

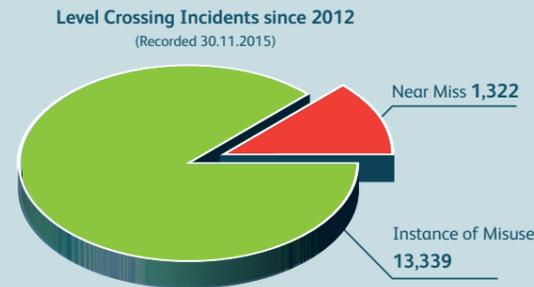
V2 Preventing an Incident or Near Miss at a Level Crossing Due to User Behaviours

What is the situation?

Collisions at level crossings are the largest single train accident risk. Between April 2006 and March 2016, eighty-six accidental fatalities occurred at level crossings. Although the number of occurrences has decreased over this period, we haven't been able to eradicate the problem. Four accidental fatalities have occurred since April 2016.

It is part of our long-term strategy to reduce the likelihood of such incidents. Our primary objective is to close as many level crossings as possible. Where a closure isn't achievable, we will drive down risk through the introduction of advanced technology. Our research studies, including the Willingness to Wait assessment, are helping us to better understand user behaviour but there is more work to do.

The challenge of communicating the risks of level crossings to the public remains. Empowering users to act safely when crossing the railway while also understanding how we can improve our assets, and reduce risk, is our key focus at level crossings.



From 2015 to 2016, Network Rail incurred costs of £12.3m from all types of events at level crossings.

Analysis of causes

How we cross

Using a mode of transport:

- Cars.
- Vans and lorries.
- Bicycles and motor bikes.
- Farm vehicles.
- Buses.
- Mobility scooter.
- Horse.

Categories of people walking onto the crossing:

- Adults.
- Children.
- Young adults.
- Dog walkers.
- Farm workers.
- People with mobility issues (or disability).

1 Perception of Risk

- A. Familiarity with Crossing
→ A2: Effects of irregular or unmetabled service
- B. Prior education and experience
- C. Failure to hear or sound whistle
- D. Gates left open

2 Distraction During Traverse

- A. Using technology whilst walking
- B. Pets (e.g. Dog running onto track)
- C. Sat Nav / Hands-free systems

3 Communication

- A. Obscured and unclear signage
- B. Obscured crossing (vegetation)
- C. Poor quality communication with signaller
- D. Difficulty hearing train horn
- E. Language barriers
- F. Current methods assume prior knowledge

4 External Influences incl. Design

- A. Park cars/backed up traffic/overtaking
- B. Poor road adhesion
- C. Weather conditions (fog / sun glare)
- D. User running late / high workload
- E. Level crossing faults
- F. Peer-pressure / bravado
- G. Speed of traverse
- H. Getting stuck on crossing / being injured on crossing

Priority problems

Specific priority problems

- Improving the protection provided at level crossings through technological innovation.
- Enhancing communications with both unfamiliar and existing users of level crossings to educate the public and raise awareness of risk.

Related goals

- Understand how we can best inform users of the risks posed by misusing a level crossing.
- Overcome variable train approach speeds to deliver a consistent warning time to crossing users.
- Zero harm at crossings, including near miss trauma.
- By 2025 telephones will not be the primary means of protection at any of our user-worked crossings.
- By 2025 all whistle boards will either have been eliminated or supported by automatic user-based warnings.

Benefits

- Reduction in fatalities and incidents of all nature at level crossings.

Specific research needs

To address these challenges it is expected that R&D actions need to address the following aspects:

Understanding the Level Crossing User

A deeper understanding of user behaviour at crossings is needed. What makes users do what they do? What factors contribute to their decision-making process? How can we inform users of the unique risks related to the railway environment at a level crossing? What do users consider an effective warning system?

Warning period and train arrival consistency

What does a consistent warning period and train arrival time have on the user's 'willingness to wait'? How long should a consistent warning time be? What technologies are currently available to predict train arrival time and provide a consistent warning period? Can a solution be developed that will determine the exact train location and level crossing arrival time?

Emerging social behaviours and distractions e.g satnav, smart phones, headphones and other forms of mobile technology

Assessment and impact of emerging social behaviours in terms of risks posed and mitigations needed. How can we 'future proof' level crossings so that they continue to protect users effectively?

Technologies to address behaviours

What type of technology is most suitable to address the issues raised above?