	Guideline		Yes
Design Specification for Traffic Engineering of Highway Tunnel Ministry of Transport of the People's Republic of China (MOT)	JTG/T D71-2004	Dec. 2004	Recommendation		Yes

4.4 CROATIA

4.4.1 Legislation

Legal procedure for design preparation is in short - through the Location permit of the Ministry of Internal Affairs, and its jurisdiction over the fire protection procedure, special construction requirements are defined, which are legally binding and applicable. In such cases usually application of the Austrian Guidelines RVS, dating from 2002, are recommended (since the valid regulations are outdated), thus considering the above mentioned, have a legal, compulsory application, value. In case that the requirements given in the Directive are stricter than the defined RVS, the Directive is applicable.

Therefore it would be very difficult to fill out a table which would define the actual state in this field in Croatia, since from the above given it is obvious that actually, the valid regulation is outdated and that, through other legally binding means, the Directive or the RVS are applicable.

Date of last update of the table: 2 April 2007

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Regarding the regulations tunnel designing, the valid document is the Book of Rules on technical standards for design preparation and construction of road tunnels	Official gazette no. 59/73.		Book of Rules on technical standards		
Law on Building (Official Gazette N° 175/03.) http://www.nn.hr/clanci/sluzbeno/2003/2552.htm Law on fire protection (Official gazette N°58/93,33/05) http://www.nn.hr/clanci/sluzbeno/1993/1161.htm Law on flammable liquids and gasses (Official gazette 108/95) http://www.nn.hr/clanci/sluzbeno/1995/1778.htm Law on transport of hazardous substances (Official gazette 97/93 AND 151/03) http://www.nn.hr/clanci/sluzbeno/1993/1889.htm	Off. Gaz N° 175/03 Off. Gaz. N°58/93,33/05 Off. Gaz. No. 108/95 Off. Gaz. 97/93 and 151/03		Laws	In general, System of fire protection in tunnels has been regulated in Croatian legislature with the mentioned Acts, which are valid for all structures, i.e. on the overall fire protection system.	Yes

4.4.2 Recognised recommendations

Date of last update of the table: 2 April 07

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
No document published					

4.5 JAPAN

4.5.1 Legislation

Date of last update of the table: 14 March 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
National Safety Standard of Emergency Facilities on Road Tunnel		April 1981	Governmental instruction	Written only in Japanese	Yes

4.5.2 Recognised recommendations

Date of last update of the table: 14 March 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Road Tunnel Technology in Japan Public Works Research Institute, Ministry of Construction	PWRI n°3023	Oct 1991	Technical Memorandum	This report shows the abstract of the technological standards applied to Japanese road	Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
				tunnels.	
State of the Road Tunnel Equipment Technology in Japan – Ventilation, Lighting, Safety Equipment Public Works Research Institute, Ministry of Construction	PWRI Vol. 61	Sept. 1993	Technical Note	This report shows the state of the road tunnel equipment technology in Japan.	
Expressway Standard Technical Specifications by NEXCO Tunnel Emergency Facilities Specification	Specification	July 2006	Expressway Standard Technical Specifications	A general approach and technical standards for construction and maintenance of tunnel emergency facilities for the NEXCO Written only in Japanese	Yes
Expressway Standard Technical Specifications by NEXCO Tunnel Ventilation Specification	Specification	July 2009	Expressway Standard Technical Specifications	A general approach and technical standards for construction and maintenance of tunnel ventilation facilities for the NEXCO Written only in Japanese	Yes

4.6 NORWAY

Further to an agreement with the European Union through the EFTA agreement, Norway applies Directive 2004/54/EC.

4.6.1 Legislation

Date of last update of the table: 7 March 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Brannvernlov med forskrifter (Fire prevention regulations)		2002	Legislation	Tunnels are especially mentioned in the regulations as an object that is covered by the regulation	Yes
Forskrift om minimum sikkerhetskrav til visse vegtunneler (Tunnelsikkerhetsforskriften)		15 May 2007	Legislation	A Norwegian adaption of the Eu-directive including some adjustments that apply to Norway	Yes

4.6.2 Recognised recommendations

Date of last update of the table: 7 March 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Norwegian design guide, Roads Tunnels Public Roads Administration, Directorate of Public Roads	Håndbok 021	Dec 2010	Guideline/ manual issued by public authority	The 2010 version is only in Norwegian	Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Guidance for risk analysis of road tunnels (Veiledning I risikoanalyser av vegtunneler)	Report No. TS 2007: 11	Oct 2007	Report /guidance	To be tested before it is published as a manual	Yes
Water and frost insulation in Tunnels (Vann og frostsikring i tunneler)	Håndbok 163	Oct 2006	Guideline	In Norwegian only	

4.7 SINGAPORE

4.7.1 Legislation

Date of last update of the table: 11 May 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
Road Traffic Act	http://statutes.agc.gov.sg/	2010	statute		Yes

4.7.2 Recognised recommendations

Date of last update of the table: 11/05/2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Title: NFPA 502 - Standards for Road Tunnels, Bridges, and Other Limited Access Highways. **Issued by**: National Fire Protection Association	www.nfpa.org	2011	Adopted as road tunnels fire safety standard in Singapore		Yes
Title: Design manual for roads and bridges, Volume 2 , Section2, Part 9, BD 78/99 :Design of Road Tunnels **Issued by** : The Highways Agency, United Kingdom	-	1999	Guideline		Yes
Title: Fire and Smoke Control in Road Tunnels **Issued by**: PIARC (World Road Association)	www.piarc.org	1999	Guideline		Yes
Title: Road Tunnels: Vehicle Emissions and Air Demand for Ventilation **Issued by**: PIARC (World Road Association)	www.piarc.org	2004	Guideline		Yes
Title: Civil Design Criteria for Road and Rail Transit Systems **Issued by:** Land Transport Authority, Singapore	-	2009	Engineering Standard	Updated Annually	Yes

4.8 SOUTH KOREA

4.8.1 Legislation

Date of last update of the table: 29 March 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
National Design & Management Standard of Emergency Facilities on Road Tunnel Ministry of Land, Transport and Maritime Affairs	www.mltm.go.kr	Aug. 2009	Governmental Instruction	Available only in Korean Established in 2004	Yes
Fire Safety Standard for Road tunnel National Emergency Management Agency	www.nema.go.kr	Jul. 2007	Governmental Instruction	Available only in Korean Established in 2007	Yes

4.8.2 Recognised recommendations

Date of last update of the table: 29 March 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
1. Design Guidelines for Road Tunnels #618(Tunnel Safety) Ministry of Land, Transport and Maritime Affairs	-	2010	Governmental Guideline	Available only in Korean	Yes
2. Design Standard for Expressway Tunnel Ventilation Korea Expressway Corporation	-	2002	Guideline by Public Authority	Available only in Korean Established in 1997	Yes
3. Design Standard for Emergency Facilities in Expressway Tunnels	-	2009	Guideline by Public Authority	Available only in Korean	Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Korea Expressway Corporation				Established in 1990	
4. Response Manual against Accidents in Expressway tunnels Korea Expressway Corporation	-	2011	Guideline by Public Authority	Available only in Korean Established in 2006	Yes

4.9 SWITZERLAND

4.9.1 Legislation

The Bilateral Agreements between Switzerland and the EU concluded in 1999 cover seven specific areas: the free movement of persons, the elimination of technical barriers to trade, public procurement markets, civil aviation, overland transport, agriculture and research. Further to the agreement in the overland transport area, Switzerland will apply Directive 2004/54/EC.
Date of last update of the table: 16 May 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
ASTRA 74 001 Exigences de sécurité applicables aux tunnels du réseau des routes nationales (2010 V1.01) (Safety requirements applicable to tunnels on the national road network)	1)	2010	Governmental Guidelines by the Federal Department of the Environment, Transport, Energy and Communications (DETEC)	Compulsory for all tunnels on the motorway network. Explains generally how the EU Directive 2004/54/CE will be applied in Switzerland. Available in French and German.	Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
ASTRA 13001 Ventilation des tunnels routiers (Ventilation of Road Tunnels)	2)	2008	Governmental Guidelines by the Federal Roads Office (FEDRO)	Compulsory for all tunnels on the motorway network. Available in French and German.	Yes
ASTRA 13002 Ventilation des galeries de sécurité des tunnels routiers (Ventilation of road tunnel safety galleries)	2)	2008	Governmental Guidelines by the Federal Roads Office (FEDRO)	Compulsory for all tunnels on the motorway network. Available in French and German.	Yes
ASTRA 13004 Détection des incendies dans les tunnels routiers (Fire detection in Road Tunnels)	2)	2008	Governmental Guidelines by the Federal Roads Office (FEDRO)	Compulsory for all tunnels on the motorway network. Available in French and German.	Yes
ASTRA 13007 Systèmes de radiocommunication dans les tunnels routiers (Radiocommunication Systems in Road Tunnels)	2)	2007	Governmental Guidelines by the Federal Roads Office (FEDRO)	Compulsory for all tunnels on the motorway network. Available in French and German.	Yes
ASTRA 13010 Signalisation des dispositifs de sécurité dans les tunnels (Signalisation of the Safety Devices in Tunnels)	2)	2011	Governmental Guidelines by the Federal Roads Office (FEDRO)	Compulsory for all tunnels on the motorway network. Available in French and German.	Yes
ASTRA 13011 Portes et portes carrossables des tunnels routiers (Doors and Drivable Doors in Road Tunnels)	2)	2009	Governmental Guidelines by the Federal Roads Office (FEDRO)	Compulsory for all tunnels on the motorway network. Available in French	Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
				and German.	

[1] ***http://www.astra.admin.ch/dienstleistungen/00129/00183/03189/index.html?lang=fr***

[2] *http://www.astra.admin.ch/dienstleistungen/00129/00183/index.html?lang=fr*

4.9.2 Recognised recommendations

Date of last update of the table: 16 May 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
SIA 197 Design of Tunnels - Basic Principles	Published by Swiss Society of Engineers and Architects*	2004	Code of the Swiss Standards Association.	Available in English, French and German.	Yes
SIA 197/2 Design of Tunnels - Road Tunnels	Published by Swiss Society of Engineers and Architects*	2004	Code of the Swiss Standards Association.	Available in English, French and German.	Yes

* The SIA recommendations can be bought on the website : http://www.sia.ch/f/

4.10 U.S.A.

4.10.1 Legislation

Date of last update of the table: 20 April 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in force
-	-	-	-	-	-

4.10.2 Recognised recommendations

Date of last update of the table: 20 April 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Title: NFPA 502 Fire Protection. Standards for Road Tunnels, Bridges, and Other Limited Access Highways. **Issued by:** National Fire Protection Association	NFPA 502 www.nfpa.org	2008	Issued by National Fire Protection Association Standards Council and Approved as an American National Standard.	Adoption as a legal regulation, in whole or in part, is at the discretion of the local jurisdictional authority wherein the road tunnel exists .	Yes
Title: ASHRAE Handbook HVAC Applications, Ch.13, Enclosed Vehicular Facilities. **Issued by:** American Society of Heating, Refrigeration and Air Conditioning Engineers – Technical Committee 5.9	ASHRAE TC 5.9 www.ashrae.org	2007	Handbook of HVAC Standards for enclosed vehicular facility applications	As referenced in NFPA 502.	Yes
Title: ITA Guidelines for Structural Fire Resistance for Road Tunnels **Issued by:** International Tunneling Association	ITA www.ita-aites.org	2004	Guideline	As referenced in NFPA 502.	Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Title: Fire and Smoke Control in Road Tunnels **Issued by:** World Road Association	PIARC www.piarc.org	1999	Guideline	As referenced in NFPA 502. New edition pending.	Yes
Prevention and Control of Highway Tunnel Fires	FHWA	1984	Report		Yes
Highway and Rail Transit Tunnel Maintenance and Rehabilitation Manual	FHWA http://www.fhwa.dot.gov/bridge/tunnel/maintman00.cfm	2005	Guideline		Yes
Highway and Rail Transit Tunnel Inspection Manual	FHWA http://www.fhwa.dot.gov/bridge/tunnel/inspectman00.cfm	2005	Guideline		Yes
Technical Design Manual for Design and Construction of Road Tunnels – Civil Elements	FHWA http://www.fhwa.dot.gov/bridge/tunnel/pubs/nhi09010/index.cfm		Guideline		Yes
Tunnel Operation, Maintenance, Inspection and Evaluation (TOMIE) manual	FHWA		Future guideline	Under development	Not yet
National Tunnel Inspection Standards	FHWA		Future standards	Under development: link to draft version	

5 LIST OF COLLECTED GUIDELINES (International organizations)

5.1 PIARC

5.1.1 Legislation

- PIARC is not in charge of legislation –

5.1.2 Recognised recommendations

More than 30 reports as well as a number of articles have been published since 1995 or are in preparation by the PIARC Technical Committee on Road Tunnel Operations (older documents are also available). They can be downloaded in English and French from the PIARC website (www.piarc.org, see "Virtual library"). A "PIARC tunnel manual" is under preparation and should be available online in September 2011: it will offer an overview of road tunnel issues and provide an easy access to the content of the aforementioned reports and articles. Below is a selection of the recommendations most relevant for road tunnel safety.

Date of last update of the table: 21 July 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Road safety in tunnels World-wide survey in order to update the data on road tunnel safety (studies on various structures, to allow the detailed analysis of problems related to breakdowns, accidents and fires and to draw more valuable information on design and operation of tunnels to be built).	05.04.B	1996	Technical report	Mostly outdated	Mostly, no
Fire and smoke control in road tunnels Among the possible risks, vehicle fires give rise to particular concern because they are not very rare events and their consequences might be far larger underground than in the open if no appropriate measures were taken. Also the important and continuous decrease in vehicle	05.05.B	1999	Technical report		Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
pollutant emissions has led to determine ventilation equipment by smoke control considerations in case of fire. This report provides the complete state-of-the-art prepared by the working group on "Fire and Smoke Control" of the PIARC Committee on Road Tunnels (C5). It is intended for all those who are interested in road tunnels design, construction, operation or safety. It gives them an overview, recommendations, as well as the background on the way to provide a reasonably efficient and cost-effective protection against fire and smoke in road tunnels and numerous literature references.					
Cross section geometry in uni-directionnal tunnels Work on this report started in 1998 after studying literature on accidents in tunnels and national design guides. The goal was to develop the principles for a safe and cost effective tunnel cross section taking into consideration signalling and traffic management requirements. This report mainly describes the arguments considered in various countries concerning the dimensions of the cross section that are essential for traffic in terms of capacity, congestion level and safety. Conclusions are drawn and recommendations are given.	05.11.B	2002	Technical report		Yes
Cross Section Design of Bidirectional Road Tunnels Work on this report started in September 2001 as a continuation of the work carried out between the years 1998 and 2001, which concluded with the report entitled CROSS SECTION GEOMETRY IN UNIDIRECTIONAL ROAD TUNNELS, published by PIARC in March 2001. This report shares the terminology and general approach of the previous document but adapts and extends it to cover tunnels with a single gallery and two directions of travel. The drafting of this report has involved examination of appropriate national standards and recommendations, as well as various documents of the PIARC and other international organisations that have recently come into being in response to the tragic accidents that have occurred in tunnels since 1999. The conclusions and recommendations of the report are based on common practice in various countries, as well as on the opinions of the experts on the PIARC Committee.	05.12.B	2004	Technical report		Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Good practice for the operation and maintenance of road tunnels. This report complements the report entitled "Reduction of operational cost of road tunnels" which was presented and published at the Kuala Lumpur Congress in 1999. Various aspects of the management and operation of tunnels are considered. A method for providing continuity of management of safety, throughout the life of a tunnel, is described together with issues requiring consideration. The components and value of a Tunnel Management System (TMS) for the operation and maintenance of a tunnel are described. Once the tunnel management systems have been established, the service and quality levels available to a user depends not only on the nature and level of service provided by the tunnel equipment but also on the way in which the equipment is operated by the tunnel staff. Good practices are described with regard to the engagement and training of the staff involved in these activities. Finally, for the occasions when significant maintenance or refurbishment work is necessary advice is provided on possible strategies for accommodating tunnel renovation.	05.13.B	2004	Technical report		Yes
Road Tunnels: Vehicle Emissions and Air Demand for Ventilation In 1990 and 1995 PIARC published the calculation methodology and the emission factors for road tunnel ventilation design. An update of the existing PIARC methodology was necessary, as the emission standards of the vehicles were becoming more stringent and hence the vehicles cleaner. The old version described the emission situation up to the year 1995. This document has been produced by working group 2 of the PIARC Technical Committee on Road Tunnel Operations in the framework of its activities between 2001 and 2003. Due to a steady tightening of emission laws for vehicles and changes in the risk assessment of a tunnel fire, some design data need constant updating. In this publication new design information and some references are given for sizing longitudinal and transverse ventilation systems.	05.14.B	2004	Technical report		Yes
Traffic incident management systems used in road tunnels This report mainly identifies incident detection and verification devices being used in tunnels to provide operators with the information required to implement response scenarios, devices and systems being used by	05.15.B	2003	Technical report		Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
operating agencies to respond to incidents, and communicate with motorists within the tunnel					
Systems and equipment for fire and smoke control in road tunnels. This report complements the PIARC report published in 1999 "Fire and Smoke Control in Road Tunnels". After a presentation of the basic principles of smoke and heat progress at the beginning of a fire, the report presents the safety concepts for tunnel fires. It draws the lessons from the fires which occurred in the Mont-Blanc, Tauern and Saint-Gothard tunnels. The role of transverse and longitudinal ventilation is presented. The question of emergencies exits and escape route is addressed in detail, from their design point of view but also regarding the methods for warning and guiding tunnel users. The latest technological advancements in automatic fire detection and suppression are presented and discussed. The report presents recommendations on the design criteria for the resistance to fire for road tunnel structures. The report reviews the topics that need to be considered regarding operational responsibilities for emergencies, in particular those relating to the response by emergency services. A detailed bibliography and technical appendices on various topics including smoke dampers supplement this report and makes it the authoritative reference document in the world on these issues.	05.16.B	2007	Technical report		Yes
Guide for organizing recruiting and training road tunnel operating staff This report has been produced by Working Group 1 (WG 1) "Tunnel Operation", for PIARC Technical Committee C3.3. Road Tunnel Operation. This report was developed through contributions from individual members of WG 1. The given recommendations have been reviewed by WG 1 and are commended to the reader as worthy of consideration for use in road tunnels. The service and quality levels available to the user obviously depend on the nature and performance of the installed equipment. It also depends	2007R04	2007	Technical report		Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
on how this equipment is operated by the tunnel staff. The tasks entrusted to the operating staff are of major importance. Therefore the people called to perform these duties must be well selected when recruited, well trained before starting their tasks and continually retrained throughout their career. After some specific definitions the present "Guide for organizing, recruiting and training road tunnel operating staff" defines the tasks to be carried out to operate a tunnel and the staff qualities required to do them. Then, some recommendations in the field of organization, recruitment and training are made in general terms without showing preference for one type of structure rather than another. The split of organizational responsibilities vary from country to country and can vary between tunnels within a country. Thus, tunnel management might be the responsibility of either a public body or a private company. This report provides advice that would be equally applicable to both public and private organizations. The WG 1 hopes that the contents of this report will help tunnel managers and help them improve the organization, the recruitment and the training of their staffs. However, it is noted that tunnel staff management is a dynamic process and changes will continue to occur in the future as new rules and working practices are established.					
Integrated approach to road tunnel safety This report proposes an integrated approach to road tunnel safety, which has been developed in co-operation with the European research projects SafeT and UPTUN. General principles and current perspectives on road tunnel safety are summarised, including practical tunnel project experience. An international survey through PIARC C3.3 members was carried out. An overview is given of current best practice in various countries.	2007R07	2007	Technical report		Yes
Risk analysis for road tunnels Risk analysis is an important tool which can be used to help improve and optimise the safety of road tunnels. Risk analysis is now explicitly required by the European Directive 2004/54/EC, on minimum safety	2008R02	2008	Technical report		Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
requirements for road tunnels in the Trans-European Road Network. The report summarises the worldwide application of risk analysis methodologies for road tunnels and provides details about the adopted methods, the concept of risk evaluation, the experience of practical application and the suitability of the methodologies, including: o Austrian tunnel risk model TuRisMo, o Dutch scenario analysis for road tunnels, o Dutch TUNPRIM model, o French specific hazard investigation, o Italian risk analysis for road tunnels, o OECD/PIARC DG QRA model (for dangerous goods transport through road tunnels). Recommendations are provided on the standardisation of some specific elements of risk analysis in road tunnels.					
Management of the operator - emergency teams interface in road tunnels The purpose of this report is to assist the owners, operators of tunnels and emergency services to coordinate their operations in order to improve the level of safety for users, staff members and emergency teams during serious tunnel fires and tunnel incidents. The first part presents the most relevant lessons learned from the more serious tunnel fires of the last decades. It explains the development of lorry fires and emphasizes the utmost importance of reducing the duration of all the precursor actions before the commencement of the intervention. The report demonstrates the necessity of concerted actions and dialogue between the owner, the operator and the emergency services from the tunnel design process to post incident analysis. The second part proposes recommendations for coordinated actions for better emergency preparedness and planning. The third section outlines recommendations for improvement to the preparation of the response to incidents and fires and sensible improvement to the level of safety for users, operator's staff and the	2008R03	2008	Technical report		Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
emergency services.					
Road Tunnels: An assessment of fixed fire fighting systems The report reviews: o the previous studies on this topic carried out by PIARC and the recent developments since the release of the PIARC report on this subject in 1999; o the lessons drawn from the past fires and holistic approach to fixed fire fighting systems (FFFS); o consideration of FFFS in the general framework of tunnel safety and study of their interaction with ventilation, o requirements related to FFFS. In addition, the report contains many bibliographical references, a description of the various FFFS and their operating costs, and an update on their use in ten countries.	2008R07	2008	Technical report		Yes
Urban road tunnels - Recommendations to managers and operating bodies for design, management, operation and maintenance Urban road tunnels are unique in terms of traffic characteristics (high volume, congestion during commuter periods, wide variety of vehicles, high percentage of buses, etc.), infrastructural design, difficulty of closing and urban environment. Recommendations are presented to managers and operating bodies not only for the operation of existing tunnels but also for the design, management, operation and maintenance of urban road tunnels. The recommendations for existing tunnels are aimed at traffic control, maintenance, intervention management, communication with road users and improvement of operation. For the design of a new urban tunnel or the refurbishment of an existing one, recommendations are presented to facilitate the management of urban traffic network, equipment reliability and durability and whole life	2008R15	2008	Technical report		Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
costing.					
Human factors and road tunnel safety regarding users This report aims to improve the understanding of user behaviour in road tunnels in both normal and critical situations and to provide recommendations for tunnel design and operation. After an introduction of the human decision process, the report presents observations of the behaviour of tunnel users in normal and critical situations. Facing these different situations, the minimum measures required by the European Union directive of April 2006 are discussed and additional measures are recommended. Proposals are made for harmonisation of safety equipment, signage and messages communicated to users. Finally, the report covers what can be expected in the future from Intelligent Transport Systems regarding improvement of safety in road tunnels.	2008R17	2008	Technical report		Yes
Tools for road tunnel safety management This report is dedicated to the basic tools needed for management and decision support on road tunnel safety issues. It defines the general demands on tunnel safety documentation, referring to each of the three different stages of a tunnel project: design-construction, commissioning, operation. An overview table and detailed checklists are given. It deals with collection of incidents and their analysis. The report defines the significance of incidents to be recorded and presents the basic data collection requirements, along with a variety of practical feedback from different countries and recent research projects databases. The report presents safety inspections as a tool to assess the current tunnel safety level whether within a legal framework or whether against an accepted level of risk. It presents an organisational scheme based on the EU Directive 2004/54/EC. The contents of a safety inspection are given along with a comprehensive roadmap with all the necessary steps and preparation needed to carry out a safety inspection.	2009R08	2009	Technical report		Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Road Tunnels: Operational strategies for ventilation During normal operation, ventilation, whether natural or mechanical, is required to provide a clean air environment and to prevent the accumulation of pollutants. During emergency operation, ventilation is needed to influence the flow of smoke. Smoke control plays a key role to increase the chances of survival for tunnel users experiencing a fire, in particular during the self-rescue phase. The report describes the various types of ventilation systems commonly used in tunnels and focuses on ventilation controlduring a fire. Itplaces emphasis on strategies for longitudinal ventilation and flow velocities in emergency mode to be implemented according to the type of tunnel, to the ventilation systems in place, and to the traffic level so as to optimize smoke management, and in particular prevent backlayering and maintain smoke stratification as long as possible.	2011R02	2011	Technical report		Yes
Recommendations for strategic road tunnel safety management			Technical report	To be published in 2011-2012	
Best Practice for road tunnel emergency exercises			Technical report	To be published in 2011-2012	
Recommendations on management of maintenance and technical inspection of road tunnels			Technical report	To be published in 2011-2012	
Life cycle aspects of electrical road tunnel equipment			Technical report	To be published in 2011-2012	
Current practice for risk evaluation in road tunnels			Technical report	To be published in 2011-2012	
Assessing and improving safety in existing road tunnels			Technical report	To be published in 2011-2012	
Recommendations regarding road tunnel drivers' training and information			Technical report	To be published in 2011-2012	

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Design Fire Characteristics for Road Tunnels			Technical report	To be published in 2011-2012	
PIARC design criteria for resistance to fire for road tunnel structures	RR324-064	2004	Article in Routes/Roads		Yes
Quantitative risk assessment model for dangerous goods transport through road tunnels Applications of the quantitative risk assessment model for dangerous goods transport in France, Austria and the UK.	RR329-086	2006	Article in Routes/Roads		Yes
Effects of pavement on fires in road tunnels	RR334-054	2007	Article in Routes/Roads		Yes

5.2 ITA

5.2.1 Legislation

- ITA is not in charge of legislation –

5.2.2 Recognised recommendations

Date of last update of the table: 21 July 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Guidelines for structural fire resistance of road tunnels		2004	Guidelines		Yes

5.3 NVF Nordic Road Association

5.3.1 Legislation

- NVF is not in charge of legislation –

5.3.2 Recognised recommendations

Date of last update of the table: 18 May 2011

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Ventilation av vägtunnlar (Ventilation of Road Tunnels)	NVF Sub Committee 61: Tunnels	Rep. No 6: 1993	Handbook describing best practices within the Nordic countries	In Swedish English translation published in 1995	Mainly yes.
Belysning af vejtunneler (Road Tunnel Lighting)	NVF Sub Committee 61: Tunnels	Rep. No 4: 1995	Handbook describing best practices within the Nordic countries	In Danish and in English	Yes
Drift og vedlikehold av tunneler (Operation and Maintenance of Road Tunnels)	NVF Sub Committee 61: Tunnels	Rep. No 7: 1996	Handbook describing best practices within the Nordic countries	In Danish, Norwegian, Swedish	Yes
Sikkerhetskoncept 2000 (Safety Concept 2000)	NVF Sub Committee 32: Tunnels	Rep. No 11: 2000	Handbook describing best practices within the Nordic countries	In Danish, Norwegian, Swedish	Yes
Sikkerhetskoncept 2004 for vegtunneler (Safety Concept 2004 for Road Tunnels)	NVF Sub Committee 32: Tunnels	Rep. No 3: 2004	Handbook describing best practices within the Nordic countries	In Danish, Norwegian, Swedish	Yes
Kledninger I tunnel (Inner lining solutions in road tunnels)	NVF Sub Committee 32: Tunnels	Rep. No 6: 2008	Handbook describing best practices within the Nordic countries	In Danish, Norwegian, Swedish	Yes

Title / Issued by	Reference (link)	Date	Administrative status	Comments	Still in use
Kvalitetsoptimering av tunnlar under drift (Quality optimizing of operation and safety in road tunnels)	NVF Sub Committee 32: Tunnels	Rep. No 7: 2008	Handbook describing best practices within the Nordic countries	In Danish and Swedish	Yes