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Safety measures to be taken at level crossings on lines operated from 120 to 200 km/h

Mesures de sécurité aux passages à niveau situés sur des lignes parcourues à des vitesses comprises entre 120 et 200 km/h
Sicherung von Bahnübergängen auf mit 120-200 km/h betriebenen Strecken

UNION INTERNATIONALE DES CHEMINS DE FER
INTERNATIONALER EISENBAHNVERBAND
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Summary

This leaflet completes the *UIC Leaflet 761* with information to be considered when installing a level crossing system on lines with speeds above 120 km/h. Thus the leaflet gives an overview of methods which may be used by railways in such a case.

An introductory part justifies the need to limit the number of level crossings on lines operated at speeds above 120 km/h.

The main section provides conditions for warning signals (lights, barriers) that should be taken into consideration.

The last section makes recommendations in case of a connection with a traffic control center and for optimizing the warning time.

This leaflet has no mandatory status, in case of discrepancy with values indicated in the present leaflet, national low limites are binding.

1 - Definition and scope

With increasing train speeds, the existence of level crossings, as conceived when the railways were built, heightens the complexity of problems relating to safety and the scheduled running of rail and road traffic. For this reason, a speed limit of 200 km/h has been fixed, above which level crossings can no longer be tolerated.

National values are not indicated in the present leaflet. In case of discrepancy with values indicated in the present leaflet, national values limits prevail.

2 - Foreword

2.1 - When considering an operating programme for train speeds above 120 km/h, it is desirable, in tackling the problem of level crossings, to examine the practical possibilities of eliminating all those points where rail and road cross at the same level. The following criteria should be used as a basis for prioritising level crossing for:

- elimination of dangerous crossings with heavy and/or slow-moving road traffic, and crossings where the passage of heavy vehicles and exceptional loads occurs with statistical frequency;

- elimination of level crossings in cases where even a small profit emerges in terms of annual savings comparing attendance and maintenance costs with the investment required for the construction of bridge or road diversions;

- elimination of private or rarely used level crossings, and as far as possible, of level crossings reserved for pedestrians.

2.2 - Level crossings with no technical protection should not be allowed on lines operated by speeds above 120 km/h.

3 - Technical provisions

3.1 - Warning devices

3.1.1 - Automatic equipment only should be used. The type of warning device adopted will depend on the train speed, the type of vehicle crossing (slow, heavy), etc.

3.1.2 - Three types of warning devices are to be considered:

- warning devices consisting only of a light signalling system with flashing red lights;
- half barriers;
- full barriers.

3.2 - Road light signalling

Automatic equipment consisting only of a road light signalling, without barriers, should be permitted only exceptionally and under very restrictive conditions up to 140 km/h.

3.3 - Barrier systems

3.3.1 - A barrier system supplementing the road light signalling is recommended for speeds above 120 km/h, since it is a material obstacle preventing access to the crossing zone.

3.3.2 - Two types of barrier system are possible:

- half barriers, shutting off a part of the road (the driving direction);
- full barriers, shutting off the whole width of the road.

3.4 - Half barriers

The half barrier system supplementing the road light signalling is considered acceptable up to 160 km/h.

Half barriers can still be used above 160 km/h (see point 3.5.2 - page 5).

3.5 - Full barriers

3.5.1 - The full barrier system supplementing the road light signalling is recommended for speeds above 160 km/h. The full barrier system can consist of 2-4 barriers, depending on the width of the road.

3.5.2 - Instead of using full barrier warning devices, although less effective, the exit barriers can be replaced by an island in the road separating the two traffic directions, in order to prevent vehicles from zigzagging over the crossing when the barriers are lowered.

3.6 - Barrier breakage control

A barrier breakage control may be provided. This type of device is recommended for speeds above 120 km/h.

3.7 - Obstacle detectors

3.7.1 - An obstacle detector incorporated properly into the full barrier system can effectively improve the operational safety. The obstacle detector is recommended for train speeds above 190 km/h or when the vehicles crossing are slow and there is a risk of vehicles blocking (queuing on) the level crossing.

3.7.2 - The function of obstacle detector can also be done by CCTV (closed circuit television) supervised by the signaller.

3.8 - Automatic Train Protection system (ATP)

For train speeds above 160 km/h, communication with the ATP system is recommended. For full barrier warning devices, this option can be considered starting at a speed of 140 km/h.

4 - Common requirements for all types of warning devices

4.1 - Connection to other signalling systems

It is considered beneficial to obtain proof of proper functioning of the automatic installation from a control centre.

4.2 - Warning time

Any complete standardisation of warning times runs counter to essential safety requirements if one considers the case of a train increasing speed when approaching the level crossing after passing the strike-in point. However, partial standardisation for a limited number of speed ranges can be introduced, with full regard to safety, and without too many technical difficulties, the result increasing in value with the difference between the maximum speeds of the trains using the line. See also *UIC Leaflet 761* (see Bibliography - page 7).

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