

# 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

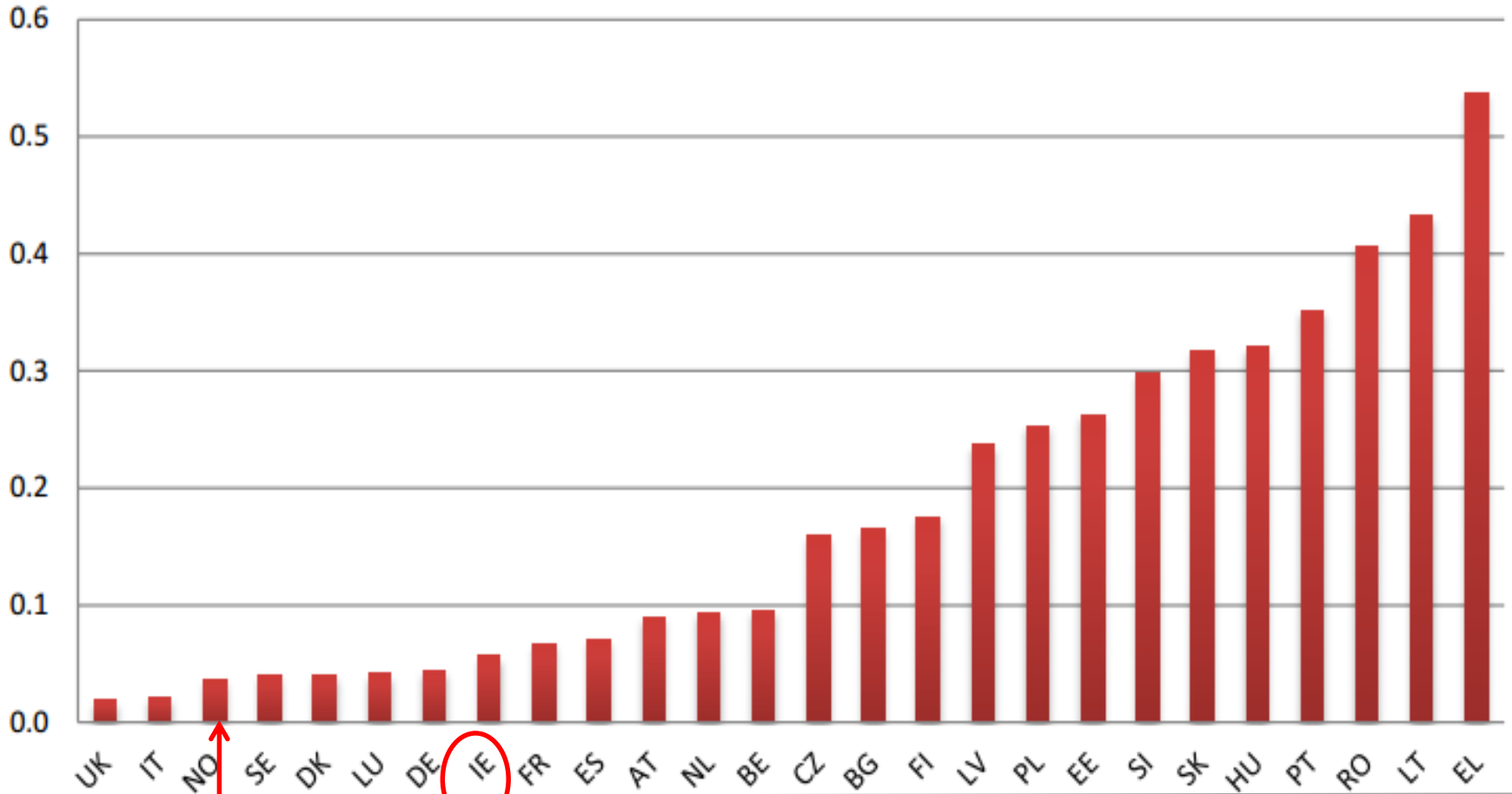
- Safety performance
- Safety investment
- Collision risk
- Dealing with risk

# Safety Performance

- Level crossing safety performance:
  - EU fatality rates
  - National accidents

# EU level crossing fatality rates

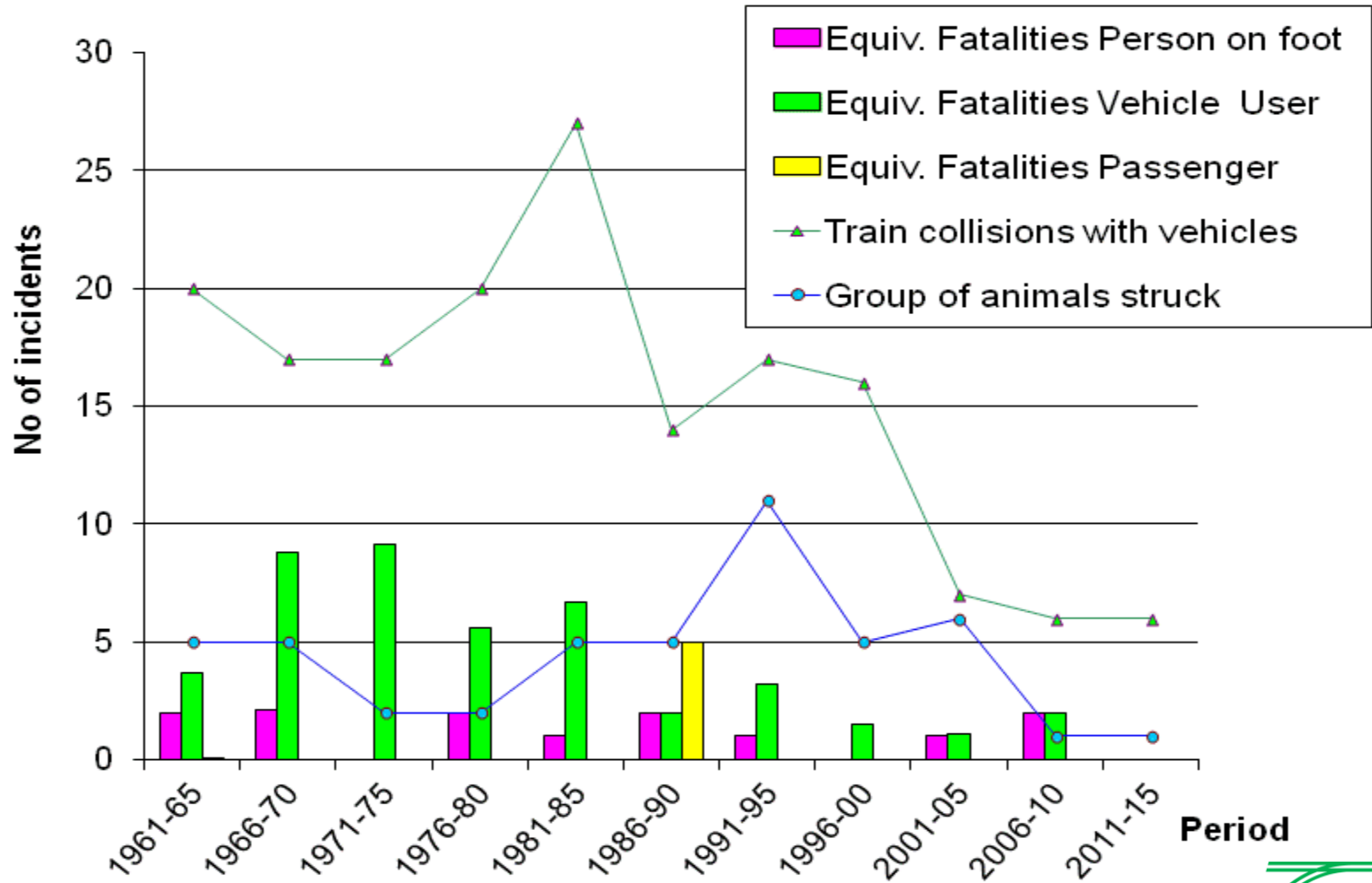
Fatality risk at level crossings (fatalities per million train-km) - 2009-2011



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



# 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

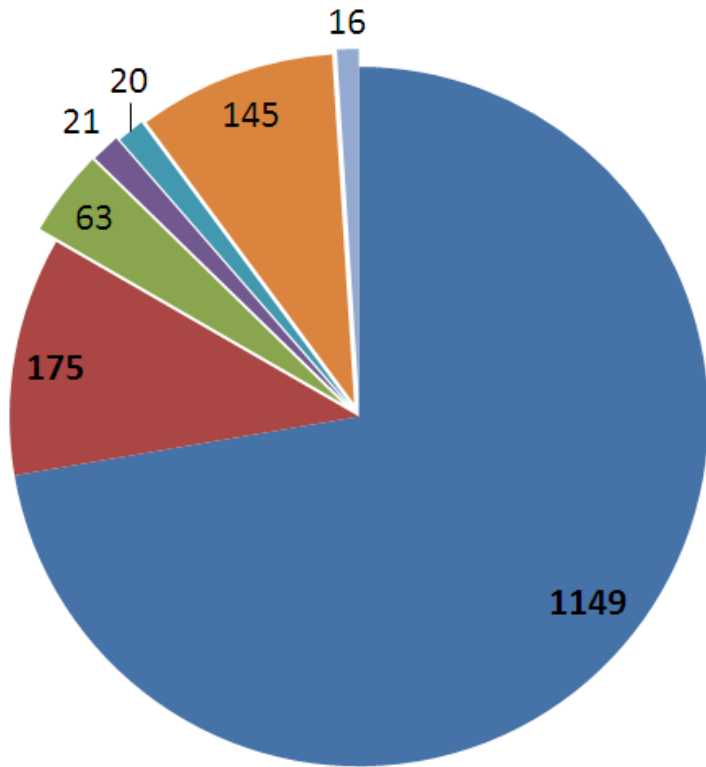


# Investment programme 1999-2013

- Railway safety programme –
  - Bring network to acceptable safety standard
  - €1.6bn invested (€210 million for LCs)
  - 80% less LCs on arterial routes
  - 45% less passive LCs on network
- LC de-manning programme –
  - 61% manned LCs upgraded to full barrier
  - Central supervision of full barrier LCs
  - Open and AHB LCs with flashing lights eliminated

# LCs in use on IE current network

Pedestrian LCs are excluded from these figures

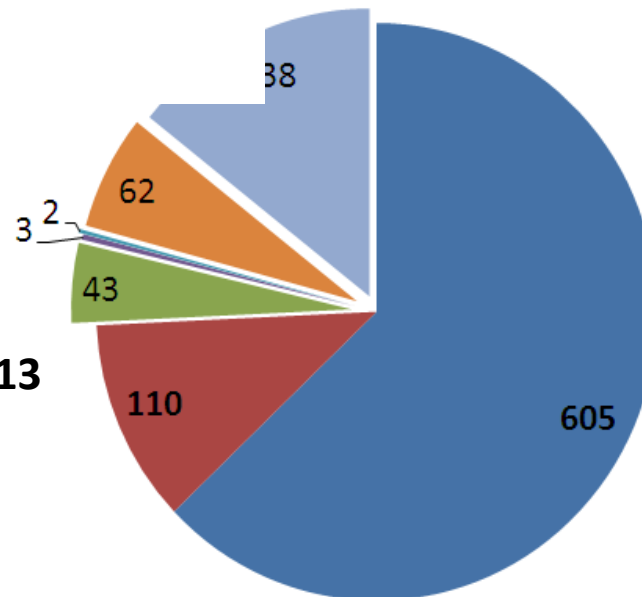


**LCs in use end 1998  
(total 1589)**

**83% private**

**LCs in use end 2013  
(total 963)**

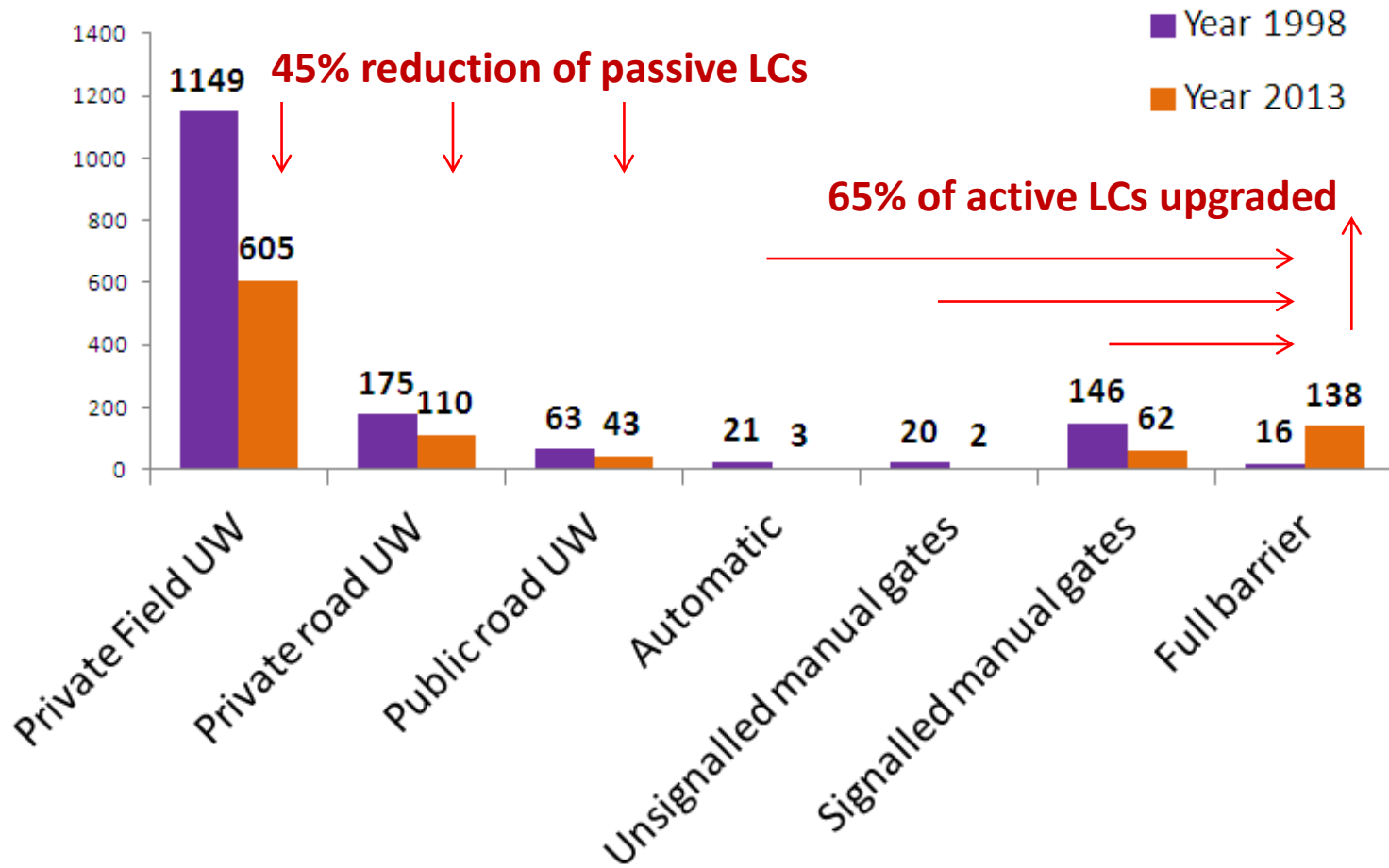
**75% private**



- Private Field UW
- Private road UW
- Public road UW
- Automatic
- Unsignalled manual gates
- Signalled manual gates
- Full barrier

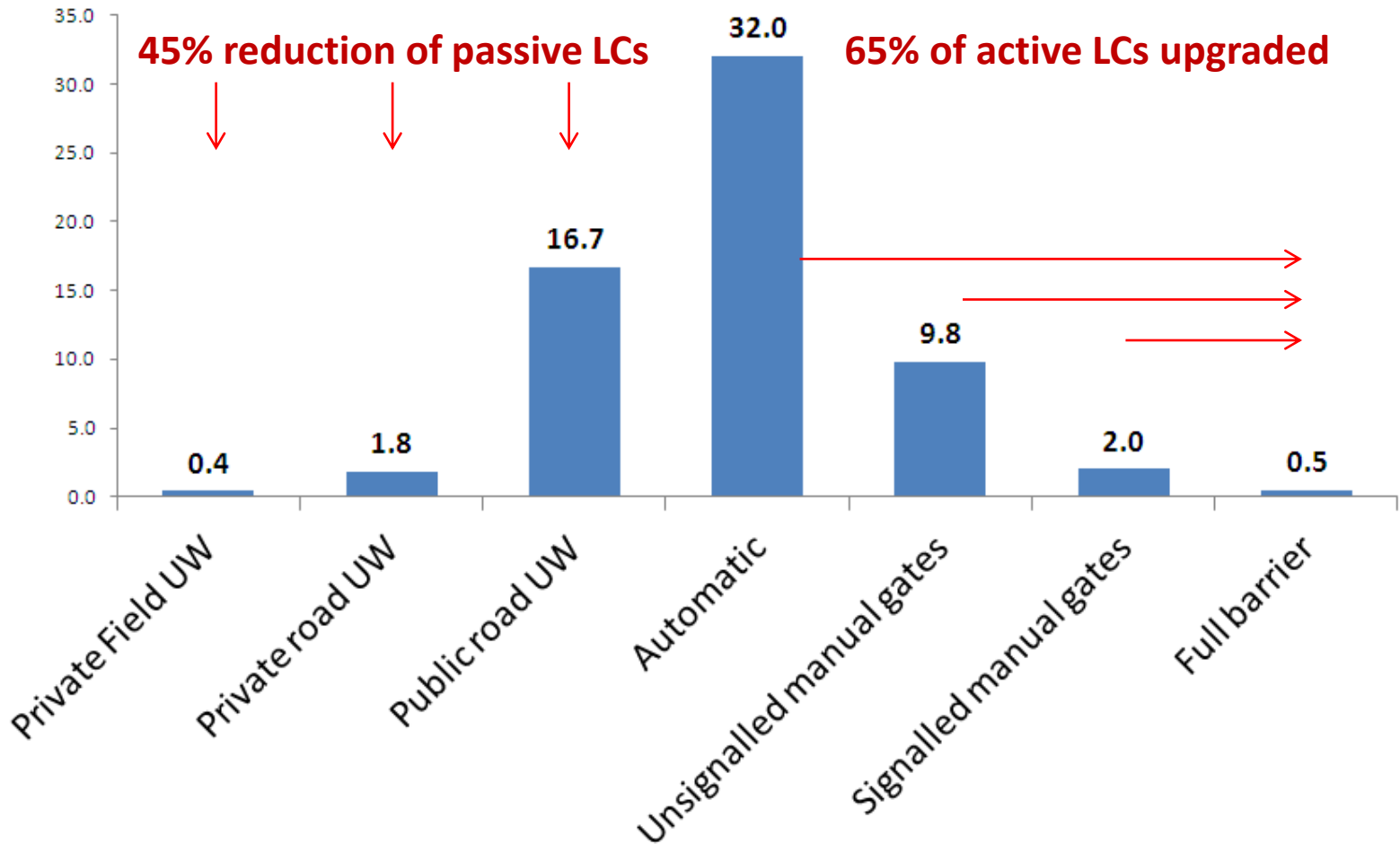
# Changing risk profile (1)

IE current network: LCs in use end 1998 and end 2013



# Changing risk profile (2)

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