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INLAND TRANSPORT COMMITTEE

Working Party on Road Transport

EUROPEAN AGREMENT ON MAIN INTERNATIONAL TRAFFIC ARTERIES (AGR)

Consolidated version

Note by the secretariat

1. This document is submitted in accordance with the terms of reference of SC.1 as set out in document TRANS/SC.1/377/Add.1, paragraphs 1(b) and (c) which foresee the definition of a coordinated plan for the construction and upgrading of roads of international importance (the international "E" network) in the ECE region, as well as the update of the appropriate legal instruments.

2. This document contains the consolidated version of the European Agreement on Main International Traffic Arteries (AGR) of 15 November 1975, the previous version of which was published in 2002 (document TRANS/SC.1/2002/3).

3. The text hereafter comprises the original Agreement (ECE/TRANS/16) as revised by Amendments 1 to 9, as well as all amendments brought to the Agreement and its Annexes I and II since 2002. The parts where modifications were brought since 2002 are indicated by a line in the margin. The punctual modifications introduced in these parts are additionally indicated in bold.

4. This consolidated version has a purely documentary value.

EUROPEAN AGREEMENT ON MAIN INTERNATIONAL TRAFFIC ARTERIES (AGR)

THE CONTRACTING PARTIES,

CONSCIOUS of the need to facilitate and develop international road traffic in Europe,

CONSIDERING that in order to strengthen relations between European countries it is essential to lay down a coordinated plan for the construction and development of roads adjusted to the requirements of future international traffic and the environment,

HAVE AGREED as follows:

Article 1

Definition and adoption of the international E-road network

The Contracting Parties adopt the proposed road network hereinafter referred to as "the international E-road network" and described in annex I to this Agreement, as a coordinated plan for the construction and development of roads of international importance which they intend to undertake within the framework of their national programmes.

Creation of a grid system of roads

Article 2

The international E-road network consists of a grid system of reference roads having a general north-south and west-east orientation; it includes also intermediate roads located between the reference roads and branch, link and connecting roads.

Construction and development of roads of the international E-road network

Article 3

The roads of the international E-road network as referred to in article 1 of this Agreement shall be brought into conformity with the provisions of annex II to this Agreement.

Signing of the roads of the international E-road network

Article 4

1. The roads of the international E-road network shall be identified and signed by means of the road sign described in annex III to this Agreement.

2. All signs used to designate E-roads, which are not in conformity with the provisions of this Agreement and its annexes shall be removed within three years from the date of entry into force of this Agreement for the State concerned, in accordance with article 6.

3. New road signs conforming to that described in annex III to this Agreement shall be placed on all roads of the international E-road network within four years from the date of entry into force of this Agreement for the State concerned, in accordance with article 6.

4. The provisions of this article shall not be subject to any limitations which may result from the national programmes referred to in article 1 of this Agreement.

Procedure for the signature of, and for becoming Party to, this Agreement

Article 5

1. This Agreement shall be open until 31 December 1976 for signature by States which are either Members of the United Nations Economic Commission for Europe or have been admitted to the Commission in a consultative capacity in conformity with paragraph 8 of the terms of reference of the Commission.

2. Those States may become Parties to this Agreement by:

(a) signature not subject to ratification, acceptance or approval

(b) signature subject to ratification, acceptance or approval, followed by ratification, acceptance or approval; or

(c) accession.

3. Ratification, acceptance, approval or accession shall be effected by the deposit of an instrument in good and due form with the Secretary-General of the United Nations.

Entry into force of this Agreement

Article 6

1. This Agreement shall enter into force 90 days after the date on which the Governments of eight States have either signed it not subject to ratification, acceptance or approval or have deposited an instrument of ratification, acceptance, approval or accession provided that one or more roads of the international E-road network link, in a continuous manner, the territories of at least four of the States which have so signed or which have deposited such an instrument. If this condition is not fulfilled, the Agreement shall enter into force 90 days after the date either of the signature not subject to ratification, acceptance or approval or of the deposit of the instrument of ratification, acceptance, approval or accession, whereby the said condition will be satisfied.

2. For each State which deposits its instruments of ratification, acceptance, approval or accession after the commencement of the period of 90 days specified in paragraph 1 of this article, the Agreement shall enter into force 90 days after the date of deposit of the said instrument.

3. Upon its entry into force, this Agreement shall terminate and replace in relations between the Contracting Parties the Declaration on the Construction of Main International Traffic Arteries signed at Geneva on 16 September 1950.

Article 7

Procedures for amending the main text of this Agreement

1. The main text of this Agreement may be amended by either of the procedures specified in this article.

2. (a) Upon the request of a Contracting Party, any amendment proposed by it to the main text of this Agreement shall be considered in the Working Party on Road Transport of the Economic Commission for Europe (ECE).

(b) If adopted by a two thirds majority of those present and voting and if such a majority includes a two thirds majority of the Contracting Parties present and voting, the amendment shall be communicated by the Secretary-General to all Contracting Parties for acceptance.

(c) If the amendment is accepted by two thirds of the Contracting Parties, the Secretary-General shall so notify all Contracting Parties and the amendment shall come into force 12 months after the date of such notification. The amendment shall come into force with respect to all Contracting Parties except those which, before it comes into force, make a declaration that they do not accept the amendment.

3. Upon the request of at least one third of the Contracting Parties, a conference to which the States referred to in article 5 shall be invited, shall be convened by the Secretary-General. The procedure specified in subparagraphs (a) and (b) of paragraph 2 of this article shall be applied in respect of any amendment submitted to the consideration of such a conference.

Article 8

Procedure for amending annex I to this Agreement

1. Annex I to this Agreement may be amended by the procedure specified in this article.

2. Upon the request of a Contracting Party, any amendment proposed by it to annex I to this Agreement shall be considered in the Working Party on Road Transport of the Economic Commission for Europe (ECE).

3. If adopted by the majority of those present and voting and if such majority includes the majority of the Contracting Parties present and voting, the amendment shall be communicated by the Secretary-General to the competent administrations of the Contracting Parties directly concerned. The following shall be considered Contracting Parties directly concerned:

(a) In the case of a new, or the modification of an existing class A international road, any Contracting Party whose territory is crossed by that road;

(b) In the case of a new, or the modification of an existing, class-B international road, any Contracting Party contiguous to the requesting country, whose territory is crossed by the class-A international road or roads with which the class-B international road, whether new or to be modified, is connected. Two Contracting Parties having in their respective territories the terminal points of a sea link on the class-A international road or roads specified above shall also be considered contiguous for the purposes of this paragraph.

4. Any proposed amendments communicated in accordance with paragraph 3 of this article shall be accepted if within a period of six months following the date of its communication none of the competent administrations of the Contracting Parties directly concerned notify the Secretary-General of their objection to the amendment. If the administration of a Contracting Party states that its national law obliges it to subordinate its agreement to the grant of a specific authorization or to the approval of a legislative body, the competent administration shall not be considered as having consented to the amendment to annex I to this Agreement, and the proposed amendment shall not be accepted, until such time as the said competent administration notifies the Secretary-General that it has obtained the required authorization or approval.

If such notification is not made within a period of 18 months following the date on which the proposed amendment was communicated to the said competent administration or if, within the period of six months specified above, the competent administration of a Contracting Party directly concerned expresses an objection to the proposed amendment, that amendment shall not be accepted

5. Any amendment accepted shall be communicated by the Secretary-General to all the Contracting Parties and shall come into force for all the Contracting Parties three months after the date of its communication.

Procedure for amending annexes II and III to this Agreement

Article 9

1. Annexes II and III to this Agreement may be amended by the procedure specified in this article.

2. Upon the request of a Contracting Party, any amendment proposed by it to annexes II and III to this Agreement shall be considered in the Working Party on Road Transport of the Economic Commission for Europe (ECE).

3. If adopted by the majority of those present and voting, and if such majority includes the majority of the Contracting Parties present and voting, the amendment shall be communicated by the Secretary-General to the competent administrations of all Contracting Parties for acceptance.

4. Such amendment shall be accepted if during a period of six months from the date of notification, less than one third of the competent administrations of the Contracting Parties notify the Secretary-General of their objection to the amendment.

5. Any amendment accepted shall be communicated by the Secretary-General to all Contracting Parties and shall come into force three months after the date of its communication **with respect to all Contracting Parties except those which, during the six-month period referred to in Article 9.4, make a declaration that they do not accept all or part of the amendment.**

Notification of the address of the administration to which proposed amendments to the annexes to this Agreement are to be communicated

Article 10

Each State shall, at the time of signing, ratifying, accepting, approving or acceding to this Agreement, inform the Secretary-General of the name and address of its administration to which proposed amendments to the annexes to this Agreement are to be communicated in conformity with articles 8 and 9 of this Agreement.

Denunciation and cessation of validity of this Agreement

Article 11

Any Contracting Party may denounce this Agreement by written notification addressed to the Secretary-General. The denunciation shall take effect one year after the date of receipt of the Secretary-General of such notification.

Termination of this Agreement

Article 12

This Agreement shall cease to be in force if the number of Contracting Parties is less than eight for any period of 12 consecutive months.

Settlement of disputes

Article 13

1. Any dispute between two or more Contracting Parties which relates to the interpretation or application of this Agreement and which the Parties in dispute are unable to settle by negotiation or other means of settlement shall be referred to arbitration if any of the Contracting Parties in dispute so requests and shall, to that end, be submitted to one or more arbitrators selected by mutual agreement between the Parties in dispute. If the Parties in dispute fail to agree on the choice of an arbitrator or arbitrators within three months after the request for arbitration, any of those Parties may request the Secretary-General of the United Nations to appoint a single arbitrator to whom the dispute shall be submitted for decision.

2. The award of the arbitrator or arbitrators appointed in accordance with paragraph 1 of this article shall be binding upon the Contracting Parties in dispute.

Limits to the application of this Agreement

Article 14

Nothing in this Agreement shall be construed as preventing a Contracting Party from taking such action, compatible with the provisions of the Charter of the United Nations and limited to the exigencies of the situation, as it considers necessary to its external or internal security.

Declaration concerning article 13 of this Agreement

Article 15

Any State may, at the time of signing this Agreement or of depositing its instrument of ratification, acceptance, approval or accession, declare that it does not consider itself bound by article 13 of this Agreement. Other Contracting Parties shall not be bound by article 13 with respect to any Contracting Party which has made such a declaration.

Notifications to Contracting Parties

Article 16

In addition to the declaration, notifications and communications provided for in articles 7, 8, 9 and 15 of this Agreement, the Secretary-General shall notify the Contracting Parties and the other States referred to in article 5 of the following:

(a) signatures, ratifications, acceptances, approvals and accessions under article 5;

(b) the dates of entry into force of this Agreement in accordance with article 6;

(c) the date of entry into force of amendments to this Agreement in accordance with article 7, paragraph 2 (c), article 8, paragraphs 4 and 5 and article 9;

(d) denunciations under article 11;

(e) the termination of this Agreement under article 12.

Deposit of this Agreement with the Secretary-General

Article 17

After 31 December 1976 the original of this Agreement shall be deposited with the Secretary-General of the United Nations, who shall send certified true copies to all the States referred to in article 5 of this Agreement.

IN WITNESS WHEREOF, the undersigned, being duly authorized thereto, have signed this Agreement.

DONE at Geneva, this fifteenth day of November one thousand nine hundred and seventy-five, in a single copy in the English, French and Russian languages, the three texts being equally authentic.

Annex I

INTERNATIONAL E-ROAD NETWORK

Explanatory notes

1. Reference roads and intermediate roads, called class-A roads, have two-digit numbers; branch, link and connecting roads, called class-B roads, have three-digit numbers.

2. North-south orientated reference roads have two-digit odd numbers terminating in the figure 5 and increasing from west to east. East-west orientated reference roads have two-digit even numbers terminating in the figure 0 and increasing from north to south. Intermediate roads have respectively two-digit odd and two-digit even numbers comprised within the numbers of the reference roads between which they are located. Class-B roads have three-digit numbers, the first digit being that of the nearest reference road to the north of the B-road concerned, and the second digit being that of the nearest reference road to the west of the B-road concerned; the third digit is a serial number.

3. North-south oriented class A roads located eastward from road E 99 have three-digit odd numbers from 101 to 129. Other rules mentioned in paragraph 2 above apply to these roads.

4. Branch, link and connecting roads located eastwards of E 101 have 3-digit numbers, beginning with 0, from 001 to 099.

LIST OF ROADS

A. MAIN ROADS

(1) West-east orientation

(a) Reference roads

E 10 Å - Narvik - Kiruna - Luleå

E 20: Shannon - Limerick - Portlaoise - Dublin ... Liverpool - Manchester – Bradford - Leeds - Hull ... Esbjerg - Kolding - Middelfart - **Odense** - Korsør-Køge - København - Malmö - Helsingborg - Halmstad - Göteborg - Orebro - Arboga - Eskilstuna - Södertälje - Stockholm ... Tallin - St. Petersburg.

E 30 Cork - Waterford - Wexford - Rosslare ... Fishguard - Swansea - Cardiff - Newport - Bristol - London - Colchester - Ipswich - Felixstowe ... Hoek van Holland - Den Haag - Gouda - Utrecht - Amersfoort - Oldenzaal - Osnabrück - Bad Oeynhausen - Hannover - Braunschweig - Magdeburg - Berlin - Świebodzin − Poznań − Łowicz - Warszawa - Brest - Minsk - Smolensk - Moskva - Rjazan - Penza - Samara - Ufa – Chelyabinsk – Kurgan – Ishim - Omsk

E 40 Calais - Oostende - Gent - Bruxelles - Liège - Aachen - Köln - Olpe - Giessen - Bad Hersfeld - Herleshausen - Eisenach - Erfurt - Gera - Chemnitz - Dresden - Görlitz - Legnica - Wroclaw - Opole - Gliwice - Kraków - Przemyśl - Lvov - Rovno - Zhitomir - Kiev - Kharkov - Rostov-ná-Donu - Lougansk - Volgograd - Astrakhan - Atyrau - Beineu - Kungrad - Nukus - Dasshaus - Buchara - Nawoy - Samarkand - Dihzak - Tashkent - Shymkent - **Taraz** - Bishkek - Almaty - Sary-Ozek - **Taldykorgan** - Ucharal - Taskesken - Ayaguz - Georgiyevka - Ust-Kamenogorsk - **Ridder**.

E 50 Brest - Rennes - Le Mans - Paris - Reims - Metz - Saarbrücken - Mannheim - Heilbronn - Nürnberg - Rozvadov - Plzeň - Praha - Jihlava - Brno - Trencin - Prešov - Košice - Vyšné Nemecké - Uzhgorod - Mukačevo - Stryei - Ternopol - Khmelnitski - Vinnitza - Uman - Kizovograd - Dnepropetrovsk - Donetsk - Rostov-ná-Donu - Armavir - Mineralijnie Vodi - Makhachkala

E 60 Brest - Nantes - Tours - Orléans - Courtenay - Beaune - Besançon - Belfort - Mulhouse - Basel - Zürich - Winterthur - St. Gallen - St. Margrethen - Lauterach - Feldkirch - Imst - Innsbruck - Wörgl - Rosenheim - Salzburg - Linz - Wien - Nickelsdorf - Mosonmagyaróvár - Győr - Budapest - Püspökladány - Oradea - Cluj Napoca - Turda - Tîrgu-Mureş - Braşov - Ploieşti - Bucureşti - Urziceni - Slobozia - Hârşova - Constanţa - **Agigea** … Poti - Samtredia - Khashuri - Tbilisi - Gandja - Evlak - Baku ... urkmenbashi - Gyzylarbat - Ashgabat - Tedjen - Mary - Chardzhu - Alat - Buchara - Karshi - Guzai - Sherobod - Termis - Dushanbe - Jirgatal - Sary Tash - Irkeshtam.

E 70 La Coruña - Oviedo - Bilbao - San Sebastián - Bordeaux - Clermont-Ferrand - Lyon - Chambéry - Susa - Torino - Alessándria - Tortona - Brescia - Verona - Mestre (Venezia) - Palmanova - Trieste - Ljubljana - Zagreb - Djakovo - Beograd - Vršac - Timişoara − Caranşebeş − Drobeta Turnu Severan − Craiova − Alexandria− Bucureşti − Giurgiu − Ruse − Razgrad − **S**houmen − Varna ... Samsun − Ordu − Giresun − Trabzon − Batumi − Poti

E 80 Lisboa - Santarem - Leiria - Coimbra - Aveiro (Albergaria) - Viseu - Guarda - Vilar - Formoso - Salamanca - Burgos - San Sebastián - Pau - Toulouse - Narbonne - Nîmes - Aix-en-Provence - Nice - Vintimiglia - Savona - Genova - La Spezia - Migliarino - Livorno - Grosseto - Civitavecchia - Roma - Pescara ... Dubrovnik - Petrovac - Podgorica - Priština - Niš - Dimitrovgrad - Sofia - Plovdiv - Svilengrad - Edirne - Babaeski - Silivri - Istanbul - Izmir - Adapazari - Bolu - Gerede - Ilgaz - Amasya - Niksar - Refahiye - Erzincan - Askale - Erzurum - Ağri - Gürbulak - Iran (Islamic Republic of)

E 90 Lisboa - Montijo - Setúbal - Evora - Caia - Badajoz - Madrid - Zaragoza - Lérida - Barcelona ... Mazara del Vallo - Alcamo - Palermo - Buonfornello Messina ... Reggio di Calabria - Catanzaro - Crotone - Sibari - Metaponto - Taranto - Brindisi ... Igoumenitsa - Ioannina - Kozani - Thessaloniki - Alexandropouli - Ipsala - Kesan - Gelibolu ... Lapseki - Bursa - Eskişehir - Sivrihisar - Ankara - Aksaray - Adana - Toprakkale - Gaziantep - S. Urfa - Nusaybin - Cizre - Habur - Iraq

(b) Intermediate roads

E 04 Helsingborg - Jönköping - Norrköping - Södertälje - Stockholm - Sundsvall - Umeå - Luleå - Haparanda - Tornio

E 06 Trelleborg - Malmö - Halmstad - Göteborg - Oslo - Lillehammer - Trondheim - Narvik - Olderfjord - Karasjok - Kirkenes

E 08 Tromsø - Nordkjosbotn - Skibotn - Kilpisjärvi - Tornio - Oulu - Vaasa - Turku

E 12 Mo i Rana - Umeå ... Vaasa - Tampere - Helsinki

E 14 Trondheim - Storlien - **Ö**stersund - Sundsvall

E 16 Londonderry - Belfast ... Glasgow - Edinburgh ... Bergen - Fagernes - Oslo

E 18 Craigavon - Belfast - Larne ... Stranraer - Gretna -Carlisle - Newcastle ... Kristiansand - Oslo - Örebro - Arboga - Västerås - Stockholm/Kapellskär ... Mariehamn ... Turku/Naantali - Helsinki - Vaalimaa - St. Petersburg

E 22 Holyhead - Chester - Warrington - Manchester - Leeds - Doncaster - Immingham … Amsterdam - Gronningen - Oldenburg - Bremen - Hamburg - Lübeck - Rostock - Stralsund - Sassnitz … Trellenborg - Malmö - Kalmar - Norköping … Ventspils - Riga - Rezekne - Velikie Luki - Moskva - Vladimir - Nizhny Novgorod - **Kazan - Elabuga - Perm - Ekaterinburg - Tyumen - Ishim**

E 24 Birmingham - Cambridge - Ipswich

E 26 Hamburg - Berlin

E 28 Berlin - Szczecin - Goleniów - Koszalin - Gdańsk ... Kaliningrad - Tolpaki - Nesterov - Marijampole - Vilnius - Minsk

E 32 Colchester - Harwich

E 34 Zeebrugge - Antwerpen - Eindhoven - Venlo - Oberhausen - Dortmund - Bad Oeynhausen

E 36 Berlin - Lübbenau - Cottbus - Legnica

E 38 Glukhov - Kursk - Voronezh - Saratov - Uralsk - Aktobe - Karabutak - Aralsk - Novokazalinsk - Kzylorda - **Shymkent**.

E 42 Dunkerque - Lille - Mons - Charleroi - Namur - Liège - St. Vith - Wittlich - Bingen - Wiesbaden - Frankfurt am Main - Aschaffenburg

E 44 Le Havre - Amiens - Charleville-Mézières - Luxembourg - Trier - Koblenz - Giessen

E 46 Cherbourg - Caen - Rouen - Reims - Charleville-Mézières - Liège

E 48 Schweinfurt - Bayreuth - Marktredwitz - Cheb - Karlovy Vary - Praha

E 52 Strasbourg - Appenweier - Karlsruhe - Stuttgard - Ulm - München - Salzburg

E 54 Paris - Chaumont - Mulhouse - Basel - Waldshut - Lindau - München

E 56 Nürnberg - Regensburg - Passau - Wels - Sattledt

E 58 Wien - Bratislava - Zvolen - Košice - Uzhgorod - Mukacevo - Halmeu - Suceava - Iasi - **Sculeni** - Kishinev - Odessa - Nikolaev - Kherson - Melitopol - Tagonrog - Rostov-na-Donu

E 62 Nantes - Poitiers - Mâcon - Genève - Lausanne - Martigny - Sion - Simplon - Gravellona Toce - Milano - Tortona - Genova

E 64 Torino - Milano - Brescia

E 66 Fortezza - St. Candido - Spittal - Villach - Klagenfurt - Graz - Veszprém - Székesfehérvár

E 68 Szeged - Arad - **Ilia** - Deva - **Sebeş** - Sibiu - **Veştem** - **Făgăraş** - Braşov.

E 72 Bordeaux - Toulouse

E 74 Nice - Cuneo - Asti - Alessandria

E 76 Migliarino - Firenze

E 78 Grosseto - Arezzo - Sansepolcro - Fano

E 82 Porto - Vila Real - Bragança - Zamora - Tordesillas

E 84 Kesan - Tekirdag - Silivri

E 86 Krystalopigi - Florina - Vevi - Yefira

E 88 **Ankara** - **Yozgat** - **Sivas** - **Refahiye**

E 92 Igoumenitsa - Joannina - Trikala - Volos

E 94 Corinthos - Athinai

E 96 **Izmir** - **Uşak** - **Afyon** - **Sivrihisar**

E 98 Topbogazi - Kirikhan - Reyhanli - Cilvegözü - Syrian Arab Republic

(2) **North-south orientation**

(a) Reference roads

E 05 Greenock - Glasgow - Gretna - Carlisle - Penrith - Preston - Warrington - Birmingham - Newbury - Southampton ... Le Havre - Paris - Orléans - Tours - Poitiers - Bordeaux - San Sebastián - Burgos - Madrid - Cordóba - Sevilla - Cádiz - Algeciras

E 15 Inverness - Perth - Edinburgh - Newcastle - Scotch-Corner - Doncaster - London - Folkestone - Dover ... Calais - Paris - Lyon - Orange - Narbonne - Gerona - Barcelona - Tarragona - Castellón de la Plana - Valencia - Alicante - Murcia - Algeciras

E 25 Hoek van Holland - Rotterdam - Gouda - Utrecht - 's-Hertogenbosch - Eindhoven - Maastricht - Liège - Bastogne - Arlon - Luxembourg - Metz - St. Avold - Strasbourg - Mulhouse - Basel - Olten - Bern - Lausanne - Genève - Mont-Blanc - Aosta - Ivrea - Vercelli - Allessandria - Genova ... Bastia - Porto Vecchio - Bonifacio ... Porto Torres - Sassari - Cagliari ... Palermo

E 35 Amsterdam - Utrecht - Arnhem - Emmerich - Oberhausen - Köln - Frankfurt am Main - Heidelberg - Karlsruhe - Offenburg - Basel - Olten - Luzern - Altdorf - S. Gottardo - Bellinzona - Lugano - Chiasso - Como - Milano - Piacenza - Parma - Modena - Firenze - Arezzo - Roma

E 45 **Karesuando** - **Gällivare** - **Storuman** - **Östersund** - **Mora** - **Grums** - **Trollhättan** - Göteborg … Frederikshavn - Aalborg - Århus - Vejle - Kolding - Frøslev - Flensburg - Hamburg - Hannover - Göttingen - Kassel - Fulda - Würzburg - Nürnberg - München - Rosenheim - Wörgl - Innsbruck - Brenner-Pass/Passo del Brennero - Fortezza - Bolzano - Trento - Verona - Modena - Bologna - Cesena - Perugia - Fiano (Roma) - S. Cesareo (Roma) - Napoli - Salerno - Sicignano - Cosenza - Villa S. Giovanni ... Messina - Catània - Siracusa - Gela

E 55 Helsingborg ... Helsingør - København - Koge - Vordingborg - Farø - Nykøbing Falster - Gedser ... Rostock - Berlin - Lübbenau - Dresden - Teplice - Praha - Tábor - České Budějovice − Dolní Dvořiště - Linz - Salzburg - Villach - Tarvisio - Udine - Palmanova - Mestre (Venezia) - Ravenna - Cesena - Rimini - Fano - Ancona - Pescara - Canosa - Bari - Brindisi ... Igoumenitsa - Preveza - Messolongi - Rion - Patrai - Pyrgos - Kalamata

E 65 Malmö - Ystad ... Świnoujście - Wolin - Goleniów - Szczecin - Świebodzin - Jelenia-Góra - Harrachov - Zelezný Brod - Turnov - Mladá Boleslav - Praha - Jihlava - Brno - Břeclav - Bratislava - Rajka - Mosonmagyaróvaŕ - Csorna - Szombathely - Körmend - Zalaegerszeg - Nagykanizsa - Letenye - Zagreb - Karlovac - Rijeka - Split - Metković - Dubrovnik - Petrovac - Podgorica - Bijelo Polje - Skopje - Kicevo - Ohrid - Bitolj - Niki - Vevi - Kozani - Lárissa - Domokos - Lamia - Brallos - Itea - Antirrion ... Rion - Egion - Korinthos - Tripoli - Kalamata ... Kissamos - Chania

E 75 Vardø - Utsjoki - Ivalo - Sodankylä - Rovaniemi - Kemi - Oulu - Jyväskylä - Lahti - Helsinki ... Gdańsk - Świecie - Krośniewice - Lódź - Piotrków Trybunalski - Katowice - Č. Těšin - Žilina - Bratislava - Györ - Budapest - Szeged - Beograd - Niš - Kumanovo - Skopje - Gevgelija - Evzoni - Thessaloniki - Lárissa - Almyros - Lamia - Athinai ... Chania - Iraklion - Agios Nikolaos - Sitia

E 85 Klaipéda - Kaunas - Vilnius - Lida - Slonim - Kobrin - Luck - Černovcy - Siret - Suceava - **Săbăoani** - Roman - Bačau - Mărăşeşti - **Tişiţa** - Buzău - Urziceni - Bucureşti - Giurgiu - Ruse - Bjala - Veliko Tarnovo - Stara Zagora - Haskovo - Svilengrad - Ormenio - Kastanies - Didymoteicho - Alexandropouli.

E 95 Sankt Petersburg -Pskov - Gomel - Kiev - Odessa ... Samsun - Merzifon

E 101 Moskva - Kaluga - Brjansk - Glukhov - Kiev

E 105 Kirkenes - Murmansk - Petrozavodsk - Sankt Petersburg - Moskva - Orel - Kharkov - Simferopol - Alushta - Yalta

E 115 Yaroslavl - Moskva - Voronezh - Rostov-na-Donu- Krasnodar - Novorossijsk

E 117 Mineraljnie Vodi - Naljchik - Vladikavkaz - Tbilisi - Yerevan - Goris - Megri

E 119 Moskva - Tambov - Povorino - Volgograd - Astrakhan - Makhachkala - Kuba - Baku - Alyat - Astara

E 121 Samara - Uralsk - Atyrau - Beineu - Shetpe - Zhetybai - Fetisovo - Bekdash - Turkmenbashi - Gyzylarbat - Border of Iran (Islamic Republic of)

E 123 Chelyabinsk - **Kostanay** - **Zapadnoe** - **Buzuluk** - **Derzhavinsk** - Arkalyk - Zhezkazgan - Kyzylorda - Shymkent - Tashkent - Aini - Dushanbe - Nizhny Pyanj

E 125 **Ishim** - Petropavlovsk - Kokshetau - **Shchuchinsk** - Astana - Karagandy - Balkhash - Burubaytal - Almaty - Bishkek - Naryn - Torugart

E 127 Omsk - Pavlodar - Semipalatinsk - Georgiyevka - Maikapshagai

(b) Intermediate roads

E 01 Larne -Belfast - Dublin - Wexford - Rosslare ... La Coruña - Pontevedra - Valença - Porto - Aveiro (Albergaria) - Coimbra - Lisboa - Setúbal - Faro - Vila Real de Santo António - Huelva - **S**eville

E 03 Cherbourg - Rennes - Nantes - La Rochelle

E 07 Pau - Jaça - Huesca - Zaragoza

E 09 Orléans - Limoges - Toulouse - Barcelona

E 11 Vierzon - Montluçon - Clermont Ferrand - Montpellier

E 13 Doncaster - Sheffield - Nottingham - Leicester - Northampton - London

E 17 Antwerpen - Gent - Kortrijk - Cambrai - Reims - Beaune

E 19 Amsterdam - Den Haag - Rotterdam - Breda - Antwerpen - Bruxelles - Mons - Valenciennes - Paris

E 21 Metz - Nancy - Dijon - Genève

E 23 Metz - Nancy - Besançon - Vallorbe - Lausanne

E 27 Belfort - Bern - Martigny - Grand-Saint-Bernard - Aosta

E 29 Köln - Luxembourg - Saarbrücken - Sarreguemines (E 25 Strasbourg)

E 31 Rotterdam - Gorinchem - Nijmegen - Goch - Krefeld - Köln - Koblenz - Bingen - Ludwigshafen

E 33 Parma - La Spezia

E 37 Bremen - Osnabrück - Dortmund - Köln

E 39 Trondheim - Ålesund - Bergen - Stavanger - Kristiansand ... Hirtshals - Hjørring - Nørre - Sundby - Aalborg

E 41 Dortmund - Giessen - Aschaffenburg - Würzburg - Stuttgart - Schaffhausen - Winterthur - Zürich - Altdorf

E 43 Würzburg - Ulm - Lindau - Bregenz - St. Margrethen - Buchs - Chur - S. Bernardino - Bellinzona

E 47 Helsingborg ... Helsingør - København - Køge - Vordingborg - Farø - Rodby ... Lübeck

E 49 Magdeburg - Halle - Plauen - Schönberg - Vojtanov - Karlovy Vary - Plzeň - České Budějovice - Třeboň - Halámky - Wien

E 51 Berlin - Leipzig - Gera - Hirschberg - Hof - Bayreuth - Nürnberg

E 53 Plzeň - Bayer - Eisenstein - Deggendorf - München

E 57 Sattledt - Liezen - St. Michael - Graz - Maribor – Ljubljan

E 59 Praha - Jihlava - Wien - Graz - Spielfeld - Maribor - Zagreb

E 61 Villach - Karawanken Tunnel/Predor Karavanke - Naklo - Ljubljana - Trieste - Rijeka

E 63 Sodankylä - Kemijärvi - Kuusamo - Kajaani - Kuopio - Jyväskylä - Tampere - Turku

E 67 Helsinki − Tallinn − Riga − Panevėžys − Kaunas − Warszawa − Piotrków Trybunalski − Wrocław − Kłodzko − Běloves − Náchod − Hradec Kralové − Praha

E 69 Nordkapp - Olderfjord

E 71 Košice - Miskolc - Budapest - Balatonaliga - Nagykanizsa - Zagreb - Karlovac - Bihać - Knin - Split

E 73 Budapest - Szekszárd - Mohács - Osijek - Djakovo - Samak - Zenica - Mostar - Metković

E 77 Pskov - Riga - Siauliai - Tolpaki - Kaliningrad ... Gdańsk - Elblag - Warszawa - Radom - Kraków - Trstená - Ružomberok - Zvolen - Budapest

E 79 Miskolc - Debrecen - **Berettyóújfalu** - Oradea - Beius - Deva - Petrosani - Tirgu Jiu - Craiova - Calafat - Vidin - Vraca - Botevgrad - Sofia - Blogojevgrad - Serai - Thessaloniki

E 81 Mukacevo - Halmeu - Satu Mare - Zalău - Cluj Napoca - Turda - Sebeş - Sibiu - Piteşti - Bucureşti - **Lehliu** - **Feteşti** - **Cernavodă** - **Constanța**.

E 83 Bjala - Pleven - Jablanica - Botevgrad - Sofia

E 87 Odessa - Izmail - Reni - Galati - Tulcea - Constanta - Varna - Burgas - **Marinka** - **Zvezdec** - Malko Tarnovo - Dereköy - Kirklareli - Babaeski - Havza - Keşan - Gelibolu - Eceabat … Çanakkale - Ayvalik - Izmir - Selçuk - Aydin - Denizli - Acipayam - Korkuteli - Antalya

E 89 Gerede - Kizilcahamam - Ankara

E 91 Toprakkale - Iskenderun - Topboğazi - Antakya - Yayladağ - Syrian Arab Republic

E 97 Kherson - Djankoy - Novorossi**j**sk - Sotchi - Sukhumi – Poti - ***(missing link)*** - **Trabzon** - **Gümüşhane** - **Aşkale**

E 99 **Şanliurfa - Diyarbakir - Bitlis - Doğubeyazit - Iğdir - Dilucu - Sadarak**.

B. BRANCH, LINK AND CONNECTING ROADS

E 134 Haugesund - Haukeligrend - Drammen

E 136 Ålesund - Andalsnes - Dombås

E 201 Cork - Portlaoise

E 231 Amsterdam - Amersfoort

E 232 Amersfoort - Hoogeveen - Groningen

E 233 Hoogeveen - Haselüne - Cloppenburg - Bremen

E 234 Cuxhaven - Bremerhaven - Bremen - Walsrode

E 251 Sassnitz - Stralsund - Neubrandenburg - Berlin

E 261 Świecie - Poznaň - Wrocław

E 262 Kaunas - Ukmerge - Daugavpils - Rezekne - Ostrov

E 263 **Tallinn - Tartu - Luhamaa**

E 264 **Jõhvi - Tartu - Valga - Valka - Valmiera - Incukalns**

E 271 Minsk - Gomel

E 272 Klaipéda - Palanga - Siauliai - Panevéñys - Ukmergé - Vilnius

E 311 Breda - Gorinchem - Utrecht

E 312 Vlissingen - Breda - Eindhoven

E 313 Antwerpen - Liège

E 314 Leuven - Hasselt - Heerlen - Aachen

E 331 Dortmund - Kassel

E 371 Radom - Rzeszów - Barwinek - Vyšný Komárnik - Svidnik - Prešov

E 372 Warszawa - Lublin - Lvov

E 373 Lublin - Kovel - Kiev

E 381 *(deleted)*

E 391 Trosna - Glukhkov

E 401 St. Brieuc - Caen

E 402 Calais - Rouen - Le Mans

E 403 Zeebrugge - Brugge - Kortrijk - Tournai

E 404 Jabbeke - Zeebrugge

E 411 Bruxelles - Namur - Arlon - Longwy - Metz

E 420 Nivelles - Charleroi - Reims

E 421 Aachen - St. Vith - Luxembourg

E 422 Trier - Saarbrücken

E 429 Tournai - Halle

E 441 Chemnitz - Plauen - **Hof**

E 442 Karlovy Vary - Teplice - Turnov - Hradec Králové - Olomouc - Žilina

E 451 Giessen - Frankfurt am Main - Mannheim

E 461 Svitavy - Brno - Wien

E 462 Brno - Olomouc - Česky Těšin - Kraków

E 471 Mukačevo - Lvov

E 501 Le Mans - Angers

E 502 Le Mans - Tours

E 511 Courtenay (A6) - Troyes

E 512 Remiremont - Mulhouse

E 531 Offenburg - Donaueschingen

E 532 Memmingen - Füssen

E 533 München - Garmisch-Partenkirchen - Mittenwald - Seefeld - Innsbruck

E 551 České Budějovice - Humpolec

E 552 München - Braunau - Wels - Linz

E 571 Bratislava - Zvolen - Košice

E 572 Trencin - Žiar nad Hronom

E 573 Püspökladány - Nyiregyháza - Tchop - Uzhgorod

E 574 Bacău − Braşov − Piteşti − Craiova

E 575 Bratislava - Dunajská Streda - Medvedov - Vámószabadi - Györ

E 576 Cluj Napoca – Dej

E 577 **Ploieşti** - **Buzău**

E 578 Saratel – Reghin – Toplita – Gheorgheni – Miercurea Ciuc – Sfantu – Gheorghe - Chichis

E 581 **Tişiţa** - Tecuci - Albiţa - Leucheni - Kishinev - Odessa

E 583 **Săbăoani** - Iaşi - Sculeni - Beltzy - Mohelerpodolsc - Vinnitza – Zhitomir

E 584 Poltava - Kirovgrad - Kishinev - Giurgiulesti - Galati - Slobozia

E 592 Krasnodar - Djoubga

E 601 Niort (A10) - La Rochelle

E 602 La Rochelle - Saintes

E 603 Saintes - Angoulème - Limoges

E 604 Tours - Vierzon

E 606 Angoulème - Bordeaux

E 607 Digoin - Chalon-sur-Saône

E 611 Lyon - Pont d'Ain

E 612 Ivrea - Torino

E 641 Wörgl - St. Johann - Lofer - Salzburg

E 651 Altenmarkt - Liezen

E 652 Klagenfurt - Loibl Pass - Naklo

E 653 **Letenye** - **Torniyiszentmiklós**

E 661 Balatonkeresztúr - Nagyatád - Barcs - Virovitica - Okučani - Banja Luka - Jajce - Donji Vakuf - Zenica

E 662 Subotica - Sombor - Osijek

E 671 Timisoara - Arad - Oradea - Satu Mare

E 673 Lugoj - **Ilia**

E 675 **Agigea** - Negru Vodă/Kardam

E 691 Ashtarak - Gumri - Ashotsk - Vale - **Turkgözü** - **Posof** - **Kars** - **Horasan**

E 692 Batumi - Samtredia

E 711 Lyon - Grenoble

E 712 Genève - Chambéry - Marseille

E 713 Valence - Grenoble

E 714 Orange - Marseille

E 717 Torino - Savona

E 751 Rijeka - Pula - Koper

E 761 Bihać − Jajce − Donji Vakuf − Zenica − Sarajevo − Užice − Čačak − Kraljevo − Kruševac − Pojate − Paraćin − Zaječar

E 762 Sarajevo - Podgorica - Border of Albania

E 763 Beograd - Čačak - Nova Varoš - Bijelo Polje

E 771 Drobeta Turnu Severin - Niš

E 772 Jablanica - Velico Tirnovo - **S**houmen

E 773 Popovica - Stara Zagora - Burgas

E 801 Coimbra - Viseu - Vila Real - Chaves - Verin

E 802 Bragança - Guarda - Castelo Branco - Portalegre - Evora - Beja - Ourique

E 803 Salamanca - Merida - Sevilla

E 804 Bilbao - Logroño - Zaragoza

E 805 Famalicäo - Chaves

E 806 Torres Novas - Abrantes - Castelo Branco - Guarda

E 821 Roma - San Cesareo

E 840 Sassari - Olbia ... Civitavecchia - intersection with E 80

E 841 Avellino - Salerno

E 842 Napoli - Avellino - Benevento - Canosa

E 843 Bari - Taranto

E 844 Spezzano Albanese - Sibari

E 846 Cosenza - Crotone

E 847 Sicignano - Potenza - Metapono

E 848 S. Eufemiu - Catanzaro

E 851 Petrovac - (Albania) - Prizren - Priština

E 852 Ohrid - Albanian Border

E 853 Ioannina - Albanian Border

E 871 Sofia - Kjustendil - Kumanovo

E 881 **Izmit - Bursa - Balikesir - Manisa - Izmir - Ceşme**

E 901 Madrid - Valencia

E 902 Jaén - Granada - Málaga

E 931 Mazara del Vallo - Gela

E 932 Buonfornello - Enna - Catania

E 933 Alcamo - Trapani

E 951 Joannina - Arta - Agrinion - Massalongi

E 952 Aktio - Vonitsa - Amfilochia - Karpenisi - Lamia

E 961 Tripoli - Sparti - Gythio

E 962 Elefsina - Thiva

E 001 Tbilissi - Bagratashe - Vanatzor

E 002 Alyat - Saatli - Mehgri - **Ordubad** - **Djulfa** - **Nakhchivan** – **Sadarak**

E 003 Uchkuduk - Dasshaus - Ashgabat - Gaudan

E 004 Kzylorda - Uchkuduk - Buchara

E 005 Guza - Samarkand

E 006 Ayni - Kokand

E 007 Tashkent - Kokand - Andijan - Osh - Irkeshtam

E 008 **Dushanbe** - **Kulab** - **Kalaikhumb** - Khorog - Murgab - **Kulma** - **border of China**

E 009 Jirgatal - Khorog - Ishkashim - Lyanga - China

E 010 Osh - Bishkek

E 011 **Kokpek** - **Kegen** - Tyup

E 012 **Almaty** - **Kokpek** - Chundzha - **Koktal** - Khorgos

E 013 Sary - Ozek - **Koktal**

E 014 Usharal - **Dostyk**

E 015 Taskesken - Bakhty

E 016 **Zapadnoe** - **Zhaksy** - **Atbasar** - Astana

E 017 **Elabuga - Ufa**

E 018 **Zhezkazgan** - **Karagandy** - **Pavlodar** - **Uspenka**

E 019 **Petropavlovsk** - **Zapadnoe**

Annex II

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CONDITIONS TO WHICH THE MAIN INTERNATIONAL TRAFFIC ARTERIES SHOULD CONFORM

I. GENERAL

The fundamental characteristics of the construction, improvement, equipment and maintenance of the main international traffic arteries, hereafter designated "international roads", are dealt with in the following provisions, which are based on modern concepts of road construction technology. They do not apply in built-up areas. The latter shall be by-passed if they constitute a hindrance or a danger.

The provisions of this annex take into account various criteria including traffic safety, environmental protection, fluidity of traffic flow and comfort of road users, applied on the basis of economic evaluation. **The provisions of this annex concerning tunnels shall apply to tunnels with lengths of over 500 m. Some of these provisions, however, concern long tunnels only.**

Countries shall make every possible effort to conform to these provisions both in the construction of new roads and in modernizing existing ones.

II. CLASSIFICATION OF INTERNATIONAL ROADS

International roads are classed as follows:

1. Motorways

Motorway" means a road specially designed and built for motor traffic, which does not serve properties bordering on it, and which:

(i) Is provided, except at special points or temporarily, with separate carriageways for the two directions of traffic, separated from each other by a dividing strip not intended for traffic or, exceptionally, by other means;

(ii) Does not cross at level with any road, railway or tramway track, or footpath; and

(iii) Is specially sign-posted as a motorway.

2. Express roads

An express road is a road reserved for motor traffic accessible from interchanges or controlled junctions only and which:

(i) Prohibits stopping and parking on the running carriageway(s); and

(ii) Does not cross at level with any railway or tramway track, or footpath.

3. Ordinary roads

An ordinary road is one open to all categories of users and vehicles. It may have a single carriageway or separate carriageways.

International roads should preferably be motorways or express roads.

III. GEOMETRIC CHARACTERISTICS

III.1 General considerations

The choice of geometric characteristics shall be such as to afford to all users proper safety and traffic flow conditions with a minimum of congestion, bearing in mind the function of the road and the general behaviour of drivers.

The general rules of design apply to both the construction of new roads and the modernization of the existing network. In the latter case, however, account shall be taken of special constraints and situations and the basic rules shall be applied flexibly so as to conserve the general consistency of the route. Less importance may therefore be attached to some basic parameters while upgrading the quality of the alignment and its perception by the driver ("readability" of the road) so as to improve safety.

The progressive improvements to a road shall be effected with particular care so as, at each stage, to respect the general consistency of the route (importance of transitions).

When a motorway or a road with separate carriageways is constructed in stages, involving the initial inauguration of a single two-way carriageway, care shall be taken in designing this first phase so that its two-way nature is clearly recognizable by users and so that it can function as such; this will involve the need to ensure overtaking visibility for traffic in each direction along most of the alignment and, as far as possible, to conceal such installations as must be constructed in their final form from the outset.

The parameters of the design and dimensions depend on the choice of category of road, which is conditioned by its functions, its location (topography, land use, etc.) and the general technical and economic context. The choice of category shall take account of:

Internal consistency (homogeneity) of construction characteristics;

Consistency of the road with the user's perception of it.

It will then be possible to define a consistent overall approach to the development of the route (or section) under consideration, and to decide accordingly on all the components of the project (geometry, signs and equipment, and junctions).

A range of design speed is associated with each category of road.

The design speed is that speed which in a scheme for the improvement or construction of a road is chosen to determine geometric characteristics permitting isolated vehicles to travel at this speed in safety.

The range of recommended design speeds in km/h on international roads is as follows:

Motorways	x	80	100	120	140
Express roads	60	80	100	120	x
Ordinary roads	60	80	100	x	x

Design speeds of over 100 km/h should not be selected unless the carriageways are separated and the layout of intersections so permits.

The lowest design speeds (60 km/h for roads or 80 km/h for motorways) may be used on highly restrictive sections.

The design speed may be reduced in exceptional cases on sections of limited length of the road and in difficult topographic and other conditions. Changes from one design speed to another should be applied gradually in such a manner that they can be easily foreseen by the driver.

The concept of “design speed” may not be applicable to certain routes with a difficult topography.

International roads shall present homogeneous characteristics over sufficiently long sections. Changes of category shall be made at points where they are quite clear to users (approaching built-up areas, change in topography, interchanges**, toll areas and frontier posts)** and particular attention shall be paid to transition zones.

It is also important to verify that minimum conditions of safety are observed at all points on the road, taking into account the actual speeds at which most users travel, in the light of the general configuration of the alignment and the regulations in force.

International roads should provide for traffic of motor vehicles in accordance with national regulations concerning the sizes, total weight and axle load.

III.2 Horizontal and vertical alignment

III.2.1 Basic parameters

The horizontal and vertical alignment shall be coordinated in such a way that the road is perceived by the driver as being without undue discontinuities of alignment, permits him to anticipate his manoeuvres and to see clearly the critical points, in particular junctions and entrances and exits of interchanges.

The rules for the dimensions of the horizontal and vertical alignment shall be based on conventional traffic engineering parameters (reaction times, friction coefficients, height of obstacle, etc.) for the majority of users.

The recommended minimum values for the parameters of the horizontal and vertical alignment are given in the following table:

Design speed (km/h)		**60**	**80**	**100**	**120**	**140**
Minimum radii in plane (corresponding to maximum superelevation 7%)		120	240	**450**	650	1 000
Maximum gradient (percentage not to be exceeded)*****		8	7	6	5	4
Maximum longitudinal gradient in new tunnels**		**5**	**5**	**5**	**5**	**5**
Minimum radii at the highest point of the vertical alignment (in m)	One-way	1 500	3 000	6 000	10 000	18 000
	Two-way	1 600	4 500	10 000	-	-
Minimum radii at the lowest point of the vertical alignment		1 500	2 000	3 000	4 200	6 000

*** The maximum gradient should be decreased by 1% in the case of express roads and motorways. When the maximum gradient is applied, an additional lane for slow-moving vehicles should be envisaged.**

**** Unless no other solution is geographically possible. In tunnels with gradients higher than 3%, additional and/or reinforced measures should be taken to enhance safety on the basis of a risk** analysis.

The minimum vertical alignment radii shall be avoided at the approaches to critical points (junctions, interchanges, accesses, entries to built-up areas, etc.).

The gradient resulting from longitudinal slope and superelevation shall not exceed 10%.

Horizontal alignment curves shall, when appropriate, be introduced by transition curves.

III.2.2 Conditions of visibility

Visibility distances shall be at least equal to stopping distances for obstacles over the whole length of the road.

Minimum values are given for guidance in the table below:

Design speed (km/h)	60	80	100	120	140
Minimum stopping distance (m)	70	100	150	200	300

On two-way roads, the minimum visibility distances required for overtaking shall be provided on as great a percentage of the length of the road and be as uniformly distributed as possible.

Where visibility is insufficient, the construction, on single carriageway two-way roads, of passing areas or judiciously-sited local widening of the road is recommended.

In areas where visibility distances cannot be ensured (permanently or temporarily), appropriate road markings and signs shall prohibit overtaking in a form clear and perceptible to users.

III.3 Cross-section between junctions

The formation of international roads shall comprise, in addition to the carriageway or carriageways, verges and possibly a central reserve and special paths for pedestrians and cyclists. Such special paths shall not be permitted within the formation of motorways and express roads.

The cross-section shall be such as to ensure at all times the smooth flow of current and foreseeable traffic in proper conditions of safety and comfort.

In this respect, tunnels and bridges, structures which are an integral part of the road system, **should**, to the extent possible, with the exception of the emergency lane, have the same number of traffic lanes as there are before and after these structures. Any change in the number of lanes should occur at a sufficient distance from the entrance to these infrastructures.

For tunnels, the principal criteria to be taken into account in deciding on the number of tubes to build (a single tube or two tubes) are traffic forecasts and safety (taking into account such aspects as the percentage of heavy goods vehicles, gradient and length).

Emergency stopping places (lay-bys) should be provided at least every 1000 m in narrow bidirectional tunnels with heavy traffic.

New tunnels without an emergency lane should as far as possible be provided with emergency walkways, elevated or not, for tunnel users in the event of an incident. In existing tunnels where there is neither an emergency lane nor an emergency walkway, additional and/or reinforced measures **should** be taken to ensure safety.

III.3.1 Number and width of traffic lanes

The choice of the number of lanes shall be based on current and foreseeable flows of traffic. It must ensure that the necessary standard of service is provided, taking into account the economic function of the road.

Operational measures **with a view to temporarily increasing capacity, *inter alia*, counterflow traffic, speed reductions and a reduction in the width of lanes**, may also ensure a steady flow of traffic under certain special conditions **and during certain periods.**

Particular care shall be taken in regard to the construction of three-lane roads and the use of the central lane. The central lane should not be used for overtaking in both directions at the same time.

Separate one-way carriageways are strongly recommended for four-lane roads so as to maintain proper safety standards.

Additional lanes should be considered, especially on gradients when the proportion and speed of slow vehicles lead to unacceptable reduction in service level.

Traffic lanes on a straight alignment should have a minimum width of 3.50 m. Extra width shall be provided in small radius curves so as to make room for the largest authorized vehicles.

The width of supplementary lanes on gradients can be reduced to 3 m.

III.3.2 Shoulders

The shoulder can be taken to comprise a stabilized or paved section and a grass or gravel verge.

The recommended minimum width of shoulders is a range from 2.50 m for ordinary roads to 3.25 m for motorways. On difficult sections of mountainous terrain and on sections crossing intensively urbanized areas, **with constructions such as fly-overs, viaducts, bridges and tunnels** and also on sections equipped with acceleration or deceleration lanes, the width of shoulder can be reduced.

On motorways, the shoulders should normally include a continuous stopping strip (emergency stopping strip) of at least 2.50 m (3 m if heavy vehicle traffic so justifies), stabilized and paved so as to permit stopping.

On ordinary roads, the provision of stabilized lateral strips of at least 0.7 m width, clearly differentiated from the carriageway, is recommended.

For safety reasons, an obstacle-free area of at least 3 m beyond the edge of the running carriageway should be provided, if possible, and obstacles which are too close to the edge of the carriageway shall be isolated by appropriate means.

In the absence of a stopping-strip, parking areas (stopping points) shall be provided at intervals. Where necessary, draw-ins for buses shall also be provided.

When two-wheeled traffic so justifies, special facilities (cycle paths or strips) shall be envisaged. Special facilities for pedestrians shall also be envisaged when their presence makes it necessary.

The verge shall be sufficiently wide to permit clear visibility and provide room for highway equipment (signs, barriers - see chapter IV) where necessary.

III.3.3 Central reserve

The recommended minimum width of the central reserve on motorways and roads with separate carriageways is about 3 m. This minimum width may be reduced in highly restrictive areas, although an adequate width must be maintained for the installation of a safety fence. Adequate safety fences shall be provided in such cases (see chapter IV).

The central reserve shall normally be equipped with safety fences (crash barriers or safety barriers) unless it is wide enough to result in little risk of vehicle cross-over accidents.

III.3.4 Crossfall

On straight or nearly straight alignments the carriageway crossfall as a rule should be from 2% to 3% to facilitate water runoff. The slope should be from a central crown on two-way roads and slope outwards from the central reserve where there are separate carriageways.

Areas of varied superelevation should be treated with special care to ensure adequate water runoff.

III.4 Overhead clearance

Overhead clearance shall be not less than 4.5 m.

III.5 Intersections*

An intersection is a point at which two or more traffic flows meet.

III.5.1 Choice of type of junction

The whole of the interchange system shall be treated consistently over the whole route, both in terms of the location and distances between interchange points, and in the choice of facilities which must be clear to all users and so designed as to minimize risks of conflict (particularly in traffic cuts).

The number of interchange points may also be reduced by re-routing some traffic flows to better constructed neighbouring junctions.

International roads shall normally have priority, except at specific points (intersection with another international road, transition zones, roundabouts) where loss of priority may be allowed.

On two-way roads, intersections can either be grade separated or level junctions. Grade-separated junctions may be envisaged for important interchange points if economic conditions so permit, as well as grade separation without interchange for re-establishing certain communications (agricultural traffic, for example).

Roundabouts are a solution under certain conditions (transition areas, outskirts of a built-up area, large-scale interchange movements).

On roads where the carriageways are separated, intersections shall generally be constructed on separate levels (grade-separation of flows), since level junctions with interchanges can be envisaged only under certain specific conditions in which safety criteria can be respected.

Intermediate solutions (grade separation without interchange, no-left-turn half-junction) may be envisaged under certain conditions.

On motorways, grade-separated intersections shall be obligatory.

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* Note: This text is based on the assumption that traffic keeps to the right.

The use of junctions **with traffic light signals (three colour system)** outside built-up areas may be envisaged provided that their visibility and successful operation can be ensured without risk to users.

III.5.2 Layout of level junctions

Level junctions shall be constructed in accordance with the rules in force on the basis of the following general principles:

- The best possible conditions of visibility and perception of the junction shall be ensured on approaches from main or secondary roads;

- Complex layouts shall be avoided and the geometry made as simple as possible consistent with the functions of the junction, so as to render it readable and comprehensible to users. Junctions comprising more than four branches shall therefore be simplified by grouping certain traffic streams, or shall be treated as roundabouts;

- Geometry and traffic-signals shall be used to warn and slow down non-priority users. The junction should include on the non-priority carriageways directional islands, bordered, for example, by a slightly raised kerb to channel secondary flows (diversion of lanes);

- Intersecting lanes shall intersect one another as nearly at right angles as possible;

- Left-turn***** deceleration lanes shall be provided on the road as soon as the corresponding traffic reaches a substantial level;

- Priority-road users shall be forewarned and excessively wide lanes avoided, since they encourage speeding, reduce vigilance and make crossing more difficult (for example, avoid increasing the number of through lanes, and provide deceleration lanes to the right and merging lanes only if the traffic so justifies);

- In the case of substantial interchange traffic and in the presence of left-turn***** deceleration lanes, the central storage area and special lanes shall be indicated clearly (islands, and appropriate markings and surfacing);

- When necessary, direct and clearly marked paths for pedestrians and cyclists shall be provided.

***** Note: This text is based on the assumption that traffic keeps to the right.

III.5.3 Interchanges

III.5.3.1 General provisions

Interchanges are grade-separated junctions with slip roads permitting traffic to pass from one road to the other.

The choice of the form of interchanges shall be based on the objectives of simplicity and uniformity.

Uniformity shall be taken to be “operational”, i.e. linked to the fact that motorway-users “expect” to have to make similar manoeuvres, even in interchanges of different types.

The form of an interchange shall depend on the topography, the relative importance of traffic flows, the type of intersecting road and the possible presence of toll booths.

III.5.3.2 Geometric characteristics

Slip roads: It is desirable for slip roads, including lateral markings and shoulders, to have the following minimal widths:

One-way carriageway: 6 m, including horizontal markings and shoulders;

Two-way carriageway: 9 m including horizontal markings and shoulders.

The characteristics of the alignment of slip roads should be as follows (but in exceptional cases the standards below may be reduced):

- Internal minimum radius on the level 50 m
- Maximum ascending gradient 7%
- Maximum descending gradient 8%
- Minimum radius in convex vertical curve 800 m
- Minimum radius in concave vertical curve 400 m

Horizontal curves shall be joined **by transition curves** of a suitable length**.** For this purpose it is also necessary to apply appropriate signs and/or markings.

Weaving sections: It is recommended that weaving sections should be long enough to allow movements to be effected in complete safety.

Divergence of traffic streams: Where a carriageway divides into two other carriageways, the separation of the two traffic streams shall be so effected as to be clearly perceptible.

To this end, the user shall have time to move into the lane most appropriate for the direction he wishes to take, and shall have a sufficiently clear view of the point of divergence. It is therefore also necessary to apply appropriate signs and/or markings.

The less important traffic stream shall be required to leave by the right-hand carriageway.

Convergence of traffic streams: Where two carriageways converge to form one single carriageway, the integration of the two traffic streams shall be effected in safe conditions and shall not entail any significant reduction in the speeds of vehicles.

To this end:

(a) The drivers in the less important traffic stream shall preferably merge from the right into the more important traffic stream;

(b) The drivers who have to merge shall have a good view of the other carriageway before and beyond the point of convergence. The merging manoeuvre, where appropriate via an acceleration lane, shall not entail any appreciable reduction in the speed of the principal stream.

(c) Should the total number of converging traffic lanes be reduced, this reduction should be made at a sufficient distance from the point of convergence.

III.6 Deceleration and acceleration lanes

It is recommended that acceleration and deceleration lanes should be provided for access to or exit from the main carriageway at interchanges or related areas. These lanes shall be of constant width and either followed or preceded by a taper.

The length of the acceleration and deceleration lanes shall be calculated in accordance with the design speed or the traffic flow.

III.7 Railway intersections

It is desirable for the railway intersections with international roads to be at different levels.

IV. EQUIPMENT

IV.1 General considerations

The types of road equipment described below constitute an essential element in the functioning of the road network and have an important impact on fluidity and safety of the traffic as well as on the comfort of road users.

Regular checking of the functioning of all such equipment and appropriate maintenance will enable it to ensure maximum efficiency.

IV.2 Vertical signs and road markings

IV.2.1 General characteristics of vertical signs and road markings

Vertical signs and road markings, in accordance with the principles set out in international conventions and agreements, contribute to the comprehensibility of the road and shall be designed and executed in such a way as to be consistent with each other and with the components of the project in general.

The basic prerequisite for signs shall be homogeneity; they are intended for users moving rapidly and shall therefore be visible from an adequate distance by day or by night, and be immediately comprehensible.

An effort should be made to generalize the use of non-literal messages, with standardized dimensions, symbols and characters, so as to make them easily comprehensible to road users of any country.

Illuminated panels or panels using retro-reflective materials shall be used for signs on roads which are not lit and may also be used on roads which are equipped with permanent lighting. It is recommended that markings on roads without permanent lighting should be executed using retro-reflective materials.

It is also important to avoid having too many signs.

IV.2.2. Road markings

Road markings shall be harmonized with vertical signs and the materials used shall have a high skid resistance.

IV.2.3 Vertical signs

In view of the international nature of the roads under consideration, particular care shall be taken in the use of indicator panels and the use of the “E” sign.

The effectiveness, and particularly the comprehensibility and readability of the signs depends on a number of conditions, their dimensions and correct siting, predominance of international symbols over words, brevity of the message conveyed, use of the same alphabet over the entire international network (other alphabets should be used only in conjunction with Latin characters), appropriate sizes for symbols and characters and the suitable proportions in relation to their background and the maximum speed of traffic.

IV.2.4 Roadworks and emergency signs

For roadworks, emergencies (accidents) or ongoing operations entailing the closure of carriageways or lanes to traffic, adequate temporary signs shall be installed so as to ensure the safety of users and the personnel involved in such operations. These signs shall be removed once they are no longer required.

Within an area of road lighting the signs shall be retro-reflective. Where there is no road lighting the signs shall be retro-reflective and, as far as possible, combined with special illuminating guiding devices.

Permanent signs which are in contradiction with the temporary signs shall be removed or concealed.

IV.3 Equipment and user services

IV.3.1 Safety fences and barriers

Safety fences and barriers are designed to prevent a vehicle accidentally leaving the carriageway or to limit the consequences of its doing so.

The choice of device (guard-rails, crash barriers, safety barriers and fences) and the conditions for their use shall depend on the type of vehicle to be arrested, the cross-section, the possible consequences of vehicles leaving the carriageway, specific problems of visibility and difficulty of maintenance.

Since such devices themselves constitute obstacles, they shall not be installed unless the risk attendant on not doing so justifies them.

Such safety devices shall normally be provided on structures **and in their approach zones.**

The use of safety devices on the central reserve depends on a number of factors, the most important of which are the volume of traffic and the width of the central reserve itself.

Safety devices shall be provided on shoulders where protruding non-brittle obstructions are situated too near the carriageway, where the height of embankments or the slope of banks constitutes an obvious hazard, or on sections bordered or crossed by a watercourse, a heavily used road, a railway, etc.

IV.3.2 Delineators

The installation of delineators (i.e. road studs and hazard marker posts) furnished with retro-reflective devices may considerably improve perception of the alignment.

IV.3.3 Anti-glare devices

Outside lighted sections, it might be advisable to install an artificial screen or a hedge on the central reserve of motorways and expressways, or on the shoulder when another road runs along the "E" road. It is advisable to make sure that such arrangements do not obstruct the visibility for road users and do not reduce the efficiency of traffic safety devices installed nearby.

IV.3.4 Arrester beds

To ensure the safety of lorries on very long, steep gradients, it may be useful to provide judiciously-placed arrester beds alongside the downhill lane. This facility should, however, be the exception, and be reserved for instances when no other solution can be envisaged.

IV.4 Traffic control and user information

IV.4.1 Traffic light signals

Traffic light signals shall be used in accordance with the international conventions and agreements in force. Flashing amber lights may be used to indicate a particular hazard (roadworks, toll gates, pedestrian crossings, etc.) thus encouraging users to pay more attention and reduce their speed.

Temporary traffic light signals may be provided in some exceptional cases (e.g. alternating traffic as a result of roadworks or accidents).

IV.4.2 Variable traffic signs

Variable traffic signs shall be as comprehensible as static road signs, and be legible by day and night to drivers in all **lanes.**

IV.4.3 Emergency communication systems

The provision of emergency telephone or other communication posts, indicated by specific signs, linked to a centre operating 24 hours a day is recommended on all types of international roads. Such call-points would be installed along the road on the outer verge away from structures, regularly spaced and at reasonably frequent intervals. On motorways an interval of 2 km is recommended. An emergency communication system should include signs (or panels) indicating the direction and distance to the nearest call-point.

Where a special road emergency communication system does not exist on express roads and ordinary roads the general telephone system can be utilized and signs indicating the position of the nearest public telephone would be helpful.

Special allowance can be made for long bridges and tunnels.

The operation of call-points shall be simple, easy for users to understand and preferably explained by symbols or ideograms.

IV.4.4 User information

Up-to-date information on road and traffic conditions should be transmitted to road users by appropriate means. Possibility of receiving such information in tunnels is advisable.

IV.5 Road lighting

Lighting is desirable at some special areas such as frontier posts, tunnels, adjoining areas, interchanges with other "E" roads**, toll areas, etc.** When the volume of traffic justifies its installation and operation, homogeneous and adequate road lighting may also be advisable if the road crosses or borders an area in which the lighting may inconvenience traffic on the international road (airports, industrial or heavily built-up areas, etc.).

IV.6 Auxiliary facilities installation

IV.6.1 Safety of pedestrians and cyclists

On ordinary roads, special paths for pedestrians and cyclists may improve the safety.

The utmost attention shall be paid to crossings for two-wheeled vehicles and pedestrians, especially at junctions.

IV.6.2 Protection of disabled persons

Users, whether passengers or drivers, for whom travel is difficult or who are not able to provide for their own immediate needs unaided, shall also be able to use the road with ease.

The design of the road and its equipment must thus be such as to minimize the critical situations in which such users may find themselves.

It is necessary in any case to ensure that the constraints imposed on users, particularly in rest and service areas, are compatible with their capabilities.

IV.6.3 Protection from **and of** animals

In order to protect users from animals adequate fencing shall be provided wherever the topography indicates a risk of animals crossing.

Protective measures must also be taken for the animals themselves, such as over- or under-passes of suitable size and shape.

IV.7 Service facilities

Depending on the characteristics of their operation, separate rest areas, service areas, frontier posts, etc., shall be provided along international roads.

IV.7.1 Rest areas

Rest areas away from interchanges enable users to stop in an environment which provides a break from the monotony of traffic; in such cases landscaping is of great importance.

Rest areas should be provided at appropriate intervals; a sign indicating the approach to a rest area should also indicate the distance to the next rest or service area.

Water points, tables, shelters and toilets with easy access for physically disabled persons are desirable.

IV.7.2 Service areas

Service areas adapted both to the site and to its users (tourists, road hauliers, etc.) and away from interchanges shall provide a minimum of services such as parking, telephone, fuel and toilets with easy access for physically disabled persons.

These areas should be provided at appropriate intervals, taking into account, among other things, the volume of traffic; a sign indicating the approach to a service area should also indicate the distance to the next service area.

All traffic and parking areas shall be separated from the carriageway(s) of the E-road.

IV.7.3 Toll areas

Toll areas comprise a progressive widening of the carriageway or interchange loops up to and beyond the control lanes.

The number of control lanes shall be determined in terms of the volume of traffic anticipated.

Toll booths should be situated in open areas; it is not advisable to situate them at the bottom of a descent.

Adequate spaces shall be provided outside the control lanes for the buildings and installations required for collecting tolls, for surveillance and the personnel involved.

IV.7.4 Frontier posts

The location, dimensions and form of frontier posts, as well as the type and layout of the installations, buildings, parking areas, etc., shall be selected on the basis of the checks anticipated and

the traffic passing through such posts. By means of agreements with the neighbouring States, joint frontier control installations as well as coordinated control services with sufficient personnel shall be aimed at.

The structure and form of a frontier complex and the internal communications network should, with effective signposting that is coordinated among the neighbouring States, make it possible to preselect and separate passenger and goods traffic according to the different kinds of control before they arrive at the buildings and installations. At frontier posts with high lorry-traffic peaks, lorry reception areas for precontrol or preselection according to the kinds of control should be provided for in front of the frontier control installations themselves.

V. MANAGEMENT, SAFETY EQUIPMENT AND GENERAL ARRANGEMENTS FOR TUNNELS

V.1 Traffic management systems

Tunnels with high traffic volume should be equipped with traffic management systems in order to avoid traffic congestion, particularly in the case of an incident.

In the case of long or short-term closure of tunnels, the best possible alternative itineraries should be planned and indicated to users at diversion locations situated in advance of the tunnel.

In the event of a serious accident, all the affected tubes of the tunnel should immediately be closed to traffic. The traffic should be managed in such a way that unaffected vehicles can quickly leave the tunnel.

V.2 Control centre

A control centre should be provided for long tunnels with a heavy volume of traffic. Surveillance of several tunnels may be centralized at a single control centre.

For tunnels starting and ending in different countries or falling under the control of different national regions, one single control centre should be designated as being in control at any given time.

V.3 Emergency exits and access for emergency services

The need to provide emergency exits and the distance between them should be decided on the basis of a risk analysis of the tunnel in question. However, in new tunnels, emergency exits should be provided where the traffic volume is higher than an annual daily average of 2000 vehicles per lane.

The maximum distance between two emergency exits should not exceed 500 m.

Shelters without an exit leading to escape routes to the open air should be avoided in future tunnel construction.

In twin-tube tunnels, in the event of an incident in one tube, the other tube may be used as an escape and rescue route. To this effect, the tubes should be connected at regular intervals by cross-connections for pedestrians and by cross-connections allowing the passage of emergency services. In the absence of these, direct connections with the outside or with an emergency gallery should be provided in each tube.

For twin-tube tunnels, wherever geographically possible, crossing of the central reserve (median strip) should be made possible outside each entry and exit allowing the passage of emergency services to gain immediate access to either tube.

V.4 Tunnel equipment

All safety installations or facilities for tunnel users, in particular, emergency telephones, fire extinguishers, emergency exits, lay-bys, or the indication of radio frequencies or use of radio should be signalled by means of fully visible signs and panels. The signs and panels to be used are described in the Vienna Convention on Road Signs and Signals of 1968.

The safety equipment required in tunnels should be defined on the basis of a risk analysis of the tunnel under consideration. A list of such equipment is provided below. Some of this equipment is intended mainly for long tunnels and/or tunnels with heavy traffic.

V.4.1 Lighting devices, power supply and electrical circuits

Normal lighting to ensure appropriate visibility day and night for drivers;

- Safety lighting to allow a minimum visibility in the event of a breakdown of the power supply;

- Evacuation lighting, such as evacuation marker lights, at a height of no more than 1.5 m to guide tunnel users to evacuate the tunnel on foot, in the event of an emergency;

- Emergency power supply capable of ensuring the operation of safety equipment indispensable for the evacuation of users;

- Design of electrical, measurement and control circuits such that a local failure (such as one due to a fire) does not affect unimpaired circuits.

V.4.2 Emergency provisions

- Emergency stations, equipped with at least an emergency telephone and two fire extinguishers, should be installed at the entry and exit of tunnels and inside at regular intervals. These intervals should not exceed 150 m for new tunnels and 250 m for existing tunnels.

- In addition, a water supply should be provided for the fire brigade near the tunnel entry and exit and inside at intervals which should not exceed 250 m.

V.4.3 Ventilation systems

Appropriate ventilation systems should be provided to ensure the control of pollutants emitted by road vehicles under normal conditions and in the event of an incident, and the control of the air and of smoke in the event of a fire. When mechanical ventilation is necessary, the following recommendations should be observed:

- In tunnels with congested bidirectional or unidirectional traffic, longitudinal ventilation should be used only if a risk analysis of the tunnel in question shows it is acceptable and/or if appropriate measures are taken.

- Transverse or semi-transverse ventilation systems should be used in other cases.

- In bidirectional tunnels with transverse or semi-transverse ventilation, equipped with a control centre, when justified by the length and the traffic, air and smoke extraction dampers should be installed which can be operated separately or in groups. In addition, the longitudinal air and smoke velocity should be monitored constantly and the steering process of the ventilation system adjusted accordingly.

- In twin-tube tunnels, appropriate means should be implemented to stop the propagation of smoke and gases from one tube to the other in the case of fire.

V.4.4 Other safety improvement devices and systems

- Radio broadcast installations that can be used by the emergency services;

- Systems for video surveillance and automatic detection of incidents and/or fires;

- User information systems (radio, loudspeakers, variable message signs);

- Traffic lights, barriers and other equipment to stop vehicles when necessary before the tunnel entrance and, if required, road signs and other appropriate devices within the tunnel;

- Overheating control systems for heavy goods vehicles (to be installed outside tunnels);

- Road signs and/or markings to help drivers to maintain an adequate distance from the vehicle in front;

- Automatic systems for detecting violations of traffic regulations particularly regarding speed limits and distance between vehicles.

V.5 Fire resistance of the structure

The main structure of tunnels where a local collapse may have catastrophic consequences (for example, an underwater tunnel or a tunnel liable to cause the collapse of large adjoining structures) should ensure a sufficient level of fire resistance.

VI. ENVIRONMENT AND LANDSCAPING

VI.1 General remarks

Roads are a tool for road-users, designed within the framework of town and country planning. They make possible the movement and transport of people and goods and offer access to work, rest and leisure areas. However, in some circumstances they can give rise to various nuisances (noise, pollution, vibrations) both in and outside urban areas; these have taken on a new dimension as a consequence of a considerable increase in road traffic. Taking account of the impact of a road on the environment must therefore be considered carefully with the general aim of maximizing the positive effects on the environment and correcting the negative ones.

The concern to preserve the quality (visual and ecological) of the environment also means that roads must be designed to harmonize with landscapes.

It is therefore important that all administrators should acquaint themselves with the environmental features involved and should subsequently take appropriate measures to inform users of the presence of these features and the regulations protecting them, or should take steps to protect them physically.

VI.2 Integration of roads into the environment

When a new project is proposed or existing roads are upgraded, consideration should be given to the direct and indirect effects of the roads and traffic on:

- People, fauna and flora;
- Soils, sub-soils, water, air, microclimate;
- Landscape, physical property and cultural heritage.

In this regard the following factors should ideally be taken into account:

Good coordination of the alignment and the longitudinal profile, in relation to the elements of the landscape, should ensure not only harmonious integration of the alignment with local topography and land use but also prevent unfavourable impact on the safety of road users.

Acoustic nuisances, vibration and air, water and soil pollution deriving from traffic and from the maintenance and exploitation of roads, should be limited as far as possible by appropriate means, in accordance with the regulations of the countries concerned.

Whenever a new road and the works involved have a great influence on the landscape, it would be better to take care of their quality by creating a new landscape rather than trying to mask it.

VI.3 The main adverse effects of roads on the environment

The most acute problems generally arise from water and noise pollution. Water pollution

may affect man and his environment, while noise directly disturbs the rhythm of his life and particularly his sleep.

VI.3.1 Water pollution

There are four types of pollution caused by roads. As conventional drainage systems can remove only a small fraction of the pollution deposited on the roadway, specific solutions need to be devised for each type of pollution.

VI.3.1.1 Pollution during roadworks

On the one hand, there is the erosion by rainwater of the bare soil and embankments, which carries off fine materials. To avoid this, it is important to clear and strip only the surfaces necessary for the work. The temporary installation of desilting or infiltration basins makes it possible to reduce and hold back the waste materials in the most susceptible places. On the other hand, the works vehicles leave behind traces of oil and suspended solids.

VI.3.1.2 Seasonal pollution

Seasonal pollution is caused by dissolvable and abrasive de-icing products used in winter maintenance, most of which are based on sodium chloride. This type of pollution can be reduced by salting the roads less and reducing the amount of salt used. Moreover, it is strongly advised to cover stocks in order to avoid the constant discharge of brine.

VI.3.1.3 Accidental pollution

Accidental pollution results from spills following road accidents involving the transport of dangerous goods. Statistics show that such accidents usually take place outside built-up areas. Hydrocarbons are the main cause of this type of pollution. Solutions to this problem involve both measures to adapt the infrastructure and operational measures. Susceptible environments can be protected by installing crash barriers or embankments or by building a watertight drainage system.

VI.3.1.4 Chronic pollution

Chronic pollution describes all the forms of pollution associated with road traffic: wear of the roadway, metal corrosion, tyre wear and exhaust emissions. It should be noted that only a small proportion of the amounts emitted is carried off by rainwater to discharge points. However, a rainstorm or mini-flood can drain a sizeable area and thus cause more widespread pollution. The cleansing capacities of ditches and soil should therefore be maximized.

VI.3.2 Noise

Road noise is typically a combination of unpleasant and undesirable sounds caused by the passage of light and/or heavy vehicles. The noise level, measured in decibels (dBA), can cause disturbances in people's daily lives and sleeping habits.

The relationship between the noise level experienced and disturbances allows us to define the thresholds above which noise-reduction measures should be taken. These thresholds, which should be set nationally or, failing that, by administrators, vary from country to country.

VI.3.2.1 Factors to be taken into account

The following factors concerning noise should be taken into account in environmental impact assessments:

- Information on the estimated daytime and night-time traffic and on the traffic observed at particular times (percentage of heavy goods vehicles);
- Inhabited or sensitive areas, where necessary;
- Information on relief;
- Nature of the project: new, existing or modified;
- Information on the road surface;
- Nature of buildings to be protected; measures differ for hospitals, housing and factories;
- Category of road concerned and speed limit(s) authorized, etc.

VI.3.2.2 Measures to be taken

The measures to be taken are:

- Avoid inhabited or sensitive areas (schools, hospitals);
- Install protective devices (noise barriers);
- Use less noisy surfaces where possible;
- Soundproof facades;
- Take account of the existing noise pollution in planning documents.

VI.4 Taking account of the landscape and the cultural environment

Such elements of the landscape that are visible from the road will contribute to traffic safety and to the comfort of road users. They should supplement and reinforce visual guidance and add to the interest of the journey.

The sight of towns, rivers, hills, etc., gives users an opportunity to take their bearings and should be conserved as far as possible.

Plantations (in alignment or other forms) may contribute to improving visual guidance and to breaking the monotony of the road alignment, provided that the conditions of their implementation do not create additional risks.

Landscaping may also contribute to protection against dazzle and against adverse weather conditions (wind, snow, etc.).

When the installation of noise barriers is considered, care should be taken in their construction to ensure that they are integrated to the maximum into the landscape and compensate users for any information hidden.

It is desirable for the cultural heritage of the regions travelled through to be brought to the attention of users by appropriate means: signs, information centres in service and rest areas, etc.

For primarily safety reasons, commercial advertising near roads should be avoided."

VII. MAINTENANCE

VII.1 General considerations

Roads and auxiliary facilities should be maintained as close as possible to their original condition, to preserve their investment value and to ensure constant levels of safety and comfort.

It is advisable that from the initial design and construction stages, account be taken of future maintenance activities, in order to reduce the costs and negative effects on traffic flow **and safety**.

Complete or partial closure of lanes due to construction or maintenance works planned in advance should always begin outside tunnels.

Maintenance concerns all the elements which make up the road: pavements, structures, embankments and cuts, drainage signs and markings, traffic control systems, landscaping, **buildings,** etc.

Landscaping should be designed with regard to future maintenance aspects. Growth of trees and bushes should be monitored and action taken if necessary to avoid obscuring signs and the obstructions of safety equipment.

Any special equipment needed for maintenance should not impair the safety of road users and excessively hinder the normal traffic flow and operations.

A systematic and rational approach to maintenance activities can reduce substantially the direct costs of road administration as well as the indirect costs incurred by road users on the given road network. The distinction between preventive maintenance and rehabilitation operations is

necessary to optimize the cost-benefit effects of a maintenance programme during the decision-making process of an authority.

VII.2 Maintenance management

Maintenance management closely related to traffic management should be supported by procedural and technical inspection plans, systematic data collection and analysis, instructions, etc. These **measures** should be implemented by the road administration as an expedient to road maintenance efficiency and to account for compromise solutions in certain cases.

The operational organization set up to survey the level of maintenance of the actual road facilities and equipment, should have at its disposal an updated and complete inventory of all the elements of the road under consideration. This is an essential part of the operation allowing rapid decisions and action in case of incidents which reduce the traffic flow or in case of accidents.

The planning and budgeting operation, providing priorities for the technical interventions, should be based on results of systematic measurements and observations of pavement conditions, the aspect and visibility of vertical road signing and of horizontal markings (both by day and by night), etc., in the light of international standards requirements. This technical inspection and verification is recommended as essential information for the elaboration of preventive or rehabilitation maintenance in the context of the local transport economy.

The executive organization, responsible for the supervision of maintenance work, should also regulate all temporary measures needed during the maintenance activities, ensuring safety requirements, efficient working and applied technology. Restrictions, traffic speeds, design characteristics etc., need a consequent scheduled plan of provisions and regulations.

VII.3 Specific **aspects of maintenance**

Maintenance of road elements directly linked to traffic safety should be given maximum priority. These include:

- Pavements, regarding their skid resistance and drainage of surface water;
- Structures, especially expansion joints, supports, parapets, etc., of bridges and viaducts; tunnel installations;
- Lighting; safety devices;
- Road signs and markings;
- Total viability throughout the year: provision for snow and ice removal, and for other particularly unfavourable environmental weather situations;

- Works involving merging the road into its environment, such as anti-noise barriers, landscaping, etc.

It is essential to ensure the quality of carriageways and road structures at high level through a coherent maintenance policy and to guarantee transport reliability during maintenance operations. Maintenance activities should be executed in good time in order to avoid the mechanism of progressive pavement failure.

The safety of road workers as well as that of road users is to be ensured through adequate protective measures which must be both foreseen in the planning of activities and regularly checked throughout the work.

The provision of road safety equipment, signs and markings is essential on work sites to avoid accidents, traffic delays, etc., and installations must be clearly visible both by day and by night. Systematic inspections should ensure that they are visible and understood according to the requirements of the international conventions in force. Temporary equipment and road signing should also be in conformity with these conventions.

Under winter conditions, through appropriate measures, traffic safety and operation shall be secured to the maximum extent possible. Special attention should be given to maintaining adequate skidding resistant surfaces and to the clearance of snow and ice from road signs. This operation should be considered as an additional maintenance activity for winter conditions.

Annex III

IDENTIFICATION AND SIGNING OF E-ROADS

1. The sign to be used for identifying and signing E-roads is rectangular in shape.

2. This sign consists of the letter E, generally followed by the number in Arabic numerals attributed to the route.

3. It has a green ground with white inscription; it may be affixed to or combined with other signs.

4. Its size should be such that it can be easily identified and understood by drivers of vehicles travelling at speed.

5. The sign to be used for identifying and signing E-roads does not preclude the use of a sign for identifying roads on a national basis.

6. In principle, E-road numbers will be integrated into (or combined) with the system of direction signs of the member country in question. The numbering can be inserted before as well as after each access road or interchange.

7. In case the E-road changes over to another road or crosses another E-road it is recommended to indicate the relative E-road numbers before the access or the interchange.

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