Private level crossings in Ireland

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Irish network

• Passenger railway with a little rail freight
  11k train-km per line-km (67% of EU average)
• Mostly rural, single track, fenced railway
  1.3 track-km per line-km
• 1011 level crossings in use
  0.61 level crossings per line-km
Passive gated road level crossing
Topics discussed

• Safety performance
• Safety investment
• Collision risk
• Dealing with risk
Safety Performance

• Level crossing safety performance:
  – EU fatality rates
  – National accidents
EU level crossing fatality rates

Currently 0.04 deaths per billion train-km
IE accidents at passive LCs & with herds

Strike incidents at user-worked LCs, and major animal strikes

- Equiv. Fatalities Person on foot
- Equiv. Fatalities Vehicle User
- Equiv. Fatalities Passenger
- Train collisions with vehicles
- Group of animals struck

No of incidents

Period

Safety Investment

• Railway Safety Programme
  • Reduction of passive LCs
  • Upgrade of active LCs
• LC asset profile changes 1998-2013
  • LCs in use
  • Changing risk profile
Investment programme 1999-2013

• Railway safety programme –
  o Bring network to acceptable safety standard
  o €1.6bn invested (€210 million for LCs)
  o 80% less LCs on arterial routes
  o 45% less passive LCs on network

• LC de-manning programme –
  o 61% manned LCs upgraded to full barrier
  o Central supervision of full barrier LCs
  o Open and AHB LCs with flashing lights eliminated
Pedestrian LCs are excluded from these figures.

LCs in use on IE current network

LCs in use end 1998 (total 1589)
- 83% private

LCs in use end 2013 (total 963)
- 75% private

Legend:
- Private Field UW
- Private road UW
- Public road UW
- Automatic
- Unsignalled manual gates
- Signalled manual gates
- Full barrier
65% of active LCs upgraded

45% reduction of passive LCs

Changing risk profile (1)
65% of active LCs upgraded

45% reduction of passive LCs

Train collision with obstacle per 1000 LCs per annum (RSC records)

Note: Train collision rate for 'full barrier' LCs is notional
Collision risk at passive LC

- Collision risk depends on
  - Train speed, visibility & audibility
  - Frequency of use
  - Degree of protection
  - Type of user
Train speed and visibility

• Maximum allowable train speed
• User must always stop and check for trains
• User must see train
• Train headlights must be on at all times
• User needs time to cross safely
• Any moving train can kill
Frequency of use

• Farm crossings
  – passive gates
  – very light use
  – seasonal use
• Private roads
  – passive gates
  – light use

• If regular use, users tend to leave gates open
Degree of protection

Level crossing types, in rising order of protection:

- **Passive** - user must look out for trains
- **Active:**
  - Manual warning
  - Manual barrier
  - Automatic warning or half-barrier
    automatic warning is used at one private crossing
  - Manual barrier + automatic rail signals
  - Full barrier + interlocked rail stop signals
- **Grade separation**
Type of use

‘Private road crossings’ may give public access; ‘Farm field’ crossings are usually private.

Pros and cons:

– Landlord’s Health & Safety responsibilities - workplace, system of work, access, etc.
– Restricted use – easier to identify users
– Hard to foster good relations & behaviour
– ‘Familiarity’ breeds bad habits
– Naive users (e.g., utility workers, contractors, visitors)
– Special arrangements required for awkward vehicles
Dealing with the risk

• Assess
• Treat
• Transfer
• Terminate
Assess

- Risk factors
- Tolerability limits
- Risk model
- Prioritisation
Treat

• Minimum viewing time
• Surface, layout and signs
• Corrals for herds
• Educate and monitor users

Pros and cons:

– Low cost approach
– Speed restrictions
– High maintenance (views, policing, liaison)
Transfer

- Upgrade to active mode

Pros and cons:
- Improved user warning or protection, but
- Warnings can be ignored
- Protection is expensive
Terminate

• Close, or grade separate
• Link adjacent LCs to one crossing point

Pros and cons:

– Better railway asset (increased train speeds)
– Low maintenance
– Less staffing and staff stress
– Safety benefit to the users
– Grade separation is expensive
Grade separated closure of passive road level crossing