



Trafı

Finnish Transport Safety Agency

Good practices to improve level crossing safety

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*Responsible traffic.
Bravely together.*

Data

- Survey
 - Expert opinions
 - Partly depending on the organisation of respondent
- Finnish study
 - 37 measures
 - Data on safety impact collected from international research

Good practice table



16.6.201

Good practice table

- Updated based on the data and the comments received from the members of GE.1
- Comments received from Austria, Belgium, ERA, France, Hungary, India, Ireland, Israel, Sweden
- Thank you for the comments!



For discussion

- Warning measure ↔ safety measure
 - Warning measures are there to improve the safety
 - Not to be considered as safety devices according to the standards and regulations
- Updating passive crossing to active
 - Suggestion for adding "passive to light signal and `sound warning"
 - Is it really a good measure?
 - Those types of crossings are overrepresented in the accident statistics in many countries
 - Many countries have a principle of not using that measure any more (adding barriers or doing some other measure to change the type of the crossing)

For discussion (cont.)

- New measures with research needs
 - Suggestion: to be included with the mention that more research is needed
 - Question: Need to change the in-vehicle warning to bringing the same information with modern data transfer techniques to the level crossing itself?
- Updating the present devices with modern technology
 - Need to be agreed, now added to the table

Good Practice	Specific Measures (if applicable)	Pros	Cons	Other Relevant Factors or Comments
Withdrawal of level crossings	<p>Closing the crossing</p> <p>Building over/underpasses</p> <p>Rerouting the traffic to the remaining crossings</p> <p>Reduce the number of level crossings by reorganising rural (agricultural, forest, service) road network</p> <p>Make the LC unneeded by buying land from a land owner</p>	<p>Removes the safety problem locally</p> <p>Reorganization an effective solution.</p> <p>No maintenance costs</p> <p>No need to increase the LC protection</p>	<p>Increase of transport internal and external costs</p> <p>High costs</p> <p>May not be physically possible considering the local road conditions etc</p> <p>Local road users want to keep the LC and appeal to the court</p> <p>Land owners do not want to give up land for a new parallel road (to another LC)</p>	<p>For safety impact the high risk crossings need to be removed. Assuring that the safety of nearby crossings or road network is not decreased.</p> <p>Paying compensation (once) for the detour may be needed</p>

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Good Practice	Specific Measures (if applicable)	Pros	Cons	Other Relevant Factors or Comments
Installation of active protection devices	Full road and rail side protection Passive to full or double barriers Passive to half-barriers Passive to active with low cost measure New technology solutions (e.g. in-vehicle warning)	Highest level of protection Safety is improved, especially on high risk roads Low cost warning measures working e.g. with solar panels	High costs Installing barriers has high costs and equipment needs power supply Risk of blocking back of the vehicle Costs for the design, construction, review, approval	Also assures that LC is obstruction free The safety impact is different for different types of warning devices. Double and half-barriers not applicable for small rural roads Research on new technology solutions needed , including usability/practicability issues and human factors analyses

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Good Practice	Specific Measures (if applicable)	Pros	Cons	Other Relevant Factors or Comments
Making road users aware of proper and safe behaviour at level crossings	Education at schools and driving schools Awareness campaigns Social media campaigns Leaflets etc. Giving information at fairs and other mass gatherings Information board near each LC to inform the road user about proper behaviour and e.g. not blocking back	Effect on the behaviour of the road users	Different solutions must be prepared, because people are different (age, education, etc.) It takes relatively long time. Competition with other campaigns etc	Target groups need to be considered carefully Safety impact not really known, more research needed

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Good Practice (this is where the broad headings go)	Specific Measures (if applicable)	Pros	Cons	Other Relevant Factors or Comments (Subgroup and GE.1 to suggest)
Improving the surroundings at level crossing	Preventing driving around the barriers (e.g. installing plastic pole in the middle of the road upstream of the LC; adding an extension to the barrier) Having separate pedestrian and bicycle ways Speed humps Rumble strips where applicable Stop line at decision point Improving visibility Improving road geometry	Speed reduction effect Safer for road users Instantly recognisable Cutting vegetation is cheap	Potential problems with winter maintenance Not applicable near the residential areas, noise Needs maintenance	Safety impact and costs depend highly on the measure Need for road and rail infrastructure managers to cooperate Good safety impact and low cost

Good Practice	Specific Measures (if applicable)	Pros	Cons	Other Relevant Factors or Comments
Enforcement and policing	Police presence Speed cameras at crossing Red light cameras at crossing Speed and/or red light cameras in the police vehicle	Dissuasive effect	High costs	Quite new measure, safety impact not known, needs research on effectiveness of each measure
Updating the present devices with modern technology	New types on LC equipped with LED road signals and reflecting barriers in order to increase visibility near LC LED on the barriers LC in order to increase visibility Replacement of old mechanic bells by new electronic bells			

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For discussion

Good Practice	Specific Measures (if applicable)	Pros	Cons	Other Relevant Factors or Comments
Improved IT systems in order to collect all data on level crossings in one place		All staff can quickly obtain information about level crossings	Costs for the system	
Not allowing increases in speed or capacity on the railway before level crossings have received better protection				
Monitor changes in society that will lead to changes in road traffic	Examine the municipalities' detailed development			

Suggestion: To be added

Good Practice	Specific Measures (if applicable)	Pros	Cons	Other Relevant Factors or Comments
Systematic risk management by infrastructure managers	<p>Established Safety Management System</p> <p>Systematic risk assessment based on common criteria</p> <p>Risk monitoring through reporting of accidents and incidents (including near misses reporting by train drivers)</p> <p>Safety oversight (audit, assessment of procedures and or the infrastructure)</p>	<p>Universal and easy to implement</p> <p>Leads to more efficiency and effectiveness</p> <p>Provide evidence of the problem size</p>	<p>Little expertise, especially on road side</p> <p>Common criteria often missing</p> <p>Need resources</p>	<p>Documented systematic way of managing risk</p>

For discussion

Good Practice	Specific Measures (if applicable)	Pros	Cons	Other Relevant Factors or Comments
Strategy and improvement programme	Strategy defined Political and companies' commitment Programme detailing the actions and budget	Effective and cheap	Need structure for support Difficult to sustain in a longer term	
Vehicle passive safety improvement	Road vehicles: active and passive safety Rail vehicles: passive safety – design of the front of the train	Effectively mitigate the seriousness of impact	Expensive	Currently not considered by international or other standards

Next steps

- Possible addition of new measures from HF subgroup
- Updating and finalising the recommendations table
- Updating and finalising the report based on the comments received



Thank you!



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Enabling safe performance at level crossings

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