

TRANSPORT AND WORKS ACT 1992

**TRANSPORT AND WORKS (INQUIRIES
PROCEDURE) RULES 2004**

**THE NETWORK RAIL
(ESSEX AND OTHERS LEVEL CROSSING
REDUCTION)
ORDER**

APPENDICES

TO PROOF OF EVIDENCE OF MARK BRUNNEN

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INDEX

	DOCUMENT
TAB 1	Network Rail Level Crossing Policy
TAB 2	Fatalities and Serious Incidents at Level Crossings
TAB 3	Glossary of Terms

TAB 1

Level crossing policy

Our policy for level crossings involves:

Reducing the number and types of level crossings

- We shall set and monitor annual targets for level crossing closures.
- We will rationalise the numbers and types of level crossings.
- If closure is not possible, we will seek to reduce risk and enhance safety - where reasonably practicable - at every opportunity.
- Closure will always be the priority consideration for any project or scheme that includes a level crossing or crossings within the scope.
- Only in exceptional circumstances shall we permit new crossings to be introduced onto the network.

Reducing level crossing risk

- We will consider all business risks when making level crossing enhancement and investment decisions.
- We will set and monitor annual targets for risk reduction.
- We will seek to modernise existing types of level crossings by designing out risk and introducing new technologies.
- Risk management practices will be revised to provide assurance that all risks identified are considered and actions taken are recorded.
- We will not seek to introduce any new Automatic Half Barrier crossings onto the network, where to do so would increase risk. Where a further technological improvement to reduce risk and improve safety is not available, we will rationalise this type of crossing at the point of renewal, or sooner, based on risk, opportunity and business benefit.
- We will continue to request and participate in research to reduce level crossing risk.
- We will continue to investigate, trial, and implement new technology, processes and techniques to improve safety.
- We will use tools such as the All Level Crossing Risk Model to inform and support us in our decision making.
- We will implement lessons learned from accidents and incidents.
- We will seek to present a consistent experience to the crossing user.
- We will prioritise those crossings with the greatest collective risk.
- The opportunity to improve safety and reduce or eliminate risk at level crossings should be included in all initial project remits, plans and development, irrespective of the projects predicted impact on level crossing risk.
- Our level crossing staff will be qualified risk practitioners with regular training and competence testing.

Ensuring level crossings are fit for purpose

- Level crossings will be well maintained in accordance with technical specifications.

Level crossing policy

- Level crossings will be risk assessed and inspected at specified regular intervals based on risk and usage.
- We will seek to reduce the number of multi disciplinary interfaces and create a system approach to management of the asset.
- If closure is not possible, life expired level crossings will be renewed incorporating the latest design and technology to reduce risk.
- At the point of renewal, or sooner, all Automatic Open Crossings locally monitored will be closed or replaced by a modern barrier type crossing.
- We will seek to introduce new technologies and utilise existing technology in alternative configurations to improve safety and create efficiencies based on risk, business benefit, whole life costs and asset condition.
- We will seek to increase automation in the operation of level crossings in order to enhance safety and reduce operating costs, providing high quality, consistent, information and guidance directly to users.
- Targeted renewal of component parts will be the preferred option until such time as the full renewal is required.
- Our technology strategy for level crossings will seek to introduce greater competition for lower cost commercially available products and expedite delivery timescales, approvals processes and standards development.
- We will seek to reduce costs and minimise; power, cables, lineside equipment and intrusive manual lineside maintenance, with the minimal interface with the existing signalling system.
- Our deliverability strategy will seek to standardise design and increase capabilities and competencies of internal and external contractors to install and test equipment.
- Technology solutions will focus on providing information to the crossing user directly.

Working with users and stakeholders

- We will educate users in the safe use of level crossings.
- We shall seek to involve users and stakeholders in risk assessments and developing controls to improve safety.
- We will regularly involve and inform our stakeholders of new technologies and developments in the management of level crossings.
- We will form partnerships and improve relationships with internal and external stakeholders to improve safety at level crossings.
- We will regularly communicate with our Authorised Users.
- We will work with corporate users to improve understanding and awareness of the safe use of level crossings.

Supporting enforcement initiatives

- We will help the BTP to develop strong Policing Plans and targets regarding level crossing risk.
- We will offer risk advice and intelligence to the BTP to help them to efficiently target level crossing misuse.

Level crossing policy

- We will support joint initiatives with BTP and other stakeholders to enforce level crossing and traffic laws and regulations.
- We will work with external agencies to maximise penalties and to introduce new sanctions for dangerous and deliberate acts of misuse at crossings.

TAB 2

Fatalities and Serious Incidents at Level Crossings 2005-2017

- a) The Rail Accident Investigation Branch (RAIB) has investigated 17 incidents (18 fatalities) involving pedestrians at level crossings on Britain's main line railways since it became operational in October 2005:
1. *A pedestrian was fatally injured at Barratt's Lane No.1 footpath crossing near Attenborough (LNE/EM) on 21st November 2005. It was concluded reduced visibility from the fog and the impaired hearing of the pedestrian were the main cause. (RAIB report 13/2006)*
 2. *Two teenage girls were struck and fatally injured on Elsenham station crossing, (Anglia) on 3rd December 2005. The girls waited for a train to pass at the station level crossing, then stepped out into the path of a fast moving train travelling in the opposite direction on the other track, and which had been hidden from their view by the first train. (RAIB report 23/2006)*
 3. *A cyclist was struck and seriously injured on Scate Moor bridleway crossing between York and Harrogate (LNE) on 8th January 2006. (RAIB report 06/2006)*
 4. *A pedestrian was struck and fatally injured on West Lodge user worked crossing, Haltwhistle (LNE), on 22nd January 2008. He was making a delivery to the adjacent property and had already crossed over the railway twice, before being hit by the train. (RAIB report 01/2009)*
 5. *A pedestrian was struck and fatally injured on Tackley Station crossing (Western) on 31st March 2008 when she stepped out into the path of an approaching train. The report stated that restricted sighting distances at the level crossing resulted in the deceased remaining unaware of the approaching train until after she had committed herself to using the crossing, possibly being unable to hear its approach. (RAIB report 09/2009)*
 6. *A pedestrian was struck and fatally injured on Moor Lane footpath crossing, Staines (Wessex), on 16th April 2008. The report found that the gentleman failed to stop, look and listen before stepping out onto the crossing and then fell to the ground on the crossing deck. He was unable to avoid being struck by the approaching train. (RAIB report 27/2008)*
 7. *Two pedestrians were struck and fatally injured on Bayles and Wylies footpath crossing, (LNE/EM) on 22nd November 2008. They remained unaware of the oncoming train as they crossed in front of it, until it was too late. (RAIB report 32/2009)*

8. *A local resident and frequent level crossing user was struck and fatally injured whilst walking her dogs at Fairfield footpath crossing, Bedwyn, (Western) on 6th May 2009. (RAIB report 08/2008)*
9. *A pedestrian was fatally injured on Gipsy Lane footpath crossing, (Anglia), on 24th August 2011. On seeing the pedestrian on the crossing the train driver sounded his horn but the pedestrian continued to cross and was struck. (RAIB report 15/2012)*
10. *A pedestrian was fatally injured on Mexico footpath crossing (Western) on 3rd October 2011. Approaching the level crossing round a curve, the train driver observed a person standing to the side of the line and sounded the warning horn. However, the pedestrian attempted to cross and was struck. (RAIB report 10/2012)*
11. *A pedestrian was fatally injured on Johnson's footpath crossing (LNE/EM) on 28th January 2012 when he stepped out onto the crossing into the path of the approaching train, despite warnings provided by a red miniature stop light and an audible alarm. (RAIB report 27/2012)*
12. *A fatal accident occurred at Kings Mill No.1 bridleway crossing (LNE/EM) on 2nd May 2012. A cyclist was struck by a train travelling at 56mph. The cyclist had not stopped or dismounted before crossing and was both listening to music through earphones and wearing a hood. He missed the train's warning horn and did not hear the warning shouts from other pedestrians. (RAIB Report 01/2013)*
13. *A pedestrian was struck and fatally injured at Bayles and Wylies footpath crossing (LNE/EM) on 28th November 2012. Crossing behind friends, the teenage girl moved into the path of an approaching tram. She appeared to be unaware of its approach despite the horn being sounded continuously in the seconds before the collision. (RAIB report 32/2009)*
14. *A cyclist was struck and fatally injured by a passenger train travelling at 100mph over Motts Lane Bridleway level crossing, (Anglia), on 24th January 2013. It was dark at the time but the MSLs at the crossing were showing red and the audible warning was sounding. (RAIB report 01/2014)*
15. *A pedestrian was fatally injured on Barratt's Lane No.2 footpath crossing (LNE/EM) on 26th October 2013. Two trains approached the crossing at the same time – one travelling normally and the other at slow speed having been held at signals. It is believed that the pedestrian concentrated her attention on the slower moving train and did not notice the faster train approaching from the*

opposite direction. (RAIB report 18/2014)

16. *On 23rd February 2016, a man was struck at Grimston Lane footpath crossing, (Anglia) on the single line between Trimley and Thorpe Lane. The man appeared to see the train and acknowledge its warning horn, but stepped out to cross anyway. He was unable to reach a position of safety before the train arrived. (RAIB report 23/2016)*
 17. *An 83 year old man was fatally struck by a train as he tried to cross over Alice Holt public footpath level crossing (Wessex) on a mobility scooter. He was with his pet dog at the time, which was not on a lead. He may have initially thought that the non-stopping train would call at the adjacent station.*
- b) The RAIB has also investigated a further 13 serious incidents involving motor vehicles at level crossings since October 2005:
1. *On 03 November 2008 a fatal accident occurred at Wraysholme AOCL at Flookburgh (LNW) when a motorist did not comply with the red lights and drove into the path of a passenger train. It was never established why the motorist failed to stop. (RAIB report 26/2009)*
 2. *A single locomotive running along the Cambrian Coast line collided with a car at a User Worked crossing (No. 451) at Penrhyndeudraeth North Wales at 11.35 on 2 September 2009. The train hit the driver's side, fatally injuring the driver (and resident of the crossing cottage for 37 years) pushing the car 74m along the single (bi-directional) track. (RAIB Bulletin 07/2010)*
 3. *On 29 September a fatal accident occurred at Halkirk AOCL (Scotland) where 3 died following the collision of a car and train. The most likely cause was that the driver did not see or react to the flashing road lights due to poor eyesight. (RAIB report 16/2010)*
 4. *On 16th January 2010 at Moreton-on-Lugg full barrier crossing (Wales), a collision occurred between a passenger train and 2 cars when the signaller in the adjacent signal box raised the barriers in error. The signaller had been distracted by a telephone call and believed that the approaching train had already passed. (RAIB report 04/2011)*
 5. *On 17th August 2010 an articulated tanker drove onto Sewage Works UWC(T) (South East) into the path of an approaching passenger train, which caused the*

train to derail. The tanker driver did not use the telephone at the crossing to call for permission to cross. Several passengers on the train, the train driver and the conductor were injured, 5 seriously (but none fatally). (RAIB report 14/2011)

6. *On 25th September 2011 a collision between a passenger train and tractor at White House Farm UWC (Wales) occurred when the tractor moved onto the crossing into the path of an oncoming train. The tractor driver had phoned for permission to cross, and the signaller incorrectly authorised the move without seeking the driver's confirmation that the train had already passed. The tractor driver did not look prior to crossing as he considered the signaller's permission was sufficient guarantee that it was safe to do so. (RAIB report 06/2012)*
7. *A collision between a passenger train and a lorry with trailer occurred on 19th December at Llanboidy AHB crossing (Wales) after the lorry stopped on the crossing when the barriers lowered. It was determined that the lorry driver had failed to telephone the signaller for permission to cross, in compliance with the road signs. (RAIB report 20/2012)*
8. *On 4th December 2012 a collision occurred between a train and a car at Beech Hill AHB crossing (LNE) resulting in the fatal injury of a young child in the car. Although the barriers were down prior to the accident, the car driver did not see the red traffic lights and only noticed the barriers when very close to them due to the impact of sun glare. (RAIB report 17/2013)*
9. *On the 21st March 2013 a fatality occurred at Athelney AHB level crossing (Western) when a car drove around the barriers and into the path of an approaching train. The barriers were lowered for a longer period than usual before the arrival of the train due to earlier engineering works. It is thought that the driver may have believed the crossing had failed with the barriers in the closed position. He did not use the crossing telephone to contact the signaller and check. (RAIB report 04/2014)*
10. *On 14th July 2017 a non-fatal collision occurred between a passenger train and car on Jetty Avenue UWC + FP (Anglia). The car driver looked for approaching trains whilst opening the crossing gates. Once back in his vehicle, his sighting distances were reduced and he failed to detect that a train had appeared since opening the open gates. (RAIB report 28/2014)*
11. *On 16th July 2013 a collision at Buttington Hall UWC (Wales) occurred when a tractor and trailer was driven onto the crossing by a contractor without prior permission being sought from the signaller by telephone. The farmer had appointed an attendant at the crossing to phone and to operate the gates but*

Network Rail (Essex and Others Level Crossing Reduction) Order

their system of work was found to be inherently unsafe.

12. *A motorcyclist was struck and fatally injured by a train on Frampton level crossing, (Western), on 11th May 2014. The rider was crossing the railway on a trail bike, designed for off-road use. He was the last of a group of three riders who had reached the level crossing along an unsurfaced track leading from a minor road near the village of Sapperton. They were not authorised to use vehicles on the crossing. (RAIB report 05/2015)*
 13. *On 14th May 2015 a tractor was driven into the path of an approaching passenger train at Oakwood Farm UWC (MSL), (LNE/EM) after the illuminated warning lights at the crossing had changed from green to red whilst the driver opened the crossing gates. The driver failed to notice before moving off.*
- c) Additionally, not the subject of an RSSB investigation, the following 42 fatalities to pedestrians have been recorded since 2013 to date, including those still under investigation:

Date	Location	Route	LC Type	Description
15.01.13	Ketton (Rutland)	East Midlands	FP	A 79 year old man was killed on a pedestrian crossing when walking his dog
28.01.14	Cringelford (Norfolk)	Anglia	AHB	A pedestrian was killed when struck by a train on the Cringelford automatic half-barrier level crossing near Norwich.
24.03.14	Cattishall (Bury St. Edmonds)	Anglia	FP	A cyclist was struck and killed at the pedestrian level crossing. It is believed the cyclist had dismounted before being struck, but had not seen the train approaching.
31.05.14	Wharf Road (Hertfordshire)	South East	AHB	A 77 year old cyclist was struck by a train at the level crossing. The cyclist crossed whilst the barriers were down. It is not known if he was aware of the meaning of the tone warning that a second train was coming.
26.06.14	Wharf Road (Hertfordshire)	South East	AHB	A 39 year old pedestrian was struck by a train at the level crossing. The member of the public walked around the lowered barriers despite the barriers and warning lights operating correctly.
27.08.14	Fishermans Path (Sefton)	London North West	UWC	The train driver reported striking a girl with a dog on the user worked level crossing. The pedestrian chased her dog onto the crossing when it ran through the vehicular gate. Both were struck by an oncoming train.
03.09.14	Dibleys (Kent)	South East	FP	A 20 year old was struck by a passenger train at the crossing. Early morning conditions were foggy and the user may have been wearing headphones which contributed to the accident. The driver was not required to sound the horn due to the night time quiet period.

Network Rail (Essex and Others Level Crossing Reduction) Order

08.09.14	Clappers Lane (Ferring, Sussex)	South East	FP	The 17 year old male, with hood up and on mobile phone, was struck on the crossing. The driver reported he made no attempt to move upon train approaching. The coroner deemed the incident to be 'accidental'.
16.09.14	Lightcliffe Golf Course Wyke (Calderdale)	London North East	FP	A 67 year old pedestrian walking his dog was struck by a passenger train at the crossing. The user was unaware that there was a second train coming and crossed immediately after one train had passed and was struck by another.
03.11.14	Gipping Road (Suffolk)	South East	CCTV	A man was killed when he was hit by a train on or near the level crossing on Gipping Road, Suffolk.
04.11.14	Sandhill (Cambridgeshire)	South East	AHB	An 86 year old pedestrian was struck by a passenger train at the level crossing. The crossing was working correctly at the time of the accident.
13.12.14	Hipperholme (Calderdale)	London North East	FP	A 16 year old girl was struck by a passenger train while sitting on the crossing in the very early hours of the morning. She was reported to have been listening to a mobile device with a friend and was not expecting trains to be running at that time. The train driver did not sound the horn due to the night time quiet period.
29.12.14	Hipperholme (Calderdale)	London North East	FP	A woman's body was found near the level crossing after being struck by a train. It is believed she gained access to the railway from the crossing.
08.02.15	Glebe Way (Kent)	London North East	CCTV	A 14 year old girl who knew the crossing well and was a regular user, was struck by a passenger train travelling at 50 mph at the level crossing. She was listening to music on her iPhone at the time.
08.04.15	Cannons Mill Lane (Bishop's Stortford)	Anglia	FP + MSL	A pedestrian was killed when he walked out in front of an approaching train at the level crossing. He seemed to momentarily freeze on seeing the approaching train, then tried to move out of the way at the last minute, but was fatally struck by the train. Weather conditions were reported as foggy.
08.10.15	Foxton (Cambridgeshire)	Anglia	CCTV	A 73-year-old female was killed when she was struck by a train on the A10 level crossing in Foxton.
03.01.16	Marston AHB (Bedfordshire)	London North West	AHB	The driver of a car which weaved around the lowered barriers at Marston AHB collided with a passenger train.
21.01.16	Fishermans Path (Sefton)	London North West	UWC + FP	A 54 year old man stepped out in front of the train and was fatally injured by the collision.
01.02.16	Weston Milton (Somerset)	Wessex	FP	A 14 year old boy was struck by a train and killed on the pedestrian crossing in Western-super-Mare.
15.02.16	Tide Mills (Sussex)	South East	UWC-T + FP	A train struck a man on the single line near Seaford. He was reported to be wearing a coat with the hood up; distraction was recorded as a potential factor.
26.02.16	Grimston Lane (Essex)	Scotland	AHB	A man was killed at the Markle level crossing, near East Linton.
27.02.16	Markle (East Lothian)	South East	CCTV	A man was struck by a train after attempting to cross after the barriers had been lowered. CCTV footage showed that 2 pedestrians had pushed through the lowered barriers.

Network Rail (Essex and Others Level Crossing Reduction) Order

28.02.16	Shoreham Station (Sussex)	South East	CCTV	A 20 year old man was killed at Shoreham-by-Sea after being struck by a train at Brunswick Road level crossing in the early morning.
03.04.16	Brunswick Road (Sussex)	London North West	FP	A man who walked out in front of, and was struck by a train on the level crossing between Manor Road and Hoylake station, later died of his injuries.
04.04.16	Melrose Avenue (Wirral)	London North West	MCB-OD	An 89 year old local man was killed after being struck by a train at the crossing, at Marlston cum Lache, near Chester.
05.04.16	Balderton (Chester)	South East	MCB-OD	A man died after being hit by train at Mortlake station level crossing between Richmond and Barnes.
11.04.16	Mortlake (Gtr London)	Anglia	AHB	A person was killed on the Level Crossing at Keswick.
11.04.16	Keswick (Norfolk)	Anglia	AHB	A pedestrian was killed when struck by a train on the Cringleford automatic half-barrier level crossing near Norwich.
03.05.16	Cringleford (Norfolk)	South East	FP	A man in his 30s was struck and killed by train on the level crossing at 6.30am.
06.05.16	Stone Crossing (Dartford)	Scotland	MCB	Man in his 50s died after being struck by a train in Broughty Ferry Level Crossing, Brook Street, at 1.50pm.
19.05.16	Broughty Ferry (Dundee)	LNW	FP	Fatality at 5.46; man struck by train and killed, body found near Ladywood Public Footpath Level Crossing.
09.11.16	Old Stoke Road (Buckinghamshire)	London North Western	FP	A 31 year old cyclist was fatally struck by a train whilst cycling across the level crossing.
07.02.17	Frampton (Gloucestershire)	Western	UWC(T) +FP	The single authorised user was given permission to cross by the Signaller, after the user stated the train in section had already passed the crossing. Tragically, he was incorrect and a passenger train collided with his vehicle on the crossing, fatally injuring both the user and his dog.
06.03.17	Stokeswood (Craven Arms)	Wales	UWC+FP	The 82 year old authorised user was struck by the Manchester to Milford passenger service when she walked into its path on the footpath crossing.
24.03.17	Nowhere (Kings Lynn)	Anglia	FP	A 50 year old woman crossed into the path of an approaching passenger train and was fatally injured. She was accompanied at the time though there was no reported injury to the 2 nd party. The woman's first language was not English so may have misunderstand the level crossing instructions.
13.04.2017	Low Moor Farm (Weeton)	LNE	FP	A person was struck by a train at the Low Moor Farm LC near Weeton at 4.27pm.
17.05.17	Nature Reserve (Attenborough)	LNE	FP	A 58 year old man was fatally struck by a passing train as he crossed this East Midlands bridle crossing. Evidence suggests that he may have seen the train approaching, but misjudged the distance and speed of the approaching train.
01.06.17	Trenos (Llanharan, Rhondda)	Wales	FP	An 87 year old lady was struck by a passing train as she stood on the crossing deck.

Network Rail (Essex and Others Level Crossing Reduction) Order



31.07.17	Tempsford (Sandy, Bedfordshire)	LNE	CCTV	A 56 year old male pedestrian from Cambridge was fatally injured when struck by a train at Tempsford at 6.15pm
05.08.17	Trees (Gravesend, Kent)	South East	FP	A 57 year old man died at the public footpath level crossing off Mark Lane when he was struck by a train at 7.15am
06.08.17	Alphington (Exeter)	Western	FP	A 75 year old man was struck and killed by a freight train at this footpath level crossing at 8.30am.
06.08.17	Attenborough (Nottinghamshire)	LNE	CCTV	A woman was fatally injured when hit by a train at the Manned Barrier level crossing at 9.20am.
16.08.17	Coundon (Coventry)	LNW	CCTV	A woman was struck at the full barrier level crossing at 1.15am.

TAB 3

Glossary of Terms

ADL	Arthur D Little
AHB	Automatic Half Barrier crossing
ALB	Arms-Length Body
ALCRM	All Level Crossing Risk Model
AOCL	Automatic Open Crossing, Locally monitored
BTP	British Transport Police
CCTV	Manually Controlled Barrier crossing operated remotely via Closed Circuit Television
CP4	Control Period 4: (2009 – 2014)
CP5	Control Period 5: (2014 – 2019)
DfT	Department for Transport
EU	European Union
FP	Footpath crossing
FWI	Fatalities and Weighted Injuries
LCM	Level Crossing Manager
LED	Light Emitting Diode
LNE/EM	London North Eastern & East Midlands Route
LNW	London North Western Route
MCB	Manually Controlled Barrier crossing
MCB-OD	Manually Controlled Barrier crossing with Obstacle Detection
MSL	Miniature Stop Lights
MSV	Mobile Safety Vehicle
NPS	National Policy Statement
NR	Network Rail
NRA	Narrative Risk Assessment
NTQP	Night Time Quiet Period

Network Rail (Essex and Others Level Crossing Reduction) Order

ORR	Office of Rail and Road
POGO	Power Operated Gate Openers
PR13	ORR Publication – “Periodic Review 2013: Final Determination of Network Rail’s outputs and funding for 2014-19”
RAIB	Rail Accident Investigation Branch
RIDDOR	Reporting of Injuries, Diseases and Dangerous Occurrences Regulations
RLCM	Route Level Crossing Manager
RSP7	ORR Publication – “Level Crossings: A Guide for Managers, Designers and Operators. Railway Safety Publication 7”
RSSB	Rail Safety and Standards Board
SMIS	Safety Management Information System
SRM	Safety Risk Model
SSL	Stop, Look and Listen sign
STE	Safety, Technical and Engineering directorate, Network Rail
TWAO	Transport and Works Act Order
T984	RSSB Research Programme – “Research into the causes of pedestrian accidents at level crossings and potential solutions”
UWC	User Worked Crossing
UWC(T)	User Worked Crossing with telephones