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**REVISION OF THE CONSOLIDATED RESOLUTION
ON ROAD TRAFFIC (R.E.1)**

Speed

Note by the secretariat

The members of WP.1 will find below a draft text concerning speed prepared by the small group on “speed” (France (Chair), Portugal, Switzerland and the secretariat). On the basis of the structure proposed in document TRANS/WP.1/2005/15, this text will be included in chapter 1, section 1.1.

R.E.1: Section concerning speed

Chapter 1. General rules for behaviour in traffic

1.1 Speed

Statistics in all countries show that speeds over the permitted limits or speeds inappropriate to the state of the road or traffic conditions affect both the risks of accidents and the consequences of accidents. Put another way, speed causes accidents insofar as it reduces the possibility of manoeuvring in time to avoid the danger and exacerbates them, since the greater the speed the more violent the impact and the severer - not to say more dramatic - the consequences.

Some figures:

- Depending on the country, excessive or inappropriate speed is the origin of between 30 and 50% of fatal accidents;
- Excessive or inappropriate speed has dramatic consequences for pedestrians. The probability of a pedestrian being killed is multiplied by eight with an increase in impact speed from 30 km/h to 50 km/h;
- A 1% variation in average speed causes a 4% variation in the same direction (increase or decrease) in the number of fatal accidents;
- A reduction in speed of 10% leads to a 10% drop in minor accidents, 20% in serious accidents and 40% in fatal accidents.

Data concerning the effects of speed:

- Speed increases stopping distance (= reaction distance + braking distance), bearing in mind that a driver's reaction time to an unexpected event varies between 1 and 2 seconds:

Speed in km/h	Stopping distance on dry road (in metres)	Stopping distance on wet road (in metres)
50	26.5	40
90	71.5	130
100	100	150
130	136	250

- Excessive speeds contribute to the increase of polluting emissions and noise as well as the operating costs of the vehicle (increased fuel and oil consumption, more wear on tyres);
- The time gained by driving faster is minimal and overestimated; on a journey of 100 km, only 6 minutes are gained by driving at 150 km/h instead of 130 km/h;

- Speed increases the risk of mistakes and fatigue sets in more quickly;
- Speed requires still greater attention at night; since the passing beam only lights the road up to 30 m ahead, above 70 km/h an obstacle emerging into the lighted zone cannot be avoided;
- The faster the driving speed, the more visual perception is reduced; the field of vision is 100° at 40 km/h, but becomes 30° at 130 km/h;
- Speed affects the quality of life of the population, particularly in urban areas;
- The higher the speed, the less the tyres adhere to the road.

Factors influencing choice of speed:

Numerous factors influence drivers' choice of speed. These are:

- Aspects of the road affecting the driver:
 - Type (motorway, dual carriageway, country road, urban street ...)
 - Function (transit, local traffic, etc.)
 - Width
 - Number of lanes
 - Layout
 - Framework (tunnel, bridge)
 - Gradient
 - Road markings
 - State of surface, etc.
- Aspects of the vehicle affecting the driver:
 - Type
 - Weight/power ratio
 - Comfort
 - Sound-proofing, etc.

- Aspects of traffic affecting the driver:
 - Density
 - General speed
 - Composition
- Aspects of the environment affecting the driver:
 - Climate conditions
 - Time of day (day/night)
 - Landscape (plain, mountains, tourist spots, etc.)
 - Road lighting
 - Signs
 - Speed limits
 - Radars, etc.
- And, naturally, the following criteria affect the driver himself:
 - Age
 - Sex
 - Reaction time
 - Attitudes
 - Circumstances of the journey
 - Possible blood alcohol level
 - Presence of passengers
 - Perception of dangers
 - Sensation-seeking, etc.

The choice of an appropriate speed, however, basically depends on the driver's perception, leaving aside any psychological or subjective factors that may intrude (personal concerns, fear of arriving late, etc.); in order to select an appropriate speed, he must be in a position to estimate it.

Studies have shown that estimation of speed is essentially based on:

- Auditory information: absence of this information leads to underestimation of speed;
- Peripheral vision: wide roads with no reference points also lead to underestimation of speed.

The sensation of speed decreases in the course of driving and drivers always change their speed less than is necessary when they need to reduce or increase it.

The identification of variables affecting perception of speed enables the most dangerous places or those with problems to be identified:

- Places where speed is maintained unchanged for a long period;
- Points of transition involving significant speed adjustments, either because of changes in the road environment or because the rules of the road so require;
- Places where peripheral vision is reduced, particularly because of the lack of reference points.

In order to achieve the best possible results where speed is concerned, measures need to be taken to ensure that:

- Driver errors become less likely;
- It is less tempting or even physically impossible to break the speed limit;
- Errors and infringement of speed limits do not necessarily lead to an accident;
- If the accident cannot be avoided, infrastructure installations on the roadside do not exacerbate the situation but on the contrary absorb drivers' mistakes or limit their consequences.

In view of the above, the competent authorities are recommended to take the following actions:

(A) With regard to regulations:

- Establish general speed limits in terms of the type of road in question and its equipment (motorways, dual carriageways, ordinary roads, urban network), categories of vehicles (light vehicles, heavy vehicles, etc.), drivers (e.g. novice drivers) and weather conditions (rain, snow, fog...);
- Select as a criterion a limit that is not significantly higher than average traffic speed on the road;

- Establish local speed limits where the dangerous nature of the section or the regulation of the traffic requires, making sure that they are credible in order to have the support of the drivers in question;
- Clearly indicate local speed limits by means of appropriate signs respecting the principles of uniformity and consistency by applying the same criteria as for similar traffic conditions;
- For light vehicles, recommend the installation of speed-limitation devices or speed governors so as to help drivers better to observe speed limits.

(B) With regard to infrastructure design:

- Introduce a road network hierarchy in terms of the functions of each road (transit, local traffic ...);
- Ensure the homogeneity of traffic as far as possible in order to avoid speed discrepancies between different categories of vehicles (prohibition of slow vehicles in high-speed sectors);
- Ensure that infrastructure installations and the design of the road remove all uncertainty where drivers are concerned, i.e. by giving them means of easily identifying the type of road they are on and the type of users they are likely to meet;
- Implement measures obliging drivers to reduce speed. The efficiency of the measures to make a road quiet depends on the situation obtaining. For example, in an urban context, the measures most frequently introduced are:
 - residential zones/30 km/h zones;
 - traffic islands;
 - roundabouts;
 - speed-control bumps, etc.
- Ensure that roadsides are designed for safety in order, if necessary, to mitigate the consequences of any mistakes by drivers if they come off the road.

(C) With regard to checks/penalties:

Make speed checks an essential element of observing speed limits by giving drivers the impression that they may be checked at any time (see also the chapter on “Roadside checks”).
