An Coimisiún Sábháilteachta Iarnróid
Railway Safety Commission

RSC-G-012-A
Third Party Guidance on Railway Risk
Volume 3 Crossing the Railway

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The Railway Safety Commission is grateful for the help of Sotera Risk Solutions Ltd. (www.sotera.co.uk) in the drafting of these Guidelines.

1 INTRODUCTION

1.1 WHO HAS PUBLISHED THIS GUIDANCE AND WHY?

This document has been published by the Railway Safety Commission to show all external parties how their various activities might affect railway safety. It also deals with how these risks can be controlled.

1.2 WHO SHOULD READ THE GUIDANCE?

The guidance covers all passenger and third party actions that might affect railway safety. This volume covers the actions of those crossing the railway at a bridge or level crossing.

1.3 WHAT DOES THE GUIDANCE COVER?

The guidance is applicable to the mainline railway, Luas, heritage railways and the Bord na Móna industrial railway system (where it comes into contact with public areas).

1.4 PASSENGER AND THIRD PARTY RISK

Some railway dangers are solely the responsibility of the railway company. Examples include collisions between trains and derailments. However, the risk from such types of accident accounts for only about 10% of the total safety risk. Passengers and third parties must play their part to control the remainder of risk on the railways.

1.5 PASSENGER AND THIRD PARTY GUIDANCE

Volume 1: Planning and Development.
Volume 2: Neighbours.
Volume 3: Crossing the Railway.
Volume 4: Passengers.
Volume 5: Emergency Services.

A risk rating has been provided, for each activity and hazard, using a thermometer symbol. The higher the thermometer level, the higher the risk involved.

Find the relevant guidance for you and your activities on the next page.

Figure 1 Level Crossing Users – page number for guidance on each activity

	Person				
Activity	Any level crossing user	Any bridge user	Farmer	Drivers of abnormal vehicles or loads	Open top bus operator

Using any level crossing	6		6	6	6
Crossing at protected level crossing	8		8	8	8
Crossing at unprotected level crossing	13		13	13	13
Taking animal(s) across a crossing			19		
Harvesting that involves crossing the railway using an iron gate crossing			20		
Driving an abnormal vehicle or load across a crossing			21	21	
Driving open top double decker bus across crossing				23	23
Crossing the Luas	24			24	
Driving under or over a bridge		27	27	27	
Reporting incidents, injuries and substandard conditions	30	30	30	30	30

2 LEVEL CROSSING GUIDANCE

There are two main categories of crossing:

- **Protected crossings:** where the railway company gives an indication to the user when it is safe to cross.
- **Unprotected crossings:** where the users are wholly responsible for their own safety.

Further guidance is given on these crossing types in *Sections 2.1* and *2.2*. Further guidance is also given for particular user activities in *Section 2.3*

- Taking an animal across a crossing
- Driving an abnormal vehicle across a crossing
- Operating an open top bus.

The principles of keeping safe are summarised for these crossing types:

Golden Rules for Safety at Protected Crossings

- Obey all road signs.
- If there are road traffic light signals, obey them.
- If there are barriers or gates across the left-hand side of the road, do not attempt to cross the railway.
- If barriers begin to lower when you are on the crossing, continue to cross as quickly as you can.
- If you get caught between the gates/barriers on each side of the railway, get out of the vehicle and get as close to the gate as possible and if there is a telephone in a yellow box, use it to phone the railway operator.

Golden Rules for Safety at Unprotected Crossings

- Any gates or barriers should be kept closed and secured across the road except when someone wishes to cross the railway.
- Even if a gate is open or opened for you, you are still responsible for your own safety when crossing the railway.
- Stop, look and listen to see if a train is coming before attempting to cross.
- Get a copy of the Iarnród Éireann booklet, *'The Safe Use of Unattended Railway Level Crossings'* from Principal Engineer Track and Structures (see *Section 6* for contact details) and take note of its contents.

The vast majority of accidents at level crossings occur because the rules described above are not followed. In particular, **you should not**:

- Assume it is safe when one train has passed. Be aware that a train which has crossed in one direction could be blocking the view of a train approaching in the other direction.
- Assume it is safe to cross if a gate on an 'iron gate' crossing has been left open.
- Cross if in doubt as to whether it is safe.
- Drive around barriers as they are lowering or rising.
- Overtake at a crossing.
- Drive onto the crossing until the road is clear on the far side.
- Stop or park on, or near, a level crossing.
- Rely on train timetables for knowledge of when the train is coming.

Wheelchair users and cyclists should always take care and travel straight across the railway to prevent getting their wheels caught in the gap between the rail and the crossing surface. Cyclists are advised to dismount. Be aware that the train may sound its horn approaching the crossing, which may startle horses or other animals.

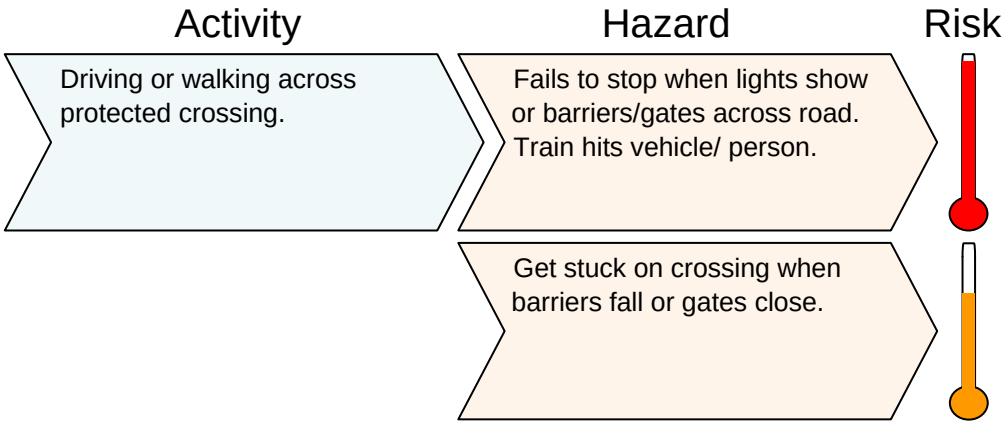
If your vehicle breaks down or you have an accident on a crossing, **you should**:

1) Get everyone out of the vehicle and clear of the crossing immediately.
2) Use a railway telephone (if available) or ring central traffic control (see *Section 6* for contact details) to contact the signalman as follows:
3) Identify yourself, your location and your status (e.g. level crossing user etc.)
4) State "This is an emergency call"
5) Clearly state:
   - The level crossing number and the line (if known)
   - Nature of emergency e.g. car stuck on line
   - Required actions e.g. stop trains
6) Give your name and contact details in case further information is required.
7) Follow the directions of the signalman.

If a level crossing is damaged or is not working you should contact central traffic control immediately (see *Section 6* for contact details) to inform them of the failure.

2.1 *PROTECTED CROSSINGS*

In this category of crossing, the railway is responsible for the safety of crossing users. Safety protection comes in the form of traffic light signals or gates/barriers operated by railway company personnel (or sometimes a combination of both). Users are responsible for obeying indications and making their own observations. The main activities and hazards for anyone using of a protected crossing are summarised below.



The types of protected crossings are

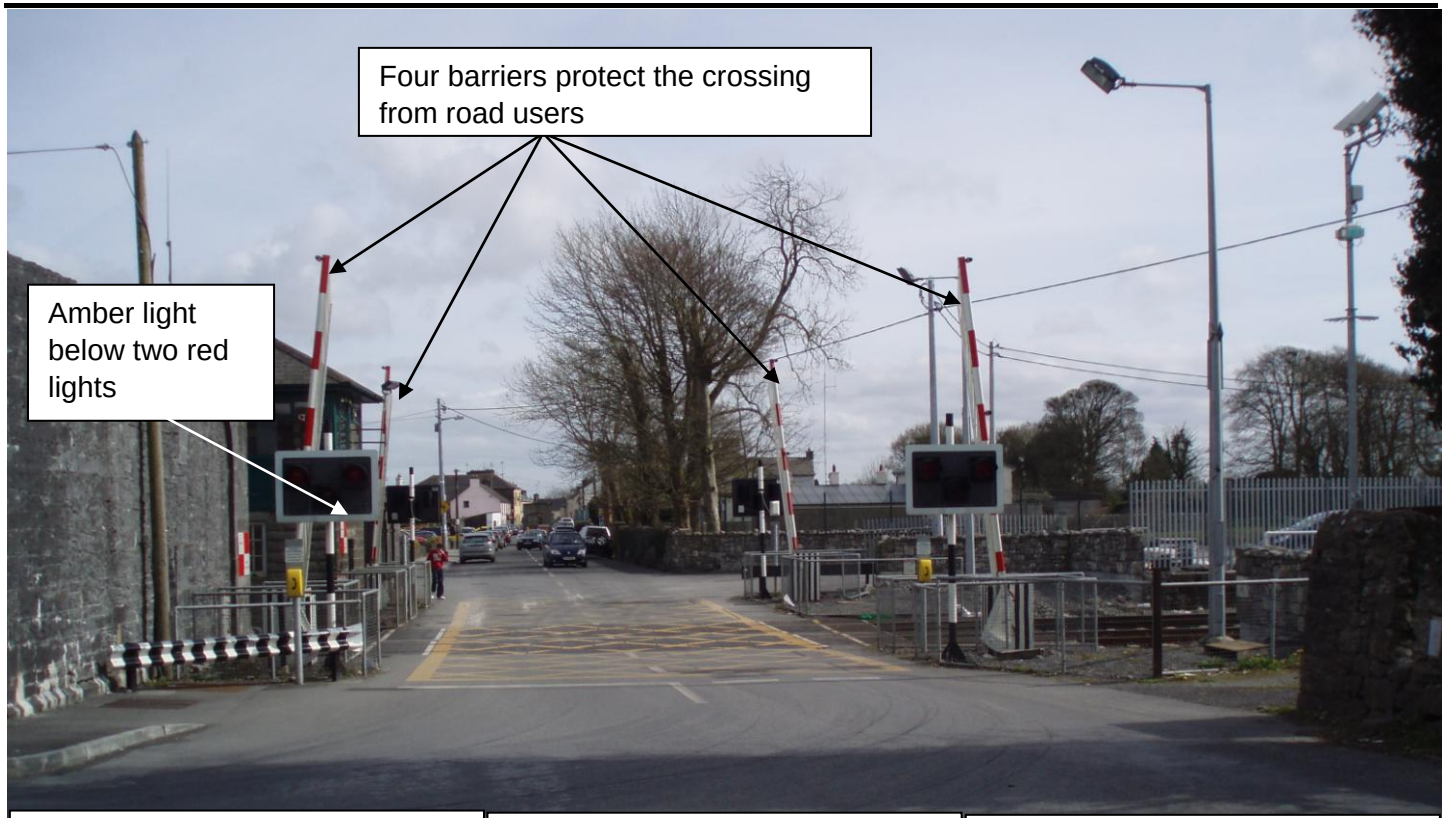
- Full (four) barrier crossings.
- Half (two) barrier crossings.
- Open (lights and bells) crossings.
- Striped gates crossings.

The operation of these crossing types are shown in *Figure 2* to *Figure 5* with guidance on how to use the crossings. You should always obey the crossing indications and signage. If lights show for a long time, use the yellow phone provided to contact railway staff.

If you get stuck on the crossing when barriers fall, you should move clear of the path of the train and use the yellow telephone provided to contact railway staff and keep clear of the path of the train.

There may be a separate gate for pedestrians adjacent to a protected type of crossing. The use of this gate is **unprotected** and users should follow the guidance in *Section 2.2* for unprotected crossings.

Figure 2 Full (Four) Barrier Crossing



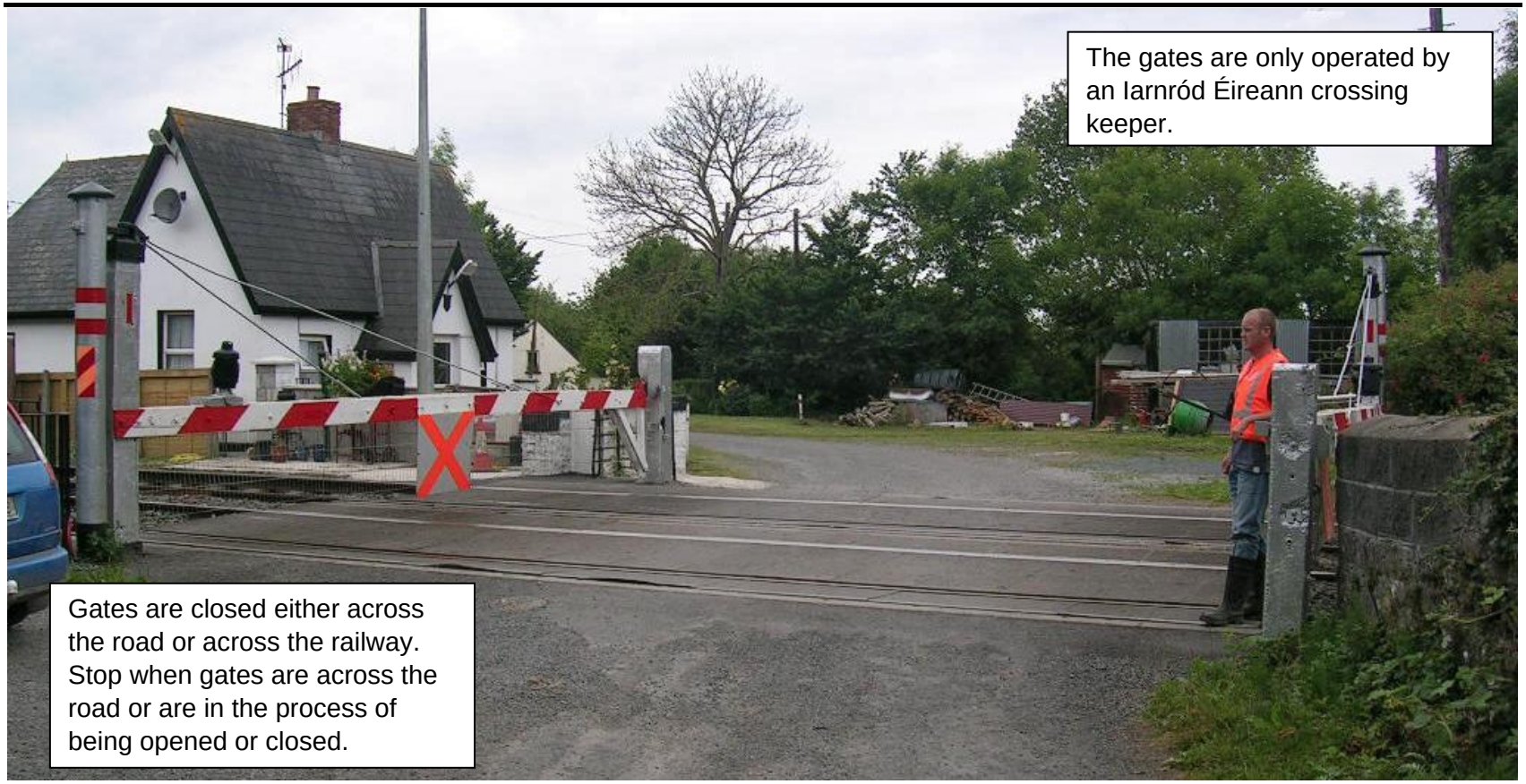
1	2	3
Lights come on (amber first followed by flashing red) and audible warnings sound to warn that barrier is about to lower. **Stop when lights show.**	The barriers lower, nearside lane first and red lights continue flashing.	The barrier goes up and the red lights stop. The road user can go when the barrier has raised **and** the red lights have stopped.

Figure 3 Half (Two) Barrier Crossings

1	2	3
Lights come on (amber first followed by flashing red) and audible warnings sound to warn that barrier is about to lower. **Stop when lights show.**	The barriers lower and red lights continue flashing.	The barrier goes up and the red lights stop. The road user can go when the barrier has raised **and** the red lights have stopped.

Figure 4 Open (Lights and Bells) Crossings

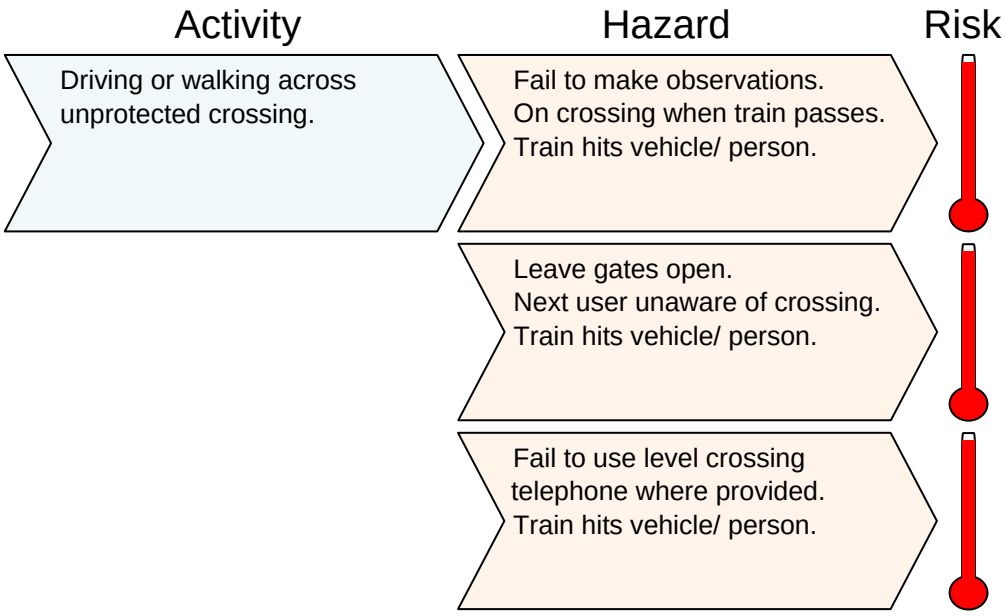
Figure 5 ***Striped Gates Crossings***



2.2 *UNPROTECTED CROSSINGS – USER WORKED LEVEL CROSSINGS*

This category of crossing has gates, which have to be opened and shut by the user. Some footpath crossings only have stiles. All have signs, which give warnings and instructions to users.

The main activities and hazards for anyone using an unprotected crossing are summarised below.



The types of unprotected crossings are:

- Iron gated crossings, and
- Footpath crossings.

These crossing types are shown in *Figure 6* to *Figure 9* with summary guidance for someone driving a vehicle across the crossing.

Comprehensive guidance for the safe use of unprotected level crossings is available in an Iarnród Éireann booklet: *The SAFE use of Unattended Railway Level Crossings* (1). Any regular user of such level crossing types should already be in possession of this booklet. It is available from the local Divisional Engineer (for contact details see *Section 6)*.

(1) Reference [K]: Iarnród Éireann booklet : The SAFE use of Unattended Railway Level Crossings.

Some iron gate crossings are attended at busy times. Even if attended, the use of the crossing is the same. Modern trains travel very quickly and silently but can take a long distance to stop. You should always stop, look and listen in accordance with the booklet and never cross if you see the train approaching.

A DVD: *Your Safety on the Level* is also available to be viewed on the Iarnród Éireann website (www.irishrail.ie) together with directions how to obtain the DVD.

Leaving gates open is a trap for the next level crossing user as they can come upon the crossing without realising that there is a hazard. Leaving the gates of a crossing open is also an offence. You should always close the level crossing gates immediately after use.

If your view up the track at a level crossing is being obscured by vegetation, you should contact your local divisional engineer to cut back that vegetation (see *Section 6* for contact details).

If an iron gate crossing has been provided with telephone, you must always use the telephone prior to crossing.

Figure 6 Iron Gated Crossing on Road (unattended)

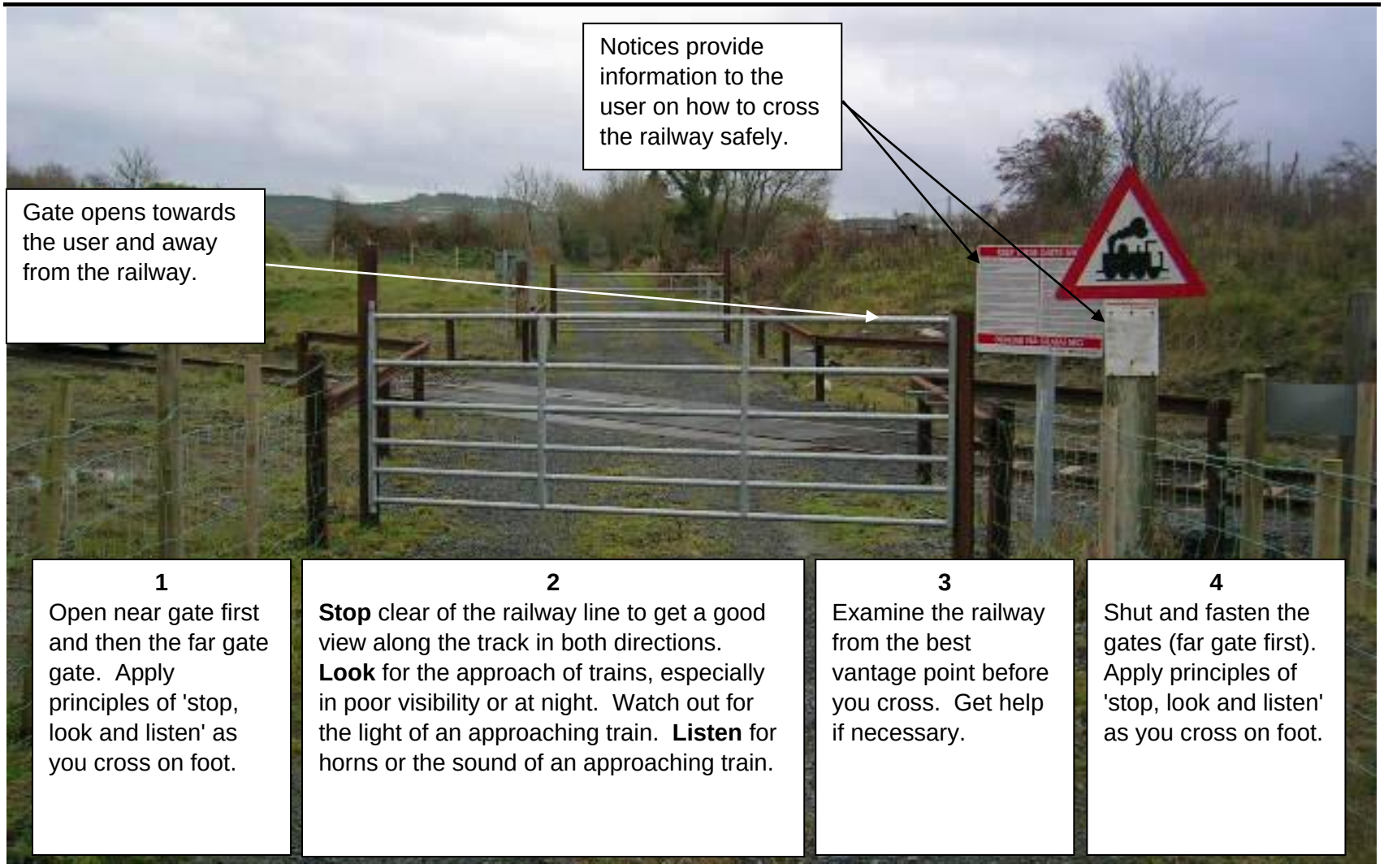


Figure 7 Iron Gated Crossing (Field)

1	2	3	4
Open near gate first and then the far gate gate. Apply principles of 'stop, look and listen' as you cross on foot. Telephone if appropriate.	**Stop** clear of the railway line to get a good view along the track in both directions. **Look** for the approach of trains, especially in poor visibility or at night. Watch out for the light of an approaching train. **Listen** for horns or the sound of an approaching train.	Examine the railway from the best vantage point before you cross. Get help if necessary.	Shut and fasten the gates (far gate first). Padlock field crossings when not in use Apply principles of 'stop, look and listen' as you cross on foot.

Figure 8 Iron Gate Crossing on Public Road (Attended)

1	2	3	4
Open near gate first and then the far gate gate. Apply principles of 'stop, look and listen' as you cross on foot.	**Stop** clear of the railway line to get a good view along the track in both directions. **Look** for the approach of trains, especially in poor visibility or at night. Watch out for the light of an approaching train. **Listen** for horns or the sound of an approaching train.	Examine the railway from the best vantage point before you cross. Get help if necessary.	Shut and fasten the gates (far gate first). Apply principles of 'stop, look and listen' as you cross on foot.

Figure 9 Iron Gate Crossing and Pedestrian Crossing

1	2	3	4
Open near gate first and then the far gate gate. Apply principles of 'stop, look and listen' as you cross on foot.	**Stop** clear of the railway line to get a good view along the track in both directions. **Look** for the approach of trains, especially in poor visibility or at night. Watch out for the light of an approaching train. **Listen** for horns or the sound of an approaching train.	Examine the railway from the best vantage point before you cross. Get help if necessary.	Shut and fasten the gates (far gate first). Apply principles of 'stop, look and listen' as you cross on foot.

2.3 HAZARDOUS LEVEL CROSSING ACTIVITIES

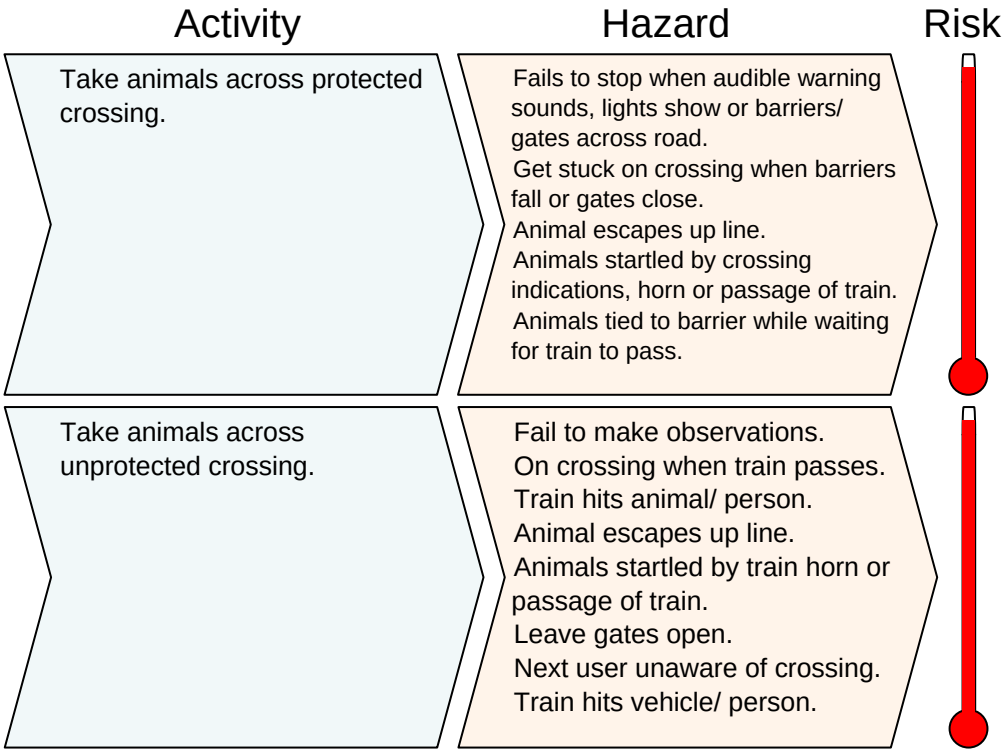
All users should obey the advice when using level crossings as described in *Sections 2.1* and *2.2*. The nature of some activities introduce particular hazards:

i) Taking animal(s) across a crossing
ii) Harvesting that involves crossing the railway using an iron gate crossing
iii) Driving an abnormal vehicle or load across a crossing
iv) Driving an open top double decker bus across a crossing.

These are described in the following sections.

Taking Animal(s) across a Crossing

The particular activities and hazards for taking an animal or animal(s) across a level crossing are summarised below.

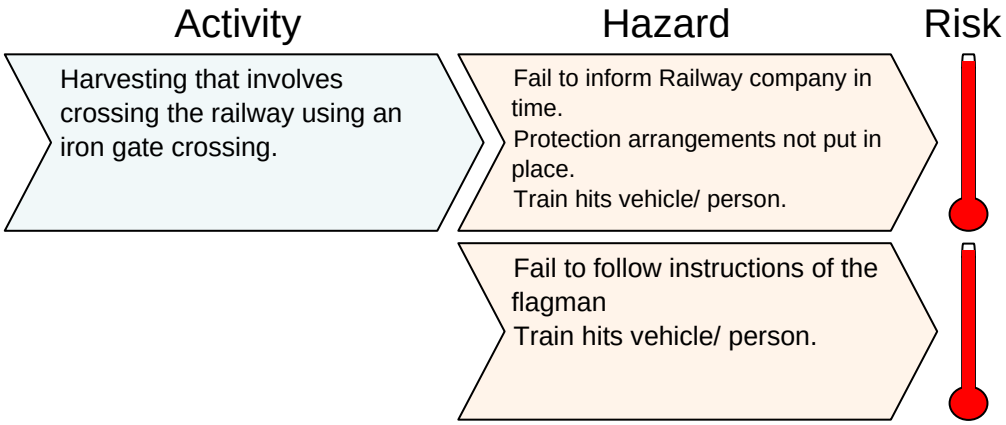


As well as obeying the advice for any user at protected (see *page 8*) and unprotected (see *page 13*) level crossings, those in charge of animals should:

- Follow the additional advice given in the Iarnród Éireann booklet: *The SAFE use of Unattended Railway Level Crossings* (2) on herding animals across a level crossing;
- Prevent animals escaping up the line at a level crossing and contact central traffic control immediately if an animal does escape;
- Be aware that animals might be startled by the crossing or the passage of the train. Riders should dismount while waiting for the train to pass and when crossing;
- Be aware that the barriers may rise abruptly and without warning. Never lean on or tie anything to the barriers when they are down.

Harvesting that involves crossing the railway using an iron gate crossing

The particular activities and hazards for special farm activities such as silage making, hay making or harvesting, which involve making repeated use of an iron gate level crossing are summarised below.

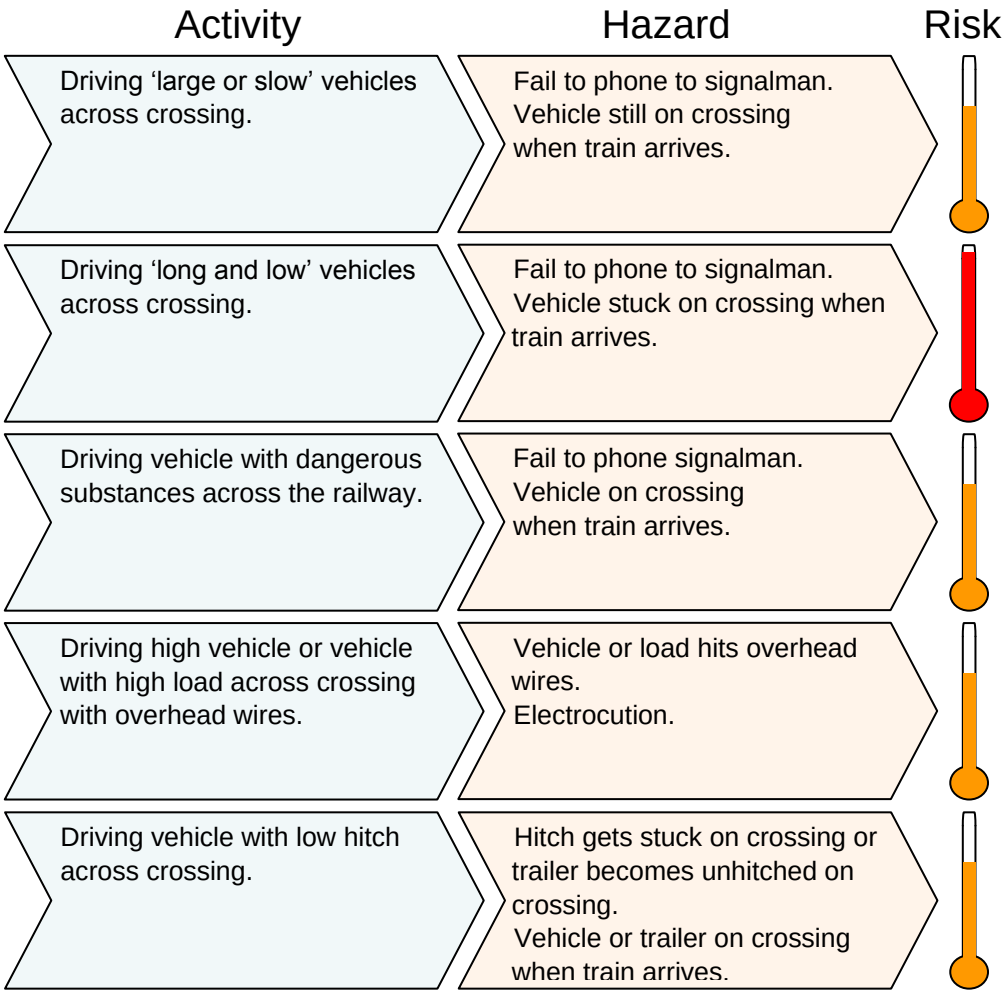


The Iarnród Éireann booklet: *The SAFE use of Unattended Railway Level Crossings* (3) gives further advice on such activities. If you need to carry out such an activity, you need to make arrangements with the Iarnród Éireann Divisional Engineer (see *Section 6* for contact details) to have protection arrangements provided. You should give as much advance notice as practicable. No movements should take place until these arrangements are agreed and in place.

(2) Reference [K]: Iarnród Éireann booklet : The SAFE use of Unattended Railway Level Crossings.
(3) Reference [K]: Iarnród Éireann booklet : The SAFE use of Unattended Railway Level Crossings.

Driving an Abnormal Vehicle or Load across a Crossing

The particular activities and hazards for a driver with an abnormal vehicle or load using a level crossing are summarised below.



In the context of crossing a railway level crossing, a vehicle or load is described as abnormal if it is any of the following:

- *Large* - more than 9m long or more than 2.9m wide
- *High* – more than 5m high
- *Heavy* - greater than 18 tonne
- *Slow* - less than or equal to 16 kph
- Low to the ground or has a particularly long wheelbase
- Carrying dangerous substances.

Drivers of abnormal vehicles or loads should be familiar with the Iarnród Éireann booklet: *The SAFE use of Unattended Railway Level Crossings* (4).

You should always ring ahead before crossing the railway at any type of crossing if the vehicle is *large*, *slow* or low to the ground or has a particularly long wheelbase. A slow moving or long load may take more than the allowed time to get across the crossing (for a crossing with lights and bells this may be as little as 24 seconds) from the initiation of the lights and the arrival of the train. A yellow telephone is normally provided at protected crossings. At unprotected crossings, the number of the controlling signalman is at the bottom of the "Keep these gates shut" sign.

Drivers of high vehicles or vehicles with high loads should be aware that the maximum safe headroom for a crossing with overhead railway wires is 5m.

Drivers of vehicles containing dangerous goods should ring the controlling signalman before crossing an unprotected crossing.

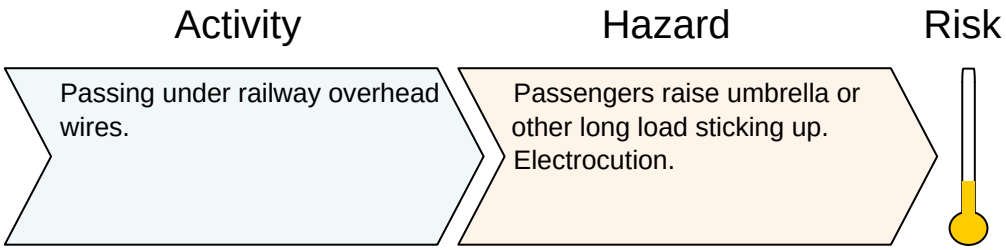
Reliance should not be placed on Gardaí personnel escorting the loads. Their role is to warn other motorists and to help the passage of the load past junctions. It is the load carrier's responsibility to ensure that it is safe to cross at each level crossing. Particular care should be taken at crossings (such as half barrier or lights and bells crossings) where there is no railway signalling protection to warn the train to stop.

The load carrier should be aware of the dimensions and weight of load and should drive the intended route in advance to check for height, weight and width restrictions. Further guidance on bridges is given in *Section 4*.

(4) Reference [K]: Iarnród Éireann booklet : The SAFE use of Unattended Railway Level Crossings.

Driving an Open Top Double Decker Bus across a Crossing

The particular activities and hazards for driving an open top double decker bus across a crossing are summarised below.



Where open top double decker buses operate under overhead railway wires from either the Luas or the mainline railway, there is the potential for passengers to come into contact with live wires, particularly if umbrellas are raised or passengers have long loads or packages that might reach these overhead wires. Open top bus operators should warn passengers of the potential dangers if they are likely to affect the route operated.

3 CROSSING THE LUAS

Motorists should:

- Not '*amber gamble*' – always stop at a red light.
- Look both ways before crossing the tramway.
- Make sure you can go without stopping on the tramway.
- Never drive along tram lanes.
- Never obstruct trams.
- Watch out for trams at junctions.
- Keep junction boxes fully clear.
- Never park in the path swept out by the tram while it moves along (including overhang on corners).
- Be aware of the height of their vehicle and keep clear of overhead electric lines.

Pedestrians should additionally:

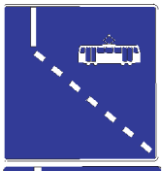
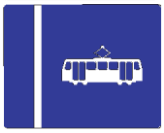
- Cross only where you see the '*Look Both Ways'* sign.
- Stand well back from the platform edge.
- Wait for the tram to leave the stop before crossing the tracks.
- Listen for horn and warning bell
- Avoid distractions such as headsets and mobile phones when crossing.
- Never walk along tramways.
- Be aware that tram tracks are slippery in wet and icy weather.

Cyclists should:

- Watch out for the rail groove and not let cycle wheels get caught in it.
- Cross the tracks at 90 degrees and use hand signals.
- Be aware that tram tracks may be slippery.
- Listen for horn and warning bell.
- Avoid distractions such as headsets and mobile phones when crossing.
- Never ride on '*tram only*' streets or tram lanes.
- Use cycle lanes where provided.

Road users should obey all tram, road and safety signs and the rules of the road. Important Luas signs and their meanings are shown in *Table 1.*

Table 1 Important Luas Signs

	No pedestrian access
	Tramway crossing point (pedestrians)
	Tramway crossing ahead (road traffic)
	Tram lane starts
	Tram lane
	Cyclists beware of tram tracks

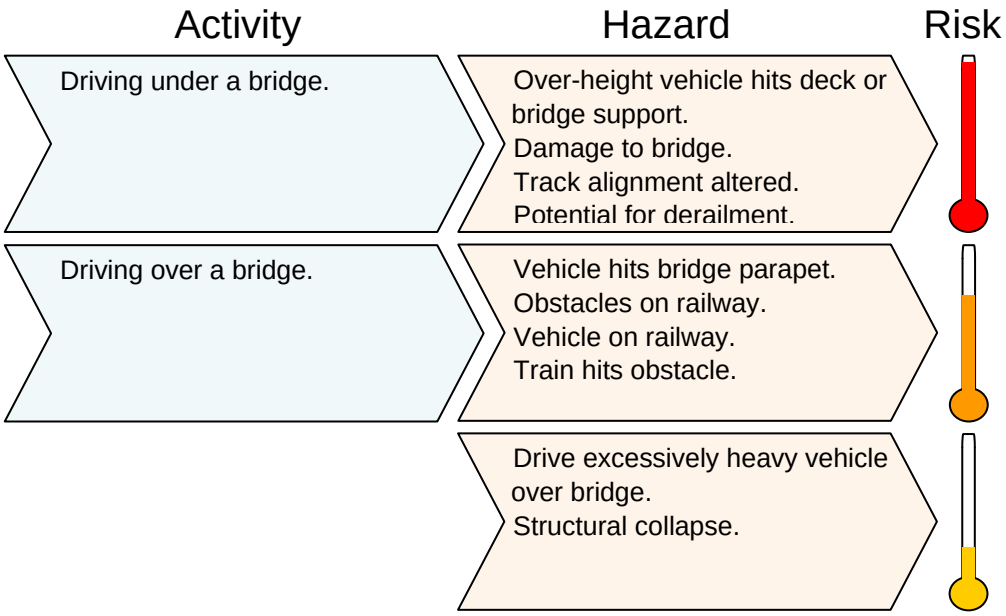
Further information about Luas safety is described on the Luas website - www.luas.ie -under '*Luas Safety Animation*' and '*Luas Safety Leaflet*.

A typical Luas crossing is shown in *Figure 10*.

Figure 10 Road Intersection with Tramway Crossing

4 CROSSING BY BRIDGE

The main activities and hazards for crossing a railway using a bridge are summarised below.



Driving under or over a Bridge

Drivers of high vehicles should know the height of their vehicle and drive under railway bridges with caution. For bridges with a height restriction, there is a requirement for regulatory signage on the bridge and a warning sign on approach. It is an offence punishable by fine and/or imprisonment to drive a vehicle of greater height under such bridges (5). You should check the bridge heights on your route. Clearances at arch bridges are available only at a restricted width as indicated on bridge by '*Goal Posts*'.

Iarnród Éireann maintains a list of bridges with restrictions. For details of bridges with height restrictions a map is available on application to the following email address bridgemaps@irishrail.ie or alternatively information is available through IÉ's website www.irishrail.ie. An example of a height restricted bridge is shown in *Figure 11*.

(5) Ref [A]: Railway Safety Act 2005.

Figure 11 Height Restriction Signage on Bridge under Railway

Drivers of wide/long vehicles or loads should take particular care at narrow bridges. It should be noted that some bridges have effective width restrictions where the approach road turns sharply to cross the bridge (S-bends). Drivers should take particular care with these crossings to ensure that loads are adequately secured and appropriately sized.

Where a bridge has a weight restriction, there is a requirement for regulatory signs to be present. Up-to-date lists of height- or weight-restricted bridges are available from Iarnród Éireann's Principal Engineer Track and Structures (see *Section 6* for contact details). Width restrictions and effective width restrictions due to road curvature should be determined by driving the route in advance.

Action to Take if you Hit a Bridge

When a vehicle hits any part of a bridge, the Central Traffic Control should be contacted as follows :

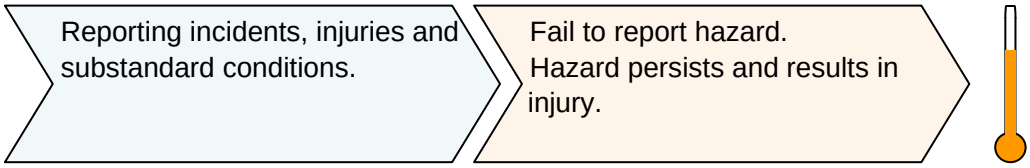
1) Ring central traffic control (see *Section 6* for contact details) to contact the signalman as follows:
2) Identify yourself, your location and your status (e.g. road user user etc.)

3) State "This is an emergency call"
4) Clearly state:
    - The restriction number or bridge number and be clear which you are reporting
    - The railway line and road (if known)
    - The amount of damage done to the bridge
    - Required actions e.g. stop trains
5) Give your name and contact details in case further information is required.
6) Follow the directions of the signalman.

It should be noted that it is an offence to fail to report an incident of vehicle impact with railway structures (6).

(6) Ref [A]: Railway Safety Act 2005.

5 REPORTING INCIDENTS, INJURIES AND SUBSTANDARD CONDITIONS



The railway company should be taking all reasonable steps to ensure the safety of the passengers, staff and the general public. If you are injured or you see something unsafe, you should report it to a member of staff. The railway companies record all incidents and accidents which are reviewed periodically to allow them to learn and continuously improve the level of safety.

Similarly, the railway companies have an obligation to provide a railway that is accessible to all (7). Guidelines exist that describe what is meant by "accessibility" for a transport operator in Ireland (8) including what information is made available, accessibility requirements for infrastructure, requirements for clear signage (9) (10), the need for disability awareness training and coping in an emergency so that the needs of the public are met.

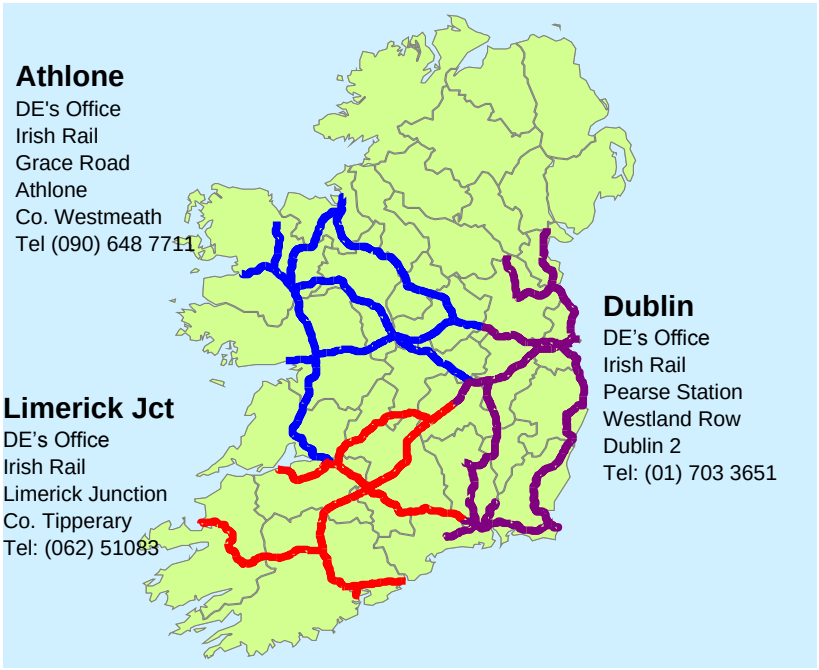
If you feel that the railway company is not taking adequate action to address your concerns, you can report the matter to the Information Officer at the Railway Safety Commission (see *Section 6* for contact details). The RSC would also like to be told if you have suffered an injury associated with the railway requiring you to be detained in hospital for more than 24 hours.

(7) Ref [N]: Disability Act 2005 - Part 3.
(8) Ref [O]: Recommended Accessibility Guidelines for Public Transport Operator in Ireland.
(9) Ref [S]: BS8501:2002, Graphical symbols and signs. Public information symbols.
(10) Ref [T]: BS8502:2003, Graphical symbols and signs. Creation and design of public information symbols. Requirements

6 KEY CONTACT POINTS

General
Emergency services: 999 on any public or fixed land line or 112 on a mobile telephone.
Railway Safety Commission
Information Officer Railway Safety Commission Trident House Blackrock County Dublin Ireland info@rsc.ie www.rsc.ie Tel : (01) 206 8110 Fax : (01) 206 8115
Iarnród Éireann
Principal Engineer Track and Structures Iarnród Éireann Track and Signals HQ Inchicore Dublin 8 Tel: (01) 703 4207
Iarnród Éireann Central Traffic Control (24-hour Emergency Number for reporting an immediate danger) (01) 855 5454
Iarnród Éireann Electrical Control - DART area (Emergency Number for reporting an immediate danger) (01) 878 7035

Divisional Engineer (DE) as appropriate:



Accessibility Officer:
http://www.iarnrodeireann.ie/about_us/contact_disabled_access.asp
Email: access@irishrail.ie
(01) 703 2634

Luas

Luas – Central Traffic Control (24-hour Emergency Number for reporting an immediate danger)
(01) 467 3040

Communications Manager
Veolia Transport Ireland Limited
Luas Depot
Red Cow Roundabout
Clondalkin
Dublin 22
Email: Luascustomercare@veolia-transport.ie
Tel: (01) 461 49 10
Freefone: 1800 300 604
Fax: (01) 461 4992

Heritage or Bord na Móna

Bord Na Móna
http://www.bnm.ie/

Fintown Railway
http:// www.antraen.com

Irish Steam Preservation Society Limited http://www.irishsteam.ie/
Lartigue Monorailway http://homepage.eircom.net/~lartiguemonorail/Page%202.htm
Railway Preservation Society of Ireland http://www.rpsi-online.org/
Tralee & Dingle Railway http://www.tdlr.org.uk/
Waterford & Suir Valley Railway http://www.wsvrailway.ie/
West Clare Railway http://www.westclarerailway.com/

7 GLOSSARY OF TERMS

Catch Points	A pair of sprung trailing points usually located in gradients steeper than 1 in 260. Their purpose is to derail any train running backwards without authority or out of control.
Central Traffic Control (CTC)	Main control room from which the passage of trains is controlled.
Clearance	Gap between the 'swept path' of the train and the railway infrastructure.
Connex	Former name of Veolia Transport, the operator of the Luas.
Culvert	Small bridge or pipe carrying a stream under a railway or road.
DART	Dublin Area Rapid Transit. An area of electrified commuter mainline railway running from Greystones in the South to Howth and Malahide in the North.
Electromagnetic interference (EMI)	This is a type of electromagnetic radiation, produced from the operation of a primary equipment item. It is normally associated with electrical circuits that carry rapidly changing signals as a by-product of their normal operation. It is also sometimes called Radio Frequency Interference (RFI).
Height restricted bridge	Bridges are considered to have a height restriction if they do not provide a vertical clearance of 5.03m (16’6”) for a 40’ vehicle.
Heritage railway	A railway which is run as a tourist attraction and seeks to re-create railway scenes of the past.
Iarnród Éireann	The infrastructure provider and train operator of the mainline railway.
Industrial Railway	Private railway used exclusively to serve a particular industry – the largest industrial railway in Ireland belongs to Bord na Móna.
Luas	Tramway in Dublin.
Mainline railway	Railway operated by Iarnród Éireann. Excludes tramways such as the Luas.
Major Accident Prevention Document (MAPP)	Document required under major hazard legislation made under the Seveso II Directive.
Overhead line equipment (OHLE)	Equipment suspended over the railway for supplying electricity to electric trains. Sometimes called the overhead conductor system (OCS).

Overhead conductor system (OCS)	Equipment suspended over the railway for supplying power to electric trains. Sometimes also called overhead line equipment (OHLE).
Over-line bridge	A bridge where the railway runs below another route (e.g. a road).
Parapet	Bridge side wall.
Railway	Means of transport where vehicles run on iron rails. In this booklet, the term includes both the mainline railway and tramways.
Railway airspace	The airspace above railway land.
Railway company	A company that is responsible for tracks and other railway infrastructure, or which operates trains/trams (or both).
Railway infrastructure	Fixed equipment and structures on and around the railway including track, bridges, signals, stations, platforms, buildings and level crossings.
Railway Safety Commission (RSC)	The body responsible for regulating/enforcing railway safety and investigating/reporting on railway incidents.
Railway Procurement Agency (RPA)	The company responsible for the design and build of the Luas.
Running Rail	The rail on which a train's wheels sit.
Safety Report	Document required under major hazards legislation for the sites with large quantities of major hazard materials.
Signal	Similar to a road traffic light. Used to control the safe separation of trains.
Signal sighting	Ability of the train driver to see the signal at the correct distance.
Swept path	The volume of space swept through by a train in motion. It takes account of overhang on curves, tilting, etc.
Track formation	The material underneath track and ballast that provides support.
Track destabilisation	Loss of track support.
Third Party	Anyone not working for the railway company or travelling on the railways as a passenger.
Under-line bridge	A bridge where the railway runs over another route (e.g. a road or a river).
Veolia Transport	The company responsible for operating the Luas.
Wayleave	A wayleave gives a right to use the land of another for a special purpose. Unlike a lease, a wayleave does not give the holder a right of "possession" of the property, only a right of use
Wheelbase	The distance between the front and back wheels of a vehicle.

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