Economic Commission for Europe

Inland Transport Committee

Working Party on Road Traffic Safety

Group of Experts on Improving Safety at Level Crossings

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Best/good practices to improve level crossing safety

Submitted by Finland and India

This informal document submitted by Finland and India provides a summary of the GE.1 survey findings related to best/good practices from ECE member States (sub-categorized according to EU and non EU countries), and India

The best/good practices to improve level crossing safety differ from country to country as well as concerning suitable solutions for different types of level crossings. The summary of best/good practices is based on the answers we received from the questionnaire launched by this expert group. Most of the best/good practices are the expert opinions without any other evaluation or the evaluation is based on accident statistics. In some countries the evaluation is based on the accident investigation reports (causes for level crossing accidents) or risk models. Sometimes the outcome of the evaluation is not yet available due to the early stage of the measure or is not publicly available. We did not receive any information on e.g. impact assessments or before-after studies.

Request: Measures evaluated by research (links or summaries)

Action: Taking into account the work of other subgroups (e.g. human factors)

Best/good practices under European Union safety regime

We received the majority of answers from the countries under the European Union safety regime (total 14 countries). Safety improvement measures have been sorted under Elimination, Engineering, Education, Enforcement and Endorsement. In general best/good practices should give appropriate information to user and encourage safe behavior and put users in position to see approaching trains without being in danger.

Elimination

The elimination of level crossings was mentioned in half of the answers. In addition to that it was mentioned that new level crossings should not be built. If elimination is not possible the upgrading of the crossing was mentioned as best/good practice. Also rerouting the traffic to the level crossing equipped with barriers was considered as best/good practice.

Engineering

Some type of engineering solution was seen as a best/good practice measure in almost all of the answers received from the countries under EU safety harmonization regime.

Upgrading the level crossings from passive to active with barriers was considered the best/good practice and also upgrading the crossings equipped with flashing lights and bells to crossings with barriers (part of the road users misunderstand the flashing red lights and interpret them as warning). Crossings with barriers were suggested to be interlocked to signals and if there is a road junction with traffic lights nearby, also to that one. The best/good practice solution would be to make the barriers look fence-like with attaching chains or other structural solutions to the barriers. Upgrading the crossings with half barriers to full barrier crossings (full barriers also for pedestrians and bicyclists) and equipping the signals and barriers with LED lights were seen as the best/good practice measure.

If it is not possible to equip the level crossing improving of sightings or use of rumble strips were seen as best/good practice solutions. From the stop point there should be an unobstructed sight along the railway.

Other measures estimated to be the best/good practice solutions included monitoring of the level crossing with CCTV, obstacle detection, an online form for reporting a fault with equipment and traffic lights some metres before the level crossing.

Education

Education and raising awareness was mentioned in half of the answers. Especially lectures for children and awareness campaigns for the road users at harbours were considered to be the best/good practice measures. Rising of the awareness on the proper behavior when trapped between the barriers is mentioned as the best/good practice.

Enforcement

Three respondents considered the enforcement to be a best/good practice solution. In one answer it was considered that enforcement may create bad feelings, is expensive and may not change behavior.

Evaluation

Different types of evaluation were considered as the best/good practices in four answers. These included level crossing inspections during which the technical condition of the level crossing is checked, impact assessment, evaluation of legal framework/regulations based on risk monitoring and cost-benefit-analysis.

Endorsement

The endorsement measures include rail traffic improvement program, having all the level crossing issues under national law (technical issues, obligations of road and rail and the consequences when the law is offended), knowledge on the exact number of level crossings and their type and frequent risk assessment.

Justification

The measures considered to be best/good practice solutions to improve safety at level crossings were usually estimated to be that because they either offered engineering solutions to enhance the proper behavior of road users and to make it clear on how to behave (e.g. physical separation) or the accident statistics show a decrease in the number of accidents. Education of children was deemed effective because they are the future drivers.

Risk based approach was seen essential for identifying and evaluation of safety level, deciding the need of action, estimating and monitoring the impact of foreseen measures and evaluating of regulations / legal framework. In addition risk analyses (even simple ones) were seen essential for prioritising the investment and they should be done frequently.

Challenges

It is difficult to get 'buy-in' from road authorities, who have different priorities and engage individual road users.

Open crossings with warning only and crossings with automatic half-barrier systems are found to be particularly risky when installed on 'through roads', due to traffic speed, frequency of use, failure to see warnings, stop on crossing and avoiding barriers.

Best/good practices in other countries

We received the answers from six other countries. In Moldova they are trying different solutions at 20 level crossings to improve safety. The best/good practices have not yet been

identified. In India the circumstances are different from other countries that responded to the questionnaire. The best/good practices in India are therefore described separately.

Elimination

The grade separation and elimination of passive level crossings were seen as the best/good practice measures because they improve safety, reduce maintenance costs and increase the capacity. If the over or under passes are built, the crossings within a five km area from the grade separated crossing should be eliminated.

Engineering

Equipping of the level crossing with barriers (including so called lying policeman) was seen as the best/good practice measure as well as installing of technological protection measures not allowing the vehicle to enter to the private crossing (reduces the number of incidents).

Creating a communication system between train driver and level crossings was seen as the best/good practice because the train driver will be able to notice if the crossing is working properly.

Enforcement

The installation of video cameras to the level crossing was seen as the best/good practice because the cameras scare drivers and thus reduce the number of incidents. The best/good practice is also increasing penalties and publishing the serious accidents.

Endorsement

The national legislation including the measures to improve existing level crossings, the prohibited locations for level crossings, the distance between the level crossings and signing standards was considered to be the best/good practice measure.

Challenges

The effective measures to prevent suicide are hard to find.

The level crossings with flashing red light and warning sounds without barriers are not a good solution due to the lack of education and knowledge on level crossings. The road users are failing to comply with these warnings.

India

In India the best/good practices are different from the other responding countries because of the huge number of inhabitants of which 69% are living on the rural area and with the national average of literacy being 74%. There are 23 official languages. The best/good practices include elimination, education, engineering and enforcement. The evaluation of measures is based on data collection.

Elimination

Elimination of unmanned level crossings is the best/good practice measure (total 30348 LC, 18725 manned, 11563 unmanned at 1 April 2014) as well as grade separation with over and under passes.

Education

Education programs are targeted to rural area and must be easy to comprehend. At primary level education on railway safety (especially level crossing safety) is included in syllabus. For small children and illiterate adults there are street shows in their own language. A best/good practice measure is also giving information during social festivals and mass gatherings (e.g. Maha Kumbh Mela with 100 million people attending). Safety campaigns with SMS messages, printed safety bulletins in 23 official languages, leaflets are also amongst the best/good practices.

Most of the level crossings are located on the rural and remote areas and the effective method to improve level crossing safety should be based on mass contact and bring out a behavioral change. Methods like education in school, street shows, mass contact in the Fares (Melas), etc. are found to be very helpful and cost-effective techniques.

Engineering

The best/good practices for engineering include whistle boards 600 m before the crossing, rumble strips and speed humps and manual barriers interlocked with signals. There is a trial on repeated whistle board 300 m before the crossing.

Enforcement

The safety drives with regional and local police to enforce and remind on proper behavior are found as the best/good practice as well as the road safety counselors (employed by railways) warning and sensitizing road users. The latter will be extended.

Challenges

Installing device (e.g. warning device, lights) to unmanned crossings is found unsuccessful because the devices tend to be stolen.

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