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ROAD TRANSPORT INFRASTRUCTURE

European Agreement on Main International Traffic Arteries (AGR)

Consolidated text of proposals for amendments to the AGR, Annex II

Note by the secretariat

In order to ensure that the proposals for amendments to Annex II of the AGR are more intelligible and to facilitate their final adoption by SC.1 and the subsequent notification procedure, the secretariat has prepared a consolidated version of all the proposals, including those already adopted at its ninety-sixth session (TRANS/SC.1/371 and TRANS/SC.1/AC.5/36) and those proposed for adoption by the Working Party at this session (TRANS/SC.1/AC.5/38).

European Agreement on Main International Traffic Arteries (AGR)

Annex II

Conditions to be met by the main international traffic arteries

SUMMARY

Add to section IV (Equipment), subsection 4 (Traffic control and user information), paragraph “**4.4 User information**”.

Existing sections V (Environment and landscaping) and VI (Maintenance) become **sections VI and VII**, respectively.

Insert the following summary of new section V:

“V. MANAGEMENT, SAFETY EQUIPMENT AND GENERAL ARRANGEMENTS FOR TUNNELS

- 1. Traffic management systems**
- 2. Control centre**
- 3. Emergency exits and access for emergency services**
- 4. Tunnel equipment**
 - 4.1 Safety improvement and/or monitoring devices and systems**
 - 4.2 Ventilation systems and fire extinguishing devices**

Replace as follows the summary of existing section V (renumbered as VI):

- #### **VI. Environment and landscaping**
1. General remarks
 2. Integration of roads into the environment
 - 3. The main adverse effects of roads on the environment**
 - 3.1 Water pollution**
 - 3.1.1 Pollution during roadworks**
 - 3.1.2 Seasonal pollution**

3.1.3 Accidental pollution

3.1.4 Chronic pollution

3.2 Noise

3.2.1 Factors to be taken into account

3.2.2 Measures to be taken

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

...

II. CLASSIFICATION OF INTERNATIONAL ROADS

II.2 Express roads

Replace the existing text by the following:

“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.”**

...

III. GEOMETRIC CHARACTERISTICS

III.1 General considerations

In the second sentence, “Changes of category ... particular attention”, in the third paragraph from the bottom, add in the brackets after “interchanges” **“toll areas and frontier posts”**.

...

III.2.1 Basic parameters

Amend as follows the table on recommended minimum values for parameters of horizontal and vertical alignment:

Design speed		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
Minimum longitudinal gradient in 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.**

Amend the last paragraph of the section to read:

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

...

III.3 Cross-section between junctions

After the existing text, add the following paragraphs:

“In this respect, tunnels and bridges, structures which are an integral part of the road system, should, to the extent possible, have the same number of traffic lanes as there are before and after these structures.

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. A two-tube tunnel should be constructed if the road concerned has separated carriageways.

Emergency stopping places (lay-bys) should be provided at least every 1000 m in long bidirectional tunnels.”

III.3.1 Number and width of traffic lanes

Delete the second and third paragraphs.

...

III.5 Intersections

Before paragraph 1 of subsection III.5, insert the following definition:

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

III.5.1 Choice of type of junction

In the last paragraph, “The use of junctions ... to users”, replace “with traffic signals (three colour lights)” by “... **with traffic light signals (three colour system) ...**”.

...

III.5.3.2 Geometric characteristics

Amend the first sentence of the third paragraph to read:

“Horizontal curves shall be joined by **transition curves** of a suitable length. ...”

Add (c) at the end of this paragraph to read:

“(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.”

...

IV. EQUIPMENT

...

IV.3.1 Safety fences and barriers

Add as follows to the fourth paragraph:

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

...

IV.4.2 Variable traffic signs

In the English text replace “lines” by “**lanes**”.

...

IV.5 Road lighting

Replace the first sentence to read:

“Lighting is desirable at some special areas such as frontier posts, [...] tunnels, adjoining areas, interchanges with other **AGR roads, toll areas**, etc.”.

...

IV.6.3 Protection from animals

Amend the title of the chapter to read:

“**Protection from and of animals**”.

...

The existing sections V (Environment and landscaping) and VI (Maintenance) become sections VI and VII respectively.

Insert the following new section V:

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 shall be planned and indicated to users at diversion locations situated in advance of the tunnel.

V.2 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

It is recommended to provide emergency exits at a maximum distance from each other of 500 metres. The optimal distance between emergency exits should be decided case by case based on an assessment of the risk potential. 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, it is recommended that the other tube 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 service vehicles.

For twin-tube tunnels, it is recommended where possible, to foresee a crossing of the central reserve in front of the tunnel entrance.

V.4 Tunnel equipment

The safety equipment required in tunnels should be defined on the basis of a case by case evaluation of the risk potential of the tunnel under consideration.

A list of such equipment is provided below. Some of this equipment is intended mainly for long tunnels.

V.4.1 Safety improvement and/or monitoring devices and systems

In addition to the equipment already envisaged in other sections, the following additional equipment and/or devices also lead to improved safety in tunnels:

- Signs indicating escape routes, safety equipment (particularly extinguishers) and installations;
- Emergency calling posts;
- Radio installations or channel for use by fire brigades;
- Systems for video surveillance and automatic detection of fires;
- User information systems (radio, loudspeakers, variable message signs, alarm systems, etc.);
- Traffic lights and barriers to stop vehicles when necessary;
- Longitudinal and smoke velocity monitoring systems;
- Overheating control systems for heavy goods vehicles (to be installed outside tunnels);
- Road signs and/or markings in order to help drivers to maintain an adequate distance (in general, unless otherwise indicated, 20 to 50 metres) from the vehicle in front;
- Systems for detecting violations of traffic regulations particularly regarding speed limits and distance between vehicles.

V.4.2 Ventilation systems and fire extinguishing devices

Appropriate ventilation systems should be provided for air and for smoke control and extraction.

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 a serious incident.

Fire extinguishers should be installed at the entrance and inside tunnels at regular intervals. In addition, water supply for fire brigades should be provided.”

Replace the existing section V, renumbered as VI, by the following:

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, severance) 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 elements 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 nuisance, 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.

VI. MAINTENANCE (renumbered as VII)

VI.1 General considerations (renumbered as VII.1)

Add the following to the second paragraph of existing subsection VI.1:

“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**.”

Insert a new paragraph after the existing second paragraph of subsection VI.1 to read:

“The complete or partial closure of lanes in tunnels should be avoided. If maintenance work requires the closure of a lane in a tunnel, this closure should already be carried out outside the tunnel.”

In the English text, in the third paragraph of existing subsection VI.1, “Maintenance concerns ... building, etc.”, replace “building” by “**buildings**”.

VI.2 Maintenance management (renumbered as VII.2)

In the English text, at the beginning of the second sentence of the first paragraph of existing subsection VI.2, replace “facilities” by “measures”.
